A FOCUS ON PEDAGOGY

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A Focus on Pedagogy: Teaching, Learning and Research in the Modern Academy

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INTRODUCTION

A Focus on Pedagogy: Teaching, Learning and Research in the Modern Academy

This publication is the product of the conference *A Focus on Pedagogy: Teaching, Learning and Research in the Modern Academy* held virtually 2022 based on the following call:

Today the education sector is going through what most commentators see as an unprecedented period of change. The assumption is that in the wake of COVID-19, many standard modes of teaching and learning have changed forever. While that is undoubtedly true and of fundamental importance, many aspects of what we do remains the same. Our need to publish, bring in research funding, and get positive student assessments have not gone away. The knowledge we need to impart, and the mindsets we seek to loosen or develop, remain as engrained as ever. Similarly, long established research areas are still to be explored. Whether it be the environment, learning psychology, social networks, creative practice or design thinking, what we research remains relevant and pressing.

In addition, despite the 'strangeness' of the change around us, some disciplines find themselves in unexpectedly familiar domains. The digital arts, media and communication studies are operating on platforms many see as natural. The proponents of distance learning are employing techniques they had been honing for years. Acolytes of educational technologies are perfecting platforms they have been developing for decades. The effect of the pandemic on our teaching and research then, is far from uniform or wholly negative. Set in this context, this conference reminds us that, in addition to the pandemic, there are other issues at play for educators and researchers today. Asking us to take a step back from the flux we have been in recently, it invites us to discuss both the radical realignments that have been necessary in recent times, and those aspects of our pedagogy that have continued unaffected by remote teaching. Bringing both sides of this coin together, the intention is to better grasp the tenor of teaching and research in today's changing, and increasingly hybrid, academy.

This publication captures the diverse responses that emerged from the event and the variety of ways academics internationally currently operate with today's education sector.

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LEARNING FROM THE EUROPEAN CITY IN ABSENCE

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INTRODUCTION

In this contribution I will share with you, challenged by the covid-19 pandemic, our attempts to adapt a course intended to experience and study the European city in real life, into an online format. I will first introduce the bachelor (undergraduate) course 'Foundations' and the role that the excursion has in the curriculum of architecture at TU Delft. Then I will discuss how the adaption to the pandemic situation in 2020 has resulted in different approaches within the course, and reflect upon them in the perspective of 'travel pedagogies.

Foundations

The excursion to a European city is part of a series of four courses in the Bachelor curriculum in which the *Foundations of Architectural, Urban and Landscape design* are taught.[1] The *Foundations* series offers lectures on fundamental notions and seminars in which the students learn to work with analytical methods to study canonical precedents. The course thus provides students with tools to understand architectural projects, relate them to theoretical notions and to build up a disciplinary frame of reference.

As fourth module of this Foundations course, situated at the end of the second year in the Bachelor curriculum, the excursion to a European city trip is the closing highlight in which the physical world is experienced consciously through the lens of design. Simultaneously, this excursion is an important social event in the students formation: the collective experience in which students and teachers explore the city together is a long lasting memory and important reference.

In the course, the city is understood as a part of a manmade world over time, in connection to geographical conditions. Visiting a city shows how societies and identities are shaped by the past and raise the awareness of continuity and connectedness.[2]

To learn to observe and experience the city, the intentional excursion does not only take the students by the hand, but, at the center of the excursion – so to say at the center of this course - is a small on site research project which is prepared, carried out and processed by a small group of students. Of course, the second year undergraduates are still beginners who are in the process of learning what to look at and how to discover architectural and urban qualities in buildings and public space consciously. But, after studying precedents through analytical drawing and modelling in the previous Foundation Courses, we familiarize our students with other kinds of city observation techniques which are related to epistemological positions. The typo-morphological toolbox is expanded to phenomenological sensorial experience, the perspective of use and interaction between buildings and people, and, the city as a reflection of society over time.

Figure 1. Reshuffling trips to the European Cities through Covid 19 Virus April 2020

The city in absence

Less than one week before the Architecture Foundations 4 started, in March 2020, the Covid-19 virus deprived us from taking our 330 students and 26 tutors abroad, to the cities of Budapest, Torino, Copenhagen, Edinburgh, Athens, Hamburg and Berlin. At the very last minute all booked travels had to be cancelled and the well prepared course, that was supposed to be taught by 26 teachers in group studio seminars, had to be converted into a full remote online version instantly. It turned out we were not allowed to take our students anywhere at all, not even in de Netherlands. The online platforms Zoom and Teams were installed and from this moment we –teachers and students, literally and figuratively were bound busy 'behind the screen' online. How could we deal with this sudden upside down perspective?

City immersion

The challenging question became if and how it was possible to approximate the original main learning objective of 'city immersion': the sensorial experience of place, scale, monuments, public life, backsides, culture, food, nightlife and so on. Would it at all be possible to replace the experience of a city live into remote online?

Even if it became impossible to visit the cities, the original course structure was kept: students were divided over 7 European cities; each 'city group' was taught in 4 groups by 4 teachers; each representing a different domain: history, architecture, urbanism and heritage. We more or less kept the timeline in which the first two weeks are to prepare and inform, the third fulltime excursion week to experience the city and the fourth and fifth week to report, contextualize and reflect.

Usually the teams of city-teachers set a direction and students can bring in their own interests, within the framework of the set learning goals of the course. This allowed for the students to get acquainted with different perspectives on architectural and urban analysis, such as typo-morphological or the phenomenological approaches. Also in this case, we asked the teams of teachers per city to find their own solutions to this challenge.

HOW TO MIMIC THE REAL LIFE EXPERIENCE OF A CITY VISIT?

Some teachers relied on historical and typo-morphological research methods to study the representation of a specific building; in the lockdown situation they held on to a conventional academic literature study. Their student groups developed valuable and thorough papers, and asked the students to explain a project through an online on site presentation. In these cases, though the general learning goals were addressed, the approach did not compensate for the real-life experience of the city and the energy of the social event of a group excursion.

While the teams Berlin and Edinburgh decided to study the intended cities from home, making use of the available information to other than the real life visit; team Copenhagen decided to move back to a Dutch city completely and study projects designed by foreign architects in The Hague, in the expectation that student could at least individually visit the city and the studied projects.

The teams Athens, Budapest and Turin decided to add a Dutch city or situation, with the expectation that comparison of a city nearby supported the flawed version of the remote online experience.

Other studios stepped away from the idea of excursion and narrowed the scope to a specific theme or method to experience the city, like the studio by Harm Scholtens which studied Gordon Cullen's notions concluded from the serial vision studies by developing similar series of descriptions and perspective drawings for Dutch urban situations.

Other studios compared and projected the intended city to a situation around the student's direct living environment. In Amy Thomas' studio, students made a visual atlas and an audio tour about a neighborhood in Athens in which stories and sounds from the city and home were integrated speculatively. For example, one of the results was a study of the immigrants neighborhood Prosfygika through a map of Amsterdam, provoking strangeness and wonder. A beautiful podcast was the result.

Another studio taught by Mikel van Gelderen challenged students to experiment how to analyze projects in the locked and empty city using improvisation and homely attributes to rebuild and represent projects. This resulted in inventive modes of presentation, such as a study of the configuration of housing types built of books and a project exhibition on the attic of a parent's house.

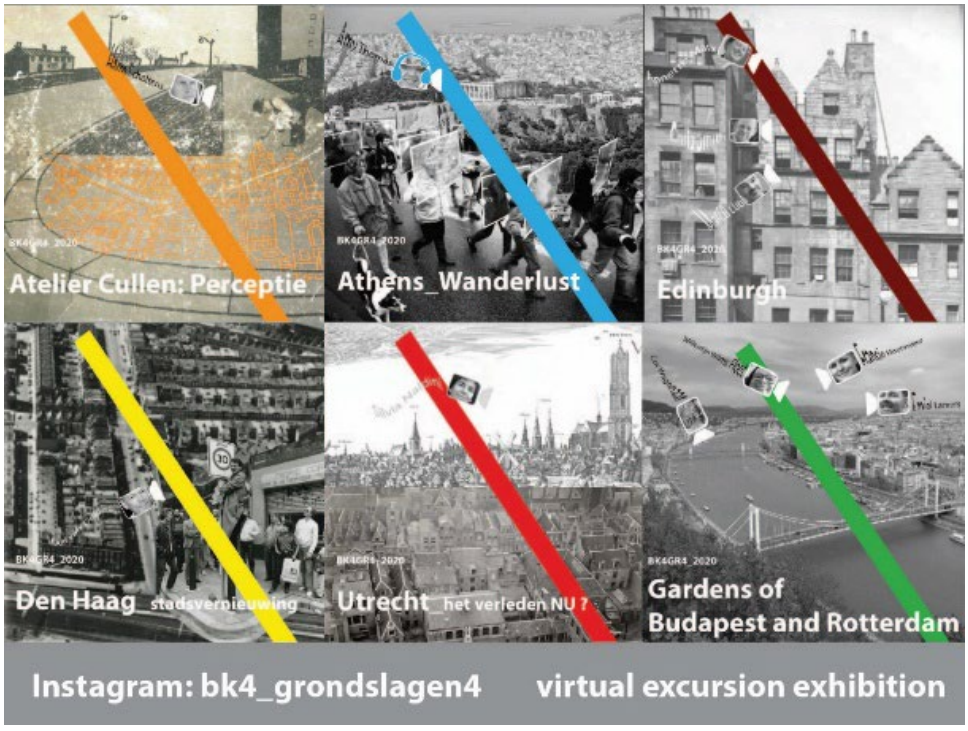

Figure 2. A selection of different approaches to study the city remote online composed by the author

City as a person

The final strategy I present here uses the idea of 'city as a person' to stick as close as possible to the idea of excursion, to imagine the city, mimic and invent as many actions as possible to experience the city alternatively and try to awake the feeling of city immersion. This group, that focused on Budapest, explored the use of remote online instruments in multiple ways.[3]

The city was walked in Google Street View: what usually is a 10 Kilometers straight section through the city that takes a day could be densified into two hours and for 60 focused students at once. But of course students and teachers missed movement, smell, sound, time and space to feel amazed, overwhelmed, or tired. And certainly, they missed the companionship that is generated through such an intensive collective walk in reality.

A theatre program was composed of music, dance and film in its best performances; explanations of the architecture and history of music in Budapest were included, which is impossible to combine altogether in real life . We also included local architects and city planners and invited them to join our online sessions. The Hungarian architect Zoltán Erő who designed the new Metro 4 line took us on an underground expedition from Budapest.

To behave like locals we collected a number of popular Hungarian television series with the help of a Hungarian academic colleague.[4] We audio-recorded fragments from Hungarian novels.

The intended Budapest onsite research project to be carried out by the students was centered around community gardens, a topical phenomenon to incite sustainable social inclusive and green healthy neighborhoods. These gardens were used as a vehicle for studying particular urban identities from the 19th century courtyard block tissue, until communist industrially produced *Plattenbau*, and European Union supported transformations of city center urban space created recently.

Because we expected students to be able to visit Dutch cities individually we also added Rotterdam as a city of investigation next to Budapest. In the excursion (week three in the five-weeks schedule) we assigned our students to move into the life of famous Budapest and Rotterdam civilians (as spitting images) who are in the collective memory of the city and imagine a series of activities on a Saturday. Imagining the city through city heroes allowed to bridge the real and the imaginary in a playful, but serious way: history; daily and public life are related to physical structures. Via the characters living in a particular place it is possible to question the city as a person itself, how residents interact with their city, like in literature.

The city heroes were all alive and living in the community garden study area. Amongst them important city planners, architects, captains of industry and also writers, painters, musicians, photographers and sportsmen. A provisional day-program and different kinds of observation techniques were assigned to practice; students were challenged to consult resources in Budapest to get their explorations done, like consult online real-estate agencies to select a proper apartment plan, read a local newspaper online, study expressions of communality like statues and murals online, consult the public transportation systems, cook Hungarian food.

Students teamed up in duo's that met over the day online to carry out joined tasks to enhance social interaction, peer feedback and fun. We tried to think of assignments in which training drawing skills and analyzing the city got together with creative and playful imagination.

Breakfast was imagined in a Bow Wow Window-scape of the apartment where the city hero lives,

a Jan Rothuizen Softmap and a George Perec Species and Spaces inspired writing exercise were programmed; for 10 o clock students had to set a fitness-detour around the house of the hero, to be documented through Gordon Cullen's serial vision and an Edmund Bacon's way of mapping sequences of visually connected urban space. For daily shopping at 11 they had to visit a local market hall, supermarket or convenience store within 20 minutes walking from home to be mapped using Venturi's Las Vegas strip analysis and a Delft method to split architecture and daily life. For noon they had to identify a pleasant sunny lunch setting in the nearest park, for which the hero from their

counter city was invited. In the afternoon students had to plan an activity 10 kilometers from home using public transportation only, transferring means of transport three times and documenting a complex transport hub.
Another assignment that turned out to be successful especially in social terms was a one-day design competition for a community garden fence, done in city-hero-groups.
Of course cooking Hungarian and visiting a Ruin-bar (a contemporary phenomenon in which buildings waiting for restauration are used for nightlife) was were the excursion ended.
The presentations of all City hero life explorations at the end of the excursion week felt like being taken to Budapest.
One of the final outcomes of the course is a set of personal made Postcards, a medium par excellence to express personal attendance in the city. Every group of students showed their findings and interpretation of the studied site and buildings from a particular perspective visually and in text: architecture, urbanism, lived city and healthy city.

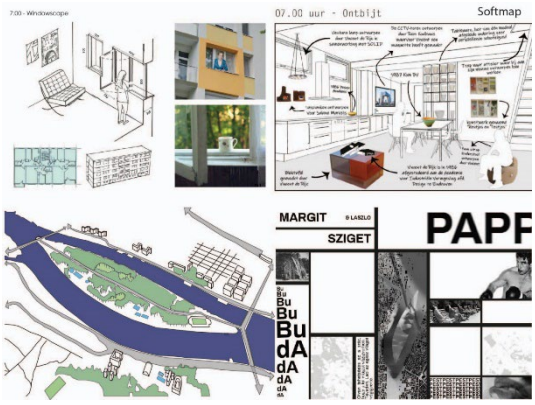

Figure 3. Virtual remote online excursion student work.Top left: Bow-Wow Window-scape breakfast scene by student Hein van der Helm; Top right: Rothuizen Softmap breakfast scene by student Ries Schouten; Bottom left: Postcard: Urban setting Margit Sziget by student Merijn Jansen using Palmboom; Bottom right: Postcard: Lived Margit Sziget by student Melati Veerman using Moholy Nagy

STRATEGIES TO STUDY THE CITY REMOTELY

To evaluate how teachers and students dealt with the Excursion course online I decided to make an online Instagram Exhibition bk4_grondslagen4 in which a selection of the work is on display.
The shift to the remote online version unleashed creativity amongst teachers and students: new imaginary representations replacing the experience of the city appeared. Analyzing the program and results of 24 studios I found three valuable strategies or concepts to redefine site in a city in absence:
1. The city through home: improvisational analysis methods to imagine the city through creation like models, exhibitions and installations. Here questioning the outcome of the course was leading.
2. The absence of the city: In this strategy the site of investigation is studied by comparison, mimicking, layering and synthesizing with well-known equivalents. Here questioning the analysis method was leading.
3. The city as a person: imagination was based on ways of investigating and pretending the city via characters.
Finally, it is remarkable that even though the limitation to internet was a challenge, it was also Internet that saved the course: Besides more and more information is available online, new ways to get to know the city via online sources were discovered in this course. Conventional sources for architectural research of the built environment were complemented by websites to investigate

ordinary life. Exploring online local resources confronted students with the organization of the city, but also the foreign language, sounds, images, signs and symbols to imagine how people inhabit their city are valuable; it incites and activates imagination to get to know the city as a place to live; this was addressed better than in previous editions of the course.

REFLECTION; KNOWLEDGE, IMAGINATION, EXPERIENCE

Imagining the city is at the heart of all three strategies to experience the city alternatively.
What do scholars say about the role of imagination in travel pedagogies?
Alain de Botton in *The Art of Travelling* opens the floor to voices stating imaginary traveling has many advantages: less hassle, pennywise, and it enhances creativity. [5] But, his characters were all 19th century writers and painters, except for John Ruskin architect and art teacher around 1860 who encouraged everybody to discover beauty by close observation and drawing, no matter talent; and then, De Botton unfolds the myriad qualities and sensations of live traveling which cannot be replaced.
The extensive overview to conceptualize traveling and Architecture by Traganou and Mitrasinovic includes a section on 'immobility and imagination'; [6] they list multiple architects fascinated and influenced by foreign places they never visited, and furthermore, they draw attention on the common architects fascination for the imagined world like for Italo Calvino's Invisible Cities from 1972. As the explanation they quote Mark Wigley stating that architects are essentially foreigners: 'architecture is precisely the act of turning the world into a foreign place that makes the local strange'. [7] In other words, imagination is core business and is very valuable in the formation of architecture students.
Kay Bea Jones promotes a critical approach to traveling experience as a process to acquire knowledge from visual and spatial cognition. [8] She attacks the common excursion practise of 'confirming observations by authorities' like architecture historians or critics and claims new meaning will only be defined and discovered if the process of seeing is related to real life: subjective, intuitive, imprecise, nonlinear, open; and, in the case of education: intentional, insightful and creative.
The strategies to imagine the city take pedagogical principles regarding explorative readings of the site as a place to be and live into account. However, studying from home is a static and amputated process; discoveries in the course are merely based on creative representations of structured exercises (which, by the way, is confirming that creation is knowledge based), not on experiential notions like distance, the unexpected, excitement, discovery, broadening horizons and so on.
So, despite all the effort in searching for innovative alternatives to experience the city online, and discovering the value of imagination, we cannot wait to go again. 'In the real world there is always much more than to be imagined beforehand'. [9]

NOTES

[1] The BSc curriculum at the Faculty of Architecture at the Delft University of Technology offers a so called 'broadly oriented' program, preparing students for a MSc in several specializations: Architecture, Urbanism, Landscape Architecture, Geomatics. The BSc-series *Foundations of Architectural, Urban and Landscape design* is composed of four 5 ECTS courses taught in year one and two. All the four courses address 'notions' to communicate about architectural, urban and landscape design; its long term development; 'project knowledge'; and, skills to analyze these projects. The series *Foundations* is supervised by Prof. dr. ir. Klaske Havik; Foundations 1 and 2 are coordinated by dr. ir. MaartenJan Hoekstra; Foundations 3 and 4 are coordinated by dr. ir. Willemijn Wilms Floet.

[2] Aldo Rossi, *The Architecture of the City* (Cambridge, Mass: MIT Press, 1991), 57-59.

[3] This studio was tutored by a team consisting of dr. ir. Willemijn Wilms Floet (Architecture) dr. Fransje Hooimeijer (Urbanism), ir. Emiel Lamers (Heritage) and prof. dr.Cor Wagenaar (History).

[4] Regina Balla, BME Budapest.

[5] Alain de Botton, *De kunst van het reizen* (Amsterdam: Amstel Uitgevers, 2002, 2009), 17-34.

[6] Jilly Traganou and Miodrag Mitrašinović, *Travel, Space, Architecture* (Milton: Taylor & Francis Group, 2009), 10-11, https://ebookcentral-proquest-com.tudelft.idm.oclc.org/lib/delft/detail.action?docID=438448.

[7] Jilly Traganou and Miodrag Mitrašinović, *Travel, Space, Architecture* (Milton: Taylor & Francis Group, 2009), 11, https://ebookcentral-proquest-com.tudelft.idm.oclc.org/lib/delft/detail.action?docID=438448.

[8] Kay Bea Jones,. "Unpacking the suitcase; travel as a process and paradigm in constructing architectural knowledge", in *The Discipline of Architecture*, ed. A.J. Piotrowski et al. (Minneapolis: University of Minnesota Press, 2001), 127-157.

[9] Alain de Botton, *De kunst van het reizen* (Amsterdam: Amstel Uitgevers, 2002, 2009), 21.

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MINDFULNESS AND MEDITATION – SELF-CARE AND BEING DIGITAL IN THE ARTS

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INTRODUCTION

Maybe you feel like most of all (art) students: Do you feel drained from all the digital input you are supposed to deliver, and all the digital output of others you consume? How does this affect your own creativity? In these digital times, do you also ask yourself how to deliver content, catch up with everyone, motivate yourselves, inspire others, stay creative, stay on track, stimulate discussion, be high-level intellectually, and deliver artistic excellence? All at the same time? Online? Wow. That is a lot. We cannot turn ourselves into multi-tasking cyborgs.[1]

In the last years, I taught graduate courses called "Mindfulness and Meditation – Self-Care and being Digital in the Arts." We studied self-care methods. We learned ways to strengthen ourselves energetically. We identified the changes we individually want to see in this world – aka what to focus on and what to let go of. We expanded digitally, but only in directions we actually want to grow. All with the question: How to stay sane in the digital world as a creative human being. I am excited to share and contextualize with you the key points I identified, during my graduate courses and the intense last years of digital teaching and learning in the creative environment of an art school: Green up your life; The Healing Power of a Neutral Space; Do not miss the boredom; Get still and listen deeply; Get back into your body; Get Inspired: What brings you joy?; Connect to your buddies.

GREEN UP YOUR LIFE

It might sound counter-intuitive, but to be more digital-savvy it helps to spend more time in the non-digital world. I know, traveling to Boa Boa, or other dreamy places, was a difficult option in the past years, and probably still is, for most of us. Yet going outside changes our mood significantly. In a study, conducted with 20,000 people at the European Centre for Environment & Human Health at the University of Exeter, Matthew White and his team, found out, that human beings who spend two hours a week outside in a green environment - the minutes spaced out over the week, or in one go - would report more likely mental well-being than those who did not go outside.[2] This might not be thrilling news. Yet it is a great reminder. Especially now that we are stuck in an online conference again. To be happier and more productive in the digital world, we need time in the analog world of nature.

Example

At our institute, we do a lot of applied research in the field of promenadology: learning experiences while walking. Maybe taking my talk outside and listening to me as a podcast might be a good idea.
Simple Take Away: Go Outside Regularly.

THE HEALING POWER OF A NEUTRAL SPACE

We need more neutral spaces. Spaces we do not judge, and we are not judged in. Social media and the constant call to like or dislike what we are experiencing means stress for our social and internal well-being and might hinder our creative expression. In a study with young adults, led by psychologists from the University of Austin Texas, and the University of Rochester, the researchers found out, that being rejected or rejecting others, as well as the crave for being liked, causes stress.[3] In the algorithms of either positive or negative reviews, we miss out the comfort of a neutral space. We need unbiased time, time we might experience when doing everyday activities like brushing our teeth, going shopping, or doing the dishes. When we turn learning environments into social media spaces, such as a Moodle and also more contemporary options, we as users aka learners are constantly stopped to ask ourselves: Do I like what I am offered to do here? Do I like my fellow's comment? Do I like or do I not like my professor? Do you know ratemyprofessor.com? In supposedly creative online learning environments, that are designed to encourage us to post and comment on each other, with the same parameters as social media, it is rather difficult to not start the stressful circle of judging and feeling judged. It is almost impossible to sink into a flow state of just doing for the sake of doing.

Example

We use miro boards[4] a lot for shared collection of ideas and project development. That works well, so far.

Take Away

I might be old-school, but I am a big fan of simple tools like TextEdit or Notes, or a good old notepad. Or when meeting digital: Simple Zoom or other meeting tools. No fancy extra tools, no likes or dislikes, no choices, no judging, no drama. Use tools that give you space to focus on what truly matters: the content we want to study together.

DO NOT MISS THE BOREDOM

Boredom has a bad reputation in a society where we train to turn study time into edutainment and being creative into an Instagram account with multiple digits of followers. In an experimental study with 192 students, by Stanislaw Schukajlow from the University of Münster, Germany, it was discovered that problem solving was easier for students after a certain time considered boring.[5] Encouraging times of contemplation and daydreaming can spur creativity.
Already in 1977, Daniel Schubert, found out, that when we give enough time to come up with all obvious answers to problem-solving questions, and then we give us even more time, we come up with more inventive answers, aka creative solutions, to fend off boredom.[6] I might be only speaking from my own teaching and learning experiences, but my urge to overload digital teaching with thematic input, pedagogical subtleties, exchange platforms, upload possibilities, video etc. keeps us all very busy, but are the results that much better?

Take Away

For teachers and students, I invite you to keep it neutral, to focus on simple tools. I invite you, to leave enough time and space to come up with unconventional solutions. As a teacher: Do not insert videos, hashtags, like-dislikes possibilities into your courses. The content you are talking about is

enough. As a student: Delete most of your apps, put away the phone while studying, and close your tabs. Allow, yourselves to get bored as if we are back in the 80s.

BE STILL AND LISTEN DEEPLY

Trigger warning, here comes an inspirational Walmart quote, that is still true: The Austrian pianist Alfred Brendel once said, "The word 'listen' contains the same letters as the word 'silent'."
Being silent is a rare find these times. Our digital friends and helpers could be constantly alerting us to click here and check there. This activity is called reacting and not listening. It is difficult, but possible to turn off all signal sounds and banners, get still, maybe even bored, and start to listen deeply. The practice of deep listening is to just listen to oneself or another person may it be digital or in real life, nothing else. We listen in a silent process to absorb and learn. We listen without assumptions, without judgments, without wanting to speak back quickly in order to get rid of our pre-prepared answer. In an online world, we are conditioned to believe that fast and numerous reactions mean productivityI dare to say, that allowing ourselves to post less, think more, and take our time to listen, makes more space to be creative.
You are the boss of your attention span. You decide what to follow and what to unfollow.
But how do we re-train our quick and reactive one-million-clicks-per-second- digital muscles? By getting still.

Example

Here you see the invitation to a student initiative from our school 20 minutes flight mode during Tuesday lunch breaks. 20 minutes of stillness meditations, we did on-site first, then also online.

As a take-away, try to meditate. Five minutes a day is enough to start with.

No, you do not need a meditation app or to scroll through YouTube to find the perfect meditative video or palm beach meditation background to sprinkle yourself with. Sit down. Set a timer. Calm down. Withdraw your senses from external stimulation. Focus on the pattern of your in-going and out-going breath. This is not an invention of mine, but the technique of Anapansati, a method of the Buddha transmitted for thousands of years.[7] Focusing on the breath, is not easy, but you could make the practice easier for yourself, by focusing on the area where the breath enters your body: Your upper lips, your nostrils, the inside of your nose. Observe how your breath feels, its lengths, its strength, its temperature. Do not control or judge your breath. If you observe your mind wandering off, just simply bring it back to your breath. Repeat daily. Start with 5 minutes. Find yourself refreshed, with more focus and the ability to make relaxed and fruitful decisions towards a more creative than reactive life.

CONNECT YOUR BODY TO THE DIGITAL WORLD

Sounds weird? We are already cyborgs with various digital-physical attachments, such as earplugs and smartwatches. Why not use our digital options for our own benefits? Our bodies are our vehicles to be in this world. According to a study by psychiatrist Hannah Steinberg, exercises always enhance creativity.[8] But going digital often means that we treat our bodies as if swiping, typing, or staring at our screens with tired eyes and frowned brows are the only possible expressive modes our bodies are able to do.
During the corona crisis, one could observe that the number of health apps, fitness YouTube channels, and news about online exercises increased drastically. That part of the lockdown made me very happy. Just look at the British initiative Run For Heroes, which got over one million people to run and raise funds for good causes at the same time.[9] Or simpler apps, like Body-To Brain, developed by the German physicist and coach Claudia Croos-Müller, that invites you to include simple (even secretly executed) exercises into your everyday life.[10]

How about we try some now?
- Let's throw away all our sorrows. With each hand, one after the other. I am sure you are already feeling better.
- Let's sit spreading the legs wide open, crossing our arms behind our necks. You might not always want to do that in public, but at home in front of your screen, why not?
- And the last one, raise your head from your laptops, and smile. What a revolutionary thing to do. But it does supposedly make us feel better right away, right?

Take Away

How about ordering takeaway pizza instead of delivery next time? How about investing some time finding our favorite fitness app? How about connecting to others in your neighborhood to move together? And how about including tiny movements, as we just did (you can even do that in your next online meeting). Listen to your body. Do a body scan. What does my body need right now? Say thanks and give your body what she/he/they truly desire: movement, good food, muscles building, or a nice bath? You could still be digital and listen to a podcast at the same time.

GET INSPIRED BY WHAT BRINGS YOU JOY

For point six I invite you to use the digital possibilities to your advantage. I might contradict earlier statements of myself in this short talk, yet I hereby ask you to enter the digital world full of awe and curiosity, as what it is: an endless box filled with endless possibilities.
In 1972, long before the internet, sports coach Timothy Gallwey, wrote the book The Inner Game of Tennis, which quickly made its way into the coaching world, as we can learn a lot of things from Gallwey, not only about tennis. How about we enter a game – aka online experience – that sets the tone of the game. So how about hooking onto digital possibilities not with fear, but with awe and curiosity instead? And focus not on your not-to-do-list, but on the options that are truly interesting to you? Also, not in the sense of following links, such as "People who bought this book, also bought this book", but links towards what you want to know and find out, just because?
One part of creativity is associations. Sometimes also jumpy ones, that only make sense to the creators. Follow your interest in a distinct Brazilian frog, a Taiwanese way of cooking, or an Inuit name for snow. With the internet, everything is there and available on your fingertip. We do not have to follow the well-trodden paths of the mainstream Internet highways. There are 8 billion people on earth. Follow inspirational sources, that are maybe not liked by a million other people, but liked by you. Follow your curiosity, add a pinch of trust, that all the gathered knowledge on the way, will somehow make sense in your creative process. Amaze yourself.

Here comes a failure example

We set up a shared online learning table with all BA and MA thesis and other projects. The idea was to get inspired and make new associations for new projects. Unfortunately, this project failed. It is hard to re-invent ideas, people in Silicon Valley already had.

Take Away

Ask yourself in all your online activities: Does it bring me energy? Or does it take energy away? Is it truly inspiring, or do I just look at it, because it was the next available click? Reduce all draining undertakings and focus on the things that give you joy and inspiration. Do not subordinate your digital actions to straight learning goals or career moves. When was the last time you looked at bizarre content just for fun? Start today. Free yourself from pressure, comparisons, or rules. Live your life. Also, digital.

FIND YOUR BUDDIES

I do not necessarily encourage you to install yet another echo chamber. There are already too many out there, especially in the digital world. I rather make the point that staying connected or to having accountable buddies online, might make a big difference in how you feel, and how you get further with your creative projects. Health researchers Colin Greaves and Lou Farbus found out in 2006 already, that social activity, even online, make us more creative and content.[11] Even though you are sitting at your desk, or in front of your device all by yourself. You do not have to do everything alone. Sometimes it feels good to be in touch with people, even though you might not have the same opinions on everything. Connect with inspiring, nourishing beings, to share your creative path for a while.

Example

For a week, all students offered various skills to share with each other, from dog training to pizza baking, to VR coding. The initiative "Share your brain" was super social and brought together students who had never spoken a word with each other before.

Take Away

Ask Yourself: What are the tools you like to use? With whom do you like to connect or stay connected? Which digital environments feel nourishing?

CONCLUSION

The first step is to spend a lot of time outside the digital world, in the green, to have more energy to make the right digital decisions. Stay away from social media tools of liking and disliking to make more time and space for non-judgmental, neutral activities and spaces. Do not be afraid of getting bored, digital overstimulation is not the answer for creativity. Refrain from over-activity and trust your instincts instead. Maybe meditation is something for you. Connect to your body by using smart digital tools. Be radically honest with yourself and choose from the endless sites of the internet, the ones that bring you joy. Don't do it all alone, find your buddies to cheer each other on your creative endeavors

NOTES

[1] Patricia MacCormack, *AI (Artificial Intelligence),* (Rosi Braidotti, Maria Hlavajova: Posthuman Glossary, London, 2018), 21-11.
[2] Mathew P. White, Ian Alcock, James Grellier, Benedict W. Wheeler, Terry Hartig, Sara L. Warber, Angie Bone, Michael H. Depledge and Lora E. Fleming, *Spending at least 120 minutes a week in nature is associated with good health and wellbeing* (Sci Rep 9, 7730, 2019), https://doi.org/10.1038/s41598-019-44097-3.
[3] Hae Yeon Lee, Jeremy Jamieson, Jarry Reis, Christopher Beevers, Robert Josephs, Michal Mullarky, Joseph O'Brien, David Yeager, *Getting Fewer "Likes" Than Others on Social Media Elicits Emotional Distress Among Victimized Adolescents*, (Child development. 91, 2020), 10.1111/cdev.13422.
[4] Miro software, miro.com, accessed April 10, 2022.
[5] Stanislaw Schukajlow, *Is boredom important for students' performance?,* (Prag: Proceedings of the Ninth Congress of the European Society for Research in Mathematics Education, 2015), 1273-1282.
[6] Daniel S.P. Schubert, *Boredom as an Antagonist of Creativity*, (Journal of Creative Behavior, 1977).
[7] Jim Drobnick, Jennifer Fisher, *In Nirotishi Hirakawa´s Garden of Nirvana*, (Jim Drobnick: The Smell Culture Reader, New York, 2006), 323.
[8] Hannah Steinberg, Elizabeth A. Sykes, Tim Moss, Susan Lowery, Nick LeBoutillier, Alison Dewey, *Exercise enhances creativity independently of mood*, (Br J Sports Med: 31, 1997), 240-5. doi: 10.1136/bjsm.31.3.240.
[9] *Run For Heroes*, https://runforheroes.org.uk, accessed April 10, 2022.
[10] Claudia Croos Müller, Die BODY 2 BRAIN CCM® Methode, https://www.croos-mueller.de/bodytobrainmethode.html, accessed April 10, 2022.
[11] Colin Greaves and Lou Farbus, *Effects of creative and social activity on the health and well-being of socially isolated older people: Outcomes from a multi-method observational study*, (The journal of the Royal Society for the Promotion of Health, 2006, 126), 134-42.

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Hae Lee, Yeon and Jamieson, Jeremy and Reis, Jarry and Beevers, Christopher and Josephs, Robert and Mullarky, Michael and O'Brien, Joseph and Yeager, David. "Getting Fewer "Likes" Than Others on Social Media Elicits Emotional Distress Among Victimized Adolescents." *Child development*. 91, 2020, 10.1111/cdev.13422.

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DESIGN PEDAGOGIES OF CARE: (GENTLE) RESISTANCE FOR EXHAUSTED TIMES

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INTRODUCTION

We are at a critical moment in the history of our planet: a time of graphs with 'hockey-stick' curves that represent accelerating rates of change to a multiplicity of systems with which architecture and urbanism have been implicated; changes that need urgent responses; changes which present implications for the way we teach architectural design. Environments are damaged and inequalities are widening. Many people are hunkering down in retreat from a world that seems unsafe. Others are on the move, pushed by disasters and lured by the hope of something better elsewhere. Architectural, urban and interdisciplinary theorists have called these "exhausted" times.[1] Exhaustion demands new approaches for teaching to empower our students to believe that they can act in the world to effect change.

Graphs of the Great Acceleration[2] focus on scales of phenomena and speeds of escalation that are impossible to grasp: global population, urbanization, carbon emissions, and resource use amongst other things. Anna Tsing, Heather Swanson, Elaine Gann and Nils Bubandt argue that they are best understood through immersion in small rhythms.[3] We can see the effects of exhaustion in the changing patterns of the weather each season; in the personal stories of dislocation; in the rising prices in the supermarket. Wicked problems can be similarly nested in smaller responses. Designs can make local changes to real peoples lives. Orientating students' efforts to small stories as we scaffold their acquisition of core architectural design skills allows them to find ways they can imagine contributing to new futures.

This paper is a reflection on an approach we have taken in redeveloping an architecture major in an undergraduate degree at an Australian university over the past decade with these concerns in mind. The first author was the undergraduate architecture pathway coordinator. The second author coordinates and developed the curriculum for the first-year design studio. This paper focuses, in particular, the first studio in a sequence of five that students take over their three-year degree. Studio Alpha is a 12-week studio that has up to 320 student enrolments, 35-37% of whom are international students, spread across 20 studio groups

PEDAGOGIES OF CARE

The approach we have adopted is best described as a pedagogy built around theories of care. "Caring" has been broadly defined by political theorists Joan Tronto and Berenice Fisher as "everything we do to maintain, continue, and repair our 'world' so we can live in it as well as possible."[4] As Angelika Fitz and Elke Krasny point out, architecture and urbanism are central to this process.[5] Architecture

enables humans to live in the world as well as possible. Meanwhile the spatial and material practices that architects employ directly affect whether or not environments – both immediate sites, distant environments and other subjectivities that are linked through global flows of materials, money and labor – are maintained and repaired, or damaged and degraded. Architects can no longer afford to simply design with aesthetics in mind. We must equip our students to consider the broader network of care relations in the environments in which they intervene can support.

We are indebted to María Puig de la Bellacasa for the structure of this paper. She assembles her discussion on the ethics of care around three themes: "Assembling Neglected 'Things'", "Thinking with Care", and "The Politics of Speculative Thinking." The first section of this paper describes the multi-disciplinary context of the first half of the architecture pathway which demands students tackle scales, concerns and environments often neglected in the early years of an architectural education. It also describes the neglected stakeholders and programs that have been assembled for the first studio design brief which challenge students to design for a complex suite of care relations. The second and third sections explore techniques for cultivating empathy in students. As Bellacasa notes there is a distinction between the affective response of "concern" and acting with "care".[6] A praxis of care requires concerns to be disobjectified.[7]. Some techniques have worked, others have been less successful. The paper concludes with our reflections of the way we have transformed our pedagogical approach through failures.

ASSEMBLING THE NEGLECTED[8]

Neglected disciplinary skills

There have been discussions about the importance of interdisciplinarity in an architectural education for the past twenty years: for introducing students to techniques for critical thinking via an engagement with the social sciences and philosophy;[9] and to orientate students to the real world, multi-disciplinary context of practice.[10] Much of it focuses on the latter years of education. Steffan Lehman has articulated three potential approaches for preparing students for the world of practice: creating transdisciplinary encounters between students trained in different design disciplines, setting up multi-disciplinary teams within the studio context, and arranging students to provide interdisciplinary consultations for one another.[11] None of these approaches addresses two key deficits we have observed in our students. Architectural educators have been poor at teaching their students to see the complexity and agency of a site, while landscape architecture educators have overemphasised site analysis at the expense of teaching spatial, formal and tectonic skills. Given the challenges of preparing our students to be much more *care*-ful about the worlds they design we have taken a different approach, combining landscape and architectural design for the first half of the undergraduate degree. All students are expected to acquire key skills that are traditionally outside the remit of early years education. A parallel subject equips students with the necessary analogue and digital representational tools.

Neglected programs

Feminist architectural theorists and geographers have challenged architects to think about the broader networks of care within which architecture operates: Diane Ghirado to reconsider '*what is built for whom'*[12] (italics in the original); Margaret Crawford to design urban environments that consider the needs of all stakeholders, whether they pay for them or not, including the homeless and urban poor;[13] and Julie Graham and Katherine Gibson to disrupt architecture from capital and power through identifying "alternative" and "non-capitalist" economies built around care relations.[14] These are often neglected programs in architectural practice, and in architecture schools. These challenges have inspired the briefs for each of the exercises and the major project for Studio Alpha.

Our location in a settler colonial nation that has failed to respect its host nations has inspired the earliest iteration of the first design exercise.[15] The university has only one Indigenous academic in architecture, who was consulted in the development of the project but did not teach it. Instead, students encounter Australia's history of territorial denial and cultural 'othering' of its First Nations people by participating in Billibellary's Walk – a self-guided walking tour that takes in key sites around the University prepared by Indigenous staff in collaboration with local Wurundjeri Elders with textual and audio prompts and tells a story of historic Indigenous presence that is hidden and suppressed.[16] They were asked to engage in a quick design esquisse at the simplest level with interpersonal oral culture by designing a space for a group of people to sit and talk 'that honours the oral tradition of Indigenous people.' This aimed to make students aware that spatial concepts are often culturally conditioned.

Our location in the global south in a nation that extends limited care to people who seek asylum within our borders, has inspired the major assignment. The site is a public urban square situated in a central location in Melbourne not far from the university campus. The brief specifically asks students to design an urban terrain of micro-infrastructure for a group of people seeking refuge in Melbourne that supports emerging socialities and alternative economies within this urban context. It is defined as a 'place for exchange and retreat'. Implicit are questions about belonging, territory, and rights; the importance of spaces for social exchange for civic society; and the need for refuge, but also about non-capitalist notions of exchange predicated on relationship. Lectures and studios are used to teach students, through a focus on the human body in space, that as designers they are the mediators of daily lived experience. That is, design moves have social implications for the way people occupy space at multiple scales. Alongside introducing core disciplinary skills and knowledge, including developing an understanding site, scale, program, form-making, and spatial planning, the imagined, dystopian scenario presents students with a potential consequence of Australia's response to the global refugee crisis with offshore detention and processing.[17]

THINKING WITH CARE

Storying

To imagine the stakeholders for whom they are designing, students are asked to select a protagonist from a given set of four adapted from Ben Rawlence's story *City of Thorns: Nine Lives in the World's largest Refugee Camp*.[18] The characters personalities and physical presence are described in the brief and students are encouraged to consider how these would influence the way they would occupy space and make use of its affordances. Characters include 'Guled', a young, quick, artful leader of a gang of youths; 'Marion', an elderly woman with limited mobility who runs a cottage industry and looks after a 4 year old grandchild; 'Nisho', a 27 yr old woman who is a leader, activist and teacher; and 'Subhi', a 7 year old who lives with his ill mother and teenage brother and described as a dreamer and lover of stories. Students are expected to respond to their bodily needs and specific ways of moving through and occupying space in their design. For example, how the terrain could be navigable by someone that is elderly or how it might be explored by a child? More importantly how could the same pieces of infrastructure be used by different characters for
different purposes?

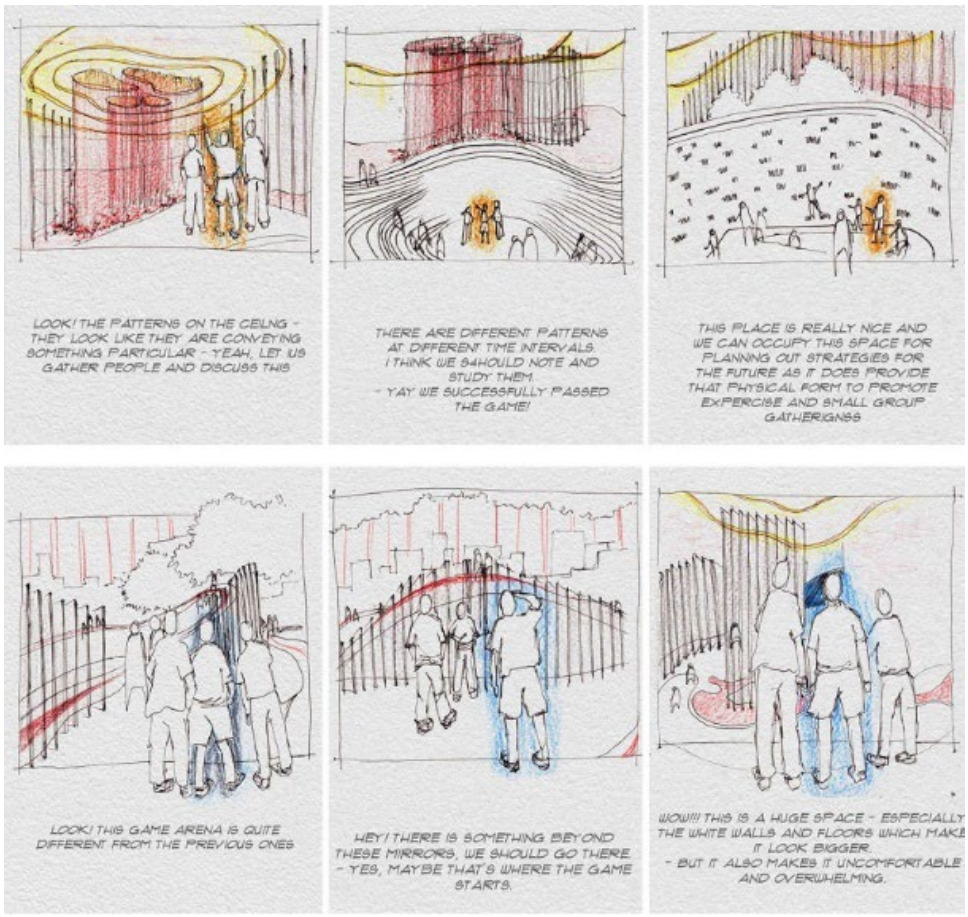

Figure 1. Spatial progression sketches capture narrative arc. By Aastha Prashantkumar Mehta

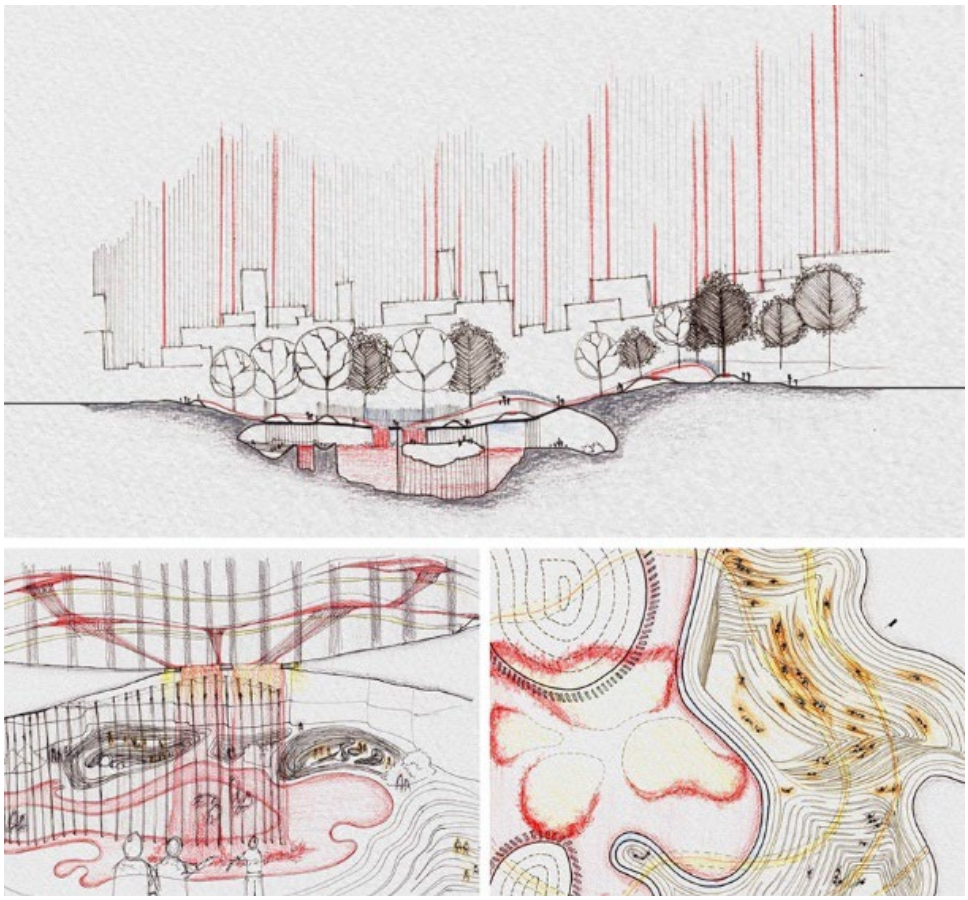

Figure 2. Abyss' is a terrain in imagined dystopian conditions that addresses tenuous citizenship. It is a borderland where the protagonist Guled inhabits and trains by exploring affordances offered by the terrain to compete in survival games. By Aastha Prashantkumar Mehta. Tutor: Dhanika Kumaheri

Inhabiting these characters through storytelling is a process Bellacasa calls 'thinking with' care.[19] It recalls Gilles Deleuze and Felix Guattari's instruction that proclaiming the multiple is not the same as doing the multiple and the work of feminist theorists, like Donna Haraway and Isabelle Stengers, who write speculative fictions. She acknowledges there are contradictions and difficulties inherent in holding difference in mind, but to recognise the 'inevitable interdependency (is) essential to the existence of reliant and vulnerable beings'.[20] During the lecture volunteers from the cohort take it in turns to act out the characters they will design for, inhabiting their difference through walk, posture and gestures. This use of narrative is one part of a process for helping students to cultivate empathy for the strangers who might take refuge and set up social worlds in the urban square they design.

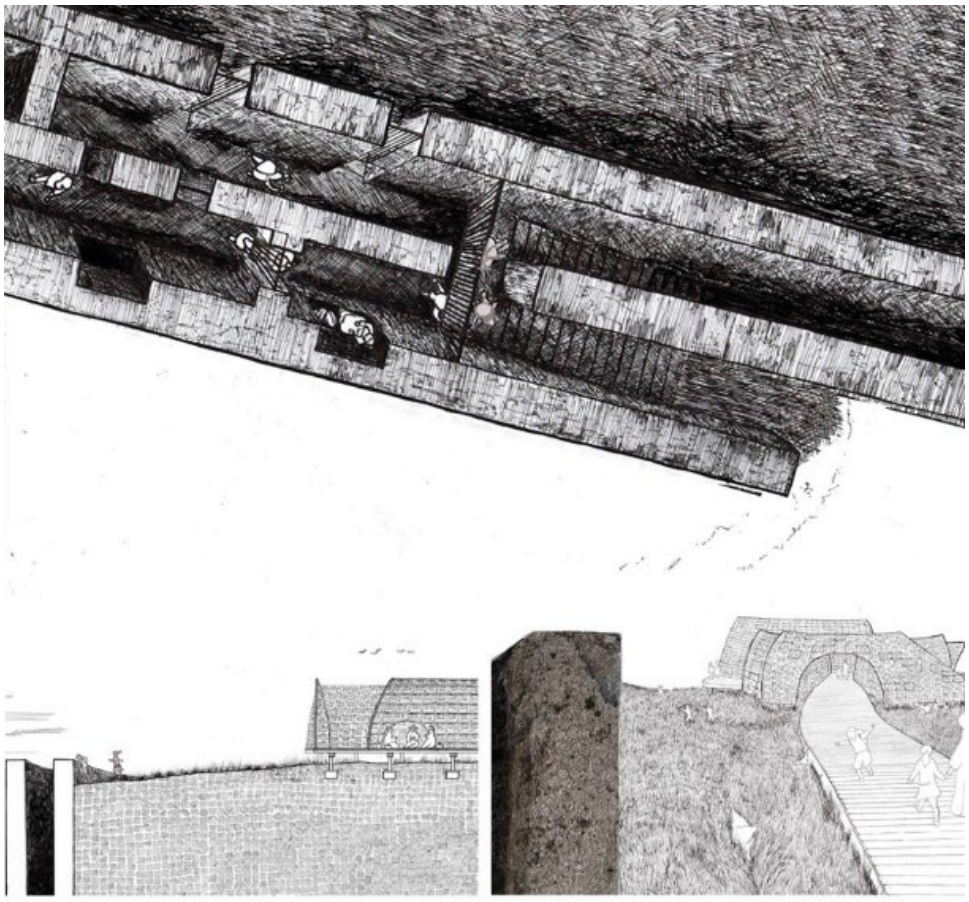

Figure 3. In 'The Divide: To survive is to live in two places' the child protagonist Subhi explores degrees of freedom and security across two counterpoint spaces – one that denotes security and light, the other, dark and subterranean which brings possibilities of transgression but also freedom. By Darko Taleski. Tutor: Sarah Kahn

Cultivating Empathy

While storying enables students to cultivate empathy to some extent, we have found we have needed to develop techniques so that students can move from intellectual concern to affective care. A key step on the journey is building empathy toward people who are different is believing that one's own implicit knowledge from prior life experiences has intrinsic value that others might be interested in. We introduce an initial exercise in the first week of semester, students are asked to observe an environment they have safe access to and sketch bodies occupying space, capturing concepts such as privacy, territoriality, personal space and crowding. We ask students to keep in mind that these are fluid concepts that are subjective and are often culturally conditioned, encouraging them to bring prior knowledge, and draw from personal insights. In reflecting on ways people embody space a new kind of knowledge comes to the fore: tactile, kinaesthetic recollections also recall emotional experiences.

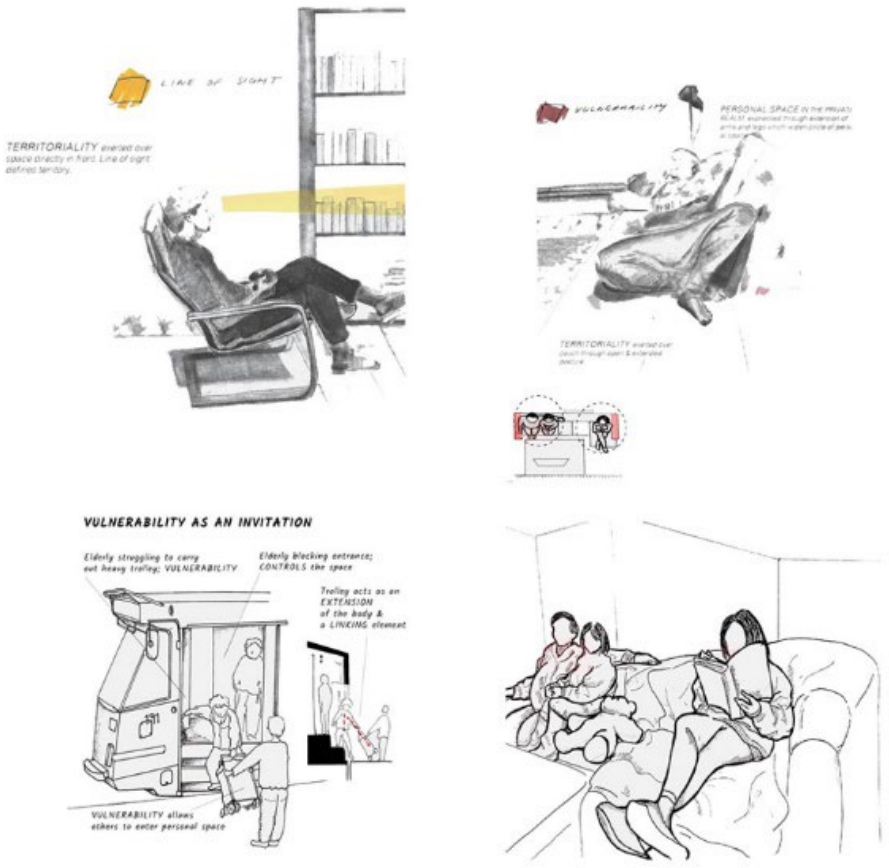

Figure 4. Students observe environments they have safe access to and sketch bodies occupying space, capturing concepts such as privacy, territoriality, personal space, and crowding. Clockwise from top left: Tara Nosko, Tara Nosko, Yixin Chen, Sean Ta

THE POLITICS OF SPECULATIVE THINKING

Oppositional Consciousness

Bellacasa writes, "Speculative thinking belongs to the conceptual nebula of vision. It is also part of feminism's affective power to touch, to nurture political imagination about what the world could be, with its promises *and* threats (Haran, 2001). From a feminist perspective this involves political imagination of the possible…"[21] It is an imagining of multiplicity that is also concomitant with the Chicana feminist theorising of 'oppositional consciousness', or *la facultad*, (as introduced by Gloria Anzaldua and theorised by Chela Sandoval) "…the ability to hold multiple social perspectives while simultaneously maintaining a core centre…"[22] It has been argued this is key to Chicana feminisms ability to form collaborations and political coalitions across diverse, sometimes ideologically incompatible movements.[23] We argue that cultivating this 'oppositional consciousness' can encourage students to hold together differing realities - of different bodily requirements and also multiple social realities that may be incompatible, or even antagonistic.

In the most recent iteration of the first design exercise, we ask students to design an intervention that allows young adults (of their own age) moments of social gathering (both intimate and socially distant), moments of play, and moments of individual respite and escape. We ask them to consider how can this diversity – of loud, quiet, expansive, and intimate spaces – co-exist? Students are asked to explore this through time-based affordances considering different graphic techniques to

communicate the multiplicities. While the major project already asks students to design micro-infrastructure that can afford multiple programs of engagement and bodies of different ages and abilities, this emphasis on differences that are more subtle demands that students consider urban environments as 'worlds' that are thick with inter-dependent as well as oppositional social relationships.[24]

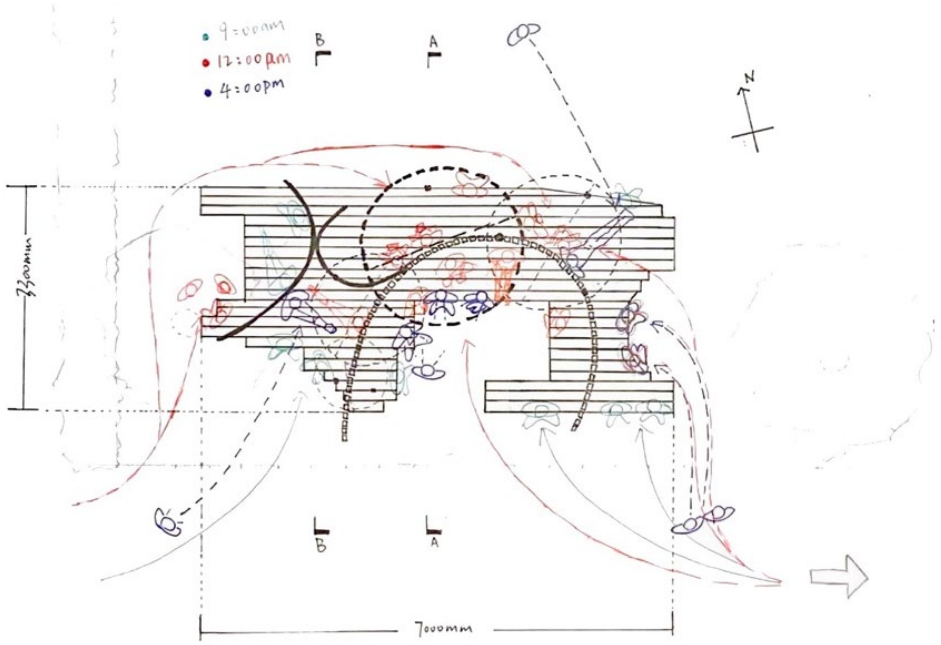

Figure 5. Socio-temporal speculations. Students explore time-based affordances considering different graphic techniques to communicate multiplicity. By Yianxiang Jiao

RESPONDING TO CHALLENGES

Our methods have been effective in part, but we have found that they are not enough on their own. Students can perpetuate practices of 'othering' without new tools for thinking and working. We've asked ourselves how we can leverage our students 'concerns' and what tools do we need to cultivate empathy for 'the other' to equip them to 'care'? Assembling neglected subjectivities is not enough on its own to unsettle practices of 'othering', particularly for undergraduates. The first iteration of the first design exercise in Studio Alpha which attempted to bring the outside in was particularly fraught. There were a number of design responses that were insensitive, with misappropriation of Indigenous art, artefacts and historic photographs including some outright (albeit unintentional) racist responses to Indigenous culture. It was not only staff who were concerned with the responses. One sensitive student, who self-identified as non-Indigenous, articulated fear and discomfort in attempting the task. He cited the lack of understanding of cultural protocols and the challenge of designing for communities without their input within a short timeframe as problematic, asking in an email to the subject coordinator: 'Are we not perpetuating the historic legacy of disregard for autonomy and failing to allow self-determination?'[25]

Given the cultural diversity within the student cohort in each studio we found this somewhat surprising. Surely exposure to difference within would make students more aware and sensitive to issues like this? Philosopher and art historian, Gabriel Rockhill, observed that George W. Bush's administration was the most multicultural and hence 'differentialist' in the history of the United States of America: the first African American Secretary of State followed by the first African American woman Secretary of State; and the first Hispanic Attorney General. And yet each of these individuals

oversaw the some of the most exclusionary politics in US history until Trump came to office.[26] Difference within did not make them inclusive in their policies. The same can be seen within student cohorts. Rather than embrace their own 'hybridity, ambivalence and difference'[27] many can be quick to conform to the hegemonies of their host culture in an attempt to fit in and be accepted. Architectural education often further encourages it through practices of aesthetic indoctrination. But another factor also in play is students' lack of empathy for one another. At an undergraduate level where many are still new arrivals, students can resist sharing from anxiety, shyness and loneliness. This can persist right through a university education, especially when students struggle with language proficiency. It is harder to empathise when you don't know another person's story.

We realised we needed to actively help students to 'think with care' about the subjects for whom they design, whose life experience might be completely unfamiliar; to see that social identity is complex, synthetically assembled; and to become aware of our 'fragile entanglements with one another'. In the second iteration of the design esquisse we directed student attention to key pieces of writing that they could critically reflect on through their designs and to emphasise that the intervention was to honour oral tradition rather than a design for Indigenous communities.[28] We also took the opportunity to actively discuss the issues around cultural sensitivity introducing resources that educate and suggest tactics to help avoid perpetuating negative stereotypes. One of these readings, co-authored by the first author, describes the problems of speaking on behalf of 'the other' and the importance of situating oneself and through that process understanding one's own role in colonising practices.[29] Another reading was about the relationship between orality and place-making in Indigenous cultures. This provided an ethical framework of sorts. Subsequent iterations of the exercise yielded more moderate and sensitive design responses. But in the large cohort of students with a wide and varying range of capabilities, maturities and skills, we continue to see superficial engagement and tendencies towards de-politicisation of issues.

CONCLUSION

Teaching architectural design this century brings new challenges but also opportunities. Students are faced with a global future that in many ways looks bleak: Ecologies in collapse, species facing extinction, and economies that are tenuous. Fear mongering politicians and fundamentalist terrorists share similar catchcries: the problem is 'the other'. If we keep them out at our borders or invade their territory and change them to be more like us things might improve. But our students know better. They have benefitted from the opportunities that globalisation has brought. They are well travelled, open-minded, and are willing to gather on different soil, amongst different cultures to imagine building new futures, literally and figuratively. Our pedagogical challenge is to equip them with knowledge built on facts, allow them to follow their concerns and help them to read the social and the political in the sites that they work on. We have tried this through assembling briefs that bring 'the other' in, cultivating a studio culture that is mutually supportive across lines of difference, engaging the sensory and allowing for experimenting with an ethico-aesthetic sensibility. While the outcomes have not always been successful, on the whole we have found that our students are producing work that is thoughtful, ethical, and hopeful.

NOTES

[1] A number of architectural, urban and interdisciplinary theorists have considered ways of responding to exhaustion: Angelika Fritz, Elke Krasny and Architekturzentrum Wien, eds., *Critical Care: Architecture and Urbanism for a Broken Planet* (Vienna & Cambridge MA: Architekturzentrum Wien and MIT Press, 2019), 10; Anna Tsing, Heather Swanson, Elaine Gan and Nils Bubandt, eds., *Arts of Living on a Damaged Planet* (Minneapolis: University of Minnesota Press, 2017); Hélène Frichot, *Creative Ecologies: theorising the practice of architecture* (London: Bloomsbury visual Arts, 2019): 12-13

[2] Will Steffen et al., *Global Change and the Earth System: A Planet Under Pressure* (Berlin: Springer Science & Business Media, 2006); see also Great Acceleration, Global International Geosphere-Biosphere Program (Stockholm: Royal Swedish Academy of Sciences, 2015)
http://www.igbp.net/globalchange/greatacceleration.4.1b8ae20512db692f2a680001630.html

[3] Anna Tsing, Heather Swanson, Elaine Gan and Nils Bubandt, eds., *Arts of Living on a Damaged Planet* (Minneapolis: University of Minnesota Press, 2017) G5.

[4] Joan Tronto and Berenice Fisher, "Toward a Feminist Theory of Caring," in Emily Abel and Margaret Nelson, eds., *Circles of Care: Work and Identity in Women's Lives* (Albany, NY: State University of New York Press, 1990), 40.

[5] Angelika Fritz, Elke Krasny and Architekturzentrum Wien, eds., *Critical Care: Architecture and Urbanism for a Broken Planet* (Vienna & Cambridge MA: Architekturzentrum Wien and MIT Press, 2019), 13.

[6] María Puig de la Bellacasa, *Matters of Care,* (Minneapolis: University of Minnesota Press, 2017), 42-49.

[7] María Puig de la Bellacasa, *Matters of Care,* (Minneapolis: University of Minnesota Press, 2017), 31.

[8] Bellacasa section is "Assembling Neglected 'Things'". Her interest is in theorizing the caring relationships we need to develop for more-than-humans, whereas ours is to introduce students to some of the key challenges architects face.

[9] Jane Rendell, Jonathon Hill Mark Dorrian and Murray Fraser, *Critical Architecture* (London: Routledge, 2007).

[10] Steffan Lehman, "Rethinking the Design Studio: Art + Architecture – A Case of Collaboration in an Interdisciplinary Context", in Al-Qawasmi J. *Changing trends in architectural design education*. Morocco: CSAAR, 2006, 91-106

[11] Steffan Lehman, "Rethinking the Design Studio: Art + Architecture – A Case of Collaboration in an Interdisciplinary Context," in Al-Qawasmi J. *Changing trends in architectural design education*. Morocco: CSAAR, 2006, 91-106

[12] Diane Ghirado I'ntroduction", Diane Ghirado, ed., *Out of site: a social criticism of architecture* (Seattle: Bay Press, 1991): 25.

[13] Diane Ghirado 'Introduction', Diane Ghirado, ed., *Out of site: a social criticism of architecture* (Seattle: Bay Press, 1991): 25. Geographer Eduard Soja declared it both 'an inside and outside critique of the artful science of architecture…(breaking) open the thick cocoon of self-referential discourse that has made architecture little more than a private advertisement for itself.' Eduard Soja's review, back cover.

[14] J.K Gibson-Graham *A post-capitalist politics* (Minneapolis: University of Minnestoa Press, 2016), cited in Angelika Fritz, Elke Krasny and Architekturzentrum Wien, eds., *Critical Care: Architecture and Urbanism for a Broken Planet* (Vienna & Cambridge MA: Architekturzentrum Wien and MIT Press, 2019), 14.

[15] Australia is the only colonised nation in the world that has no Treaty with its first people. Settled by the British under the doctrine of *Terra Nullius* – a Latin term meaning empty land – Its First People were not recognised as citizens with the right to vote under the constitution until a referendum in 1967. In 1988 Prime Minister Bob Hawke promised a treaty, but it never eventuated. In May 2017, fifty years after the referendum, a First Nations National Constitution convention of 250 Aboriginal and Torres Strait Islander delegates took place at Uluru, where a model for constitutional reform was articulated in the Uluru Statement from the Heart. This was rejected by Prime Minister Malcom Turnbull without discussion. A Treaty is finally underway at a state level between Victorian Aboriginal groups in the State of Victoria with the election of a First Peoples Assembly of Victoria in December 2019. There remains no constitutional recognition of Indigenous sovereignty.

[16] Details about Billibellary's walk is available at https://murrupbarak.unimelb.edu.au/engage/billibellarys-walk

[17] In Australia one of the enduring blights on the national consciousness is our treatment of refugees and asylum seekers. While post-war refugees had been welcomed and formed a core workforce for infrastructure construction in the mid 20th century, now they are regarded as pariahs, many of them languishing in off-shore detention centres. Australia may be one of the worst culprits, but it is not alone. The UNHCR estimates that there are over 70 million refugees in the world today of which 3.9 million are stateless. There was a dramatic spike in 2015, when 1,005,504 refugees fleeing conflict in the Middle East arrived en-masse in Europe, four times the

number in the previous year. The influx has given the hard right a new power base amongst ordinary people. The year after the mass migration, Brexit-ers captured enough support to win the referendum to leave the European Union and in the USA Donald Trump won the presidential election. A key platform in both the referendum and election was border control to better keep 'others' out.[17]

[18] Ben Rawlence, *City of Thorns: Nine Lives in the World's largest Refugee Camp* (Picador, 2016)

[19] María Puig de la Bellacasa, *Matters of care: speculative ethics in more than human worlds* (Minneapolis: Minnesota Press, 2017): 69-93.

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[21] María Puig de la Bellacasa, "Touching Technologies, Touching Visions. The Reclaiming of Sensorial Experience and the Politics of Speculative Thinking." *Subjectivity* September 2009 28(1): 307.

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[28] Duane W. Hamacher 'Memory Code: How oral cultures memorise so much information' *The Conversation* Available at https://theconversation.com/the-memory-code-how-oral-cultures-memorise-so-much-information-65649 last accessed, 20th December, 2019.

[29] Janet McGaw, Anoma Pieris, Emily Potter, "Indigenous place-making in the city: Dispossessions, occupations and implications for cultural architecture," *Architectural Theory Review.* December 2011 16(3): 296-311.

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DISRUPTION, IMPROVISATION, REDESIGN – TEACHING COMPUTER ANIMATION AND VISUAL EFFECTS DURING THE COVID PANDEMIC

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INTRODUCTION

The disruption caused by the Covid-19 greatly affected learning and teaching practices across the globe[1] and virtual learning solutions had to be adopted where in-person learning was not possible[2]. This paper highlights the challenges and obstacles presented by the Covid-19 pandemic disruption to camera-based teaching delivery and assessment, and the new blended learning and teaching opportunities that have consequently evolved across a range of different arts, design, craft, technology, and production-based subjects within the computer animation and visual effects undergraduate framework at The National Centre for Computer Animation at Bournemouth University, UK.

The National Centre for Computer Animation

The National Centre for Computer Animation (NCCA) at Bournemouth University, UK was established in 1989[3] and has been a pioneering institution in computer animation education. Several NCCA graduates have gone on to win BAFTA, VES, and Academy Awards. In 2011, the NCCA received the Queen's Anniversary Prize for its contribution to world-leading excellence and pioneering development in computer animation. The key to the NCCA's success is its interdisciplinary emphasis on arts, science, and technology [4]. As such, the terms "creative" and the "technical" do not conform to the arts and science disciplines respectively but can apply to different aspects of the same subject area or skillset - whether it is programming, texturing, lighting, matte painting, animation, rigging or compositing - they can be viewed as being both technical and creative at the same time.

When the Covid-19 pandemic started, the NCCA was offering three 3-year undergraduate and three 1-year Masters courses; BA (Hons) Computer Animation Art and Design, BA (Hons) Computer Animation Technical Arts, BA (Hons) Visual Effects, MA Digital Effects, MA 3D Computer Animation, and MSc Computer Animation, Games and Effects. The Masters courses at the NCCA are designed to be intensive, conversion courses in that they primarily recruit students from disciplines other than computer animation and/or visual effects and teach them the mastery of the respective subject areas. The undergraduate courses, given the 3-year duration, have more opportunity to build on transferable and soft skills in addition to subject specific skills and knowledge.

Given the wide range of subjects and skills taught across these degree courses, the mode of delivery across the units varied from lectures, seminars, tutorials, computer lab-based software classes, field trips, drawing studio sessions, and camera studio workshops. There was also active use of Bournemouth University's virtual learning environment (VLE) for uploading lesson content, supplementary learning material, blogs, assignment briefs, assignment submission, marking, and feedback. Prior to the Covid-19 pandemic, the VLE was also being used as a means of unit-specific communication and announcements to students. Some tutors had also conducted online tutorials if in-person meetings were not possible. Most software applications used were also available to students through an online application portal pre-pandemic.

DISRUPTION

Bournemouth University had to close at less than 24 hours' notice on 20 March 2020 due to the Covid-19 pandemic with only the most critical services remaining open. Students were advised to return to their homes if they were able to do so. Many international students had to fly to their home countries during travel uncertainty and varied international travel restrictions. At this point, all face-to-face in-person teaching ceased and all teaching and learning activities had to be arranged online.

Challenges

This was particularly problematic for units that comprised of drawing and camera studio workshops. In case of camera-based units, students not only needed to gain practice, experiential and material knowledge, and technical tool competency, but they also needed to be thoroughly familiar with all the health and safety protocols, and risk assessments; under normal circumstances, students would be taught safe studio production practices under staff supervision to mitigate against any risks of injury due to incorrect use of production kit or studio lighting. Whilst some students did have interchangeable lens or bridge cameras, most students only had access to their camera phones for undertaking any photography or video-based assignments. In the United Kingdom and some other countries, people were confined to their houses and gardens; several students were restricted to their rooms or student flats which considerably limited photography and filmmaking opportunities.

As a consequence, student learning derived from solving problems situated in particular real-world settings was severely compromised; Lumet[5] gives the example of Akira Kurosawa framing a certain shot in a period film in a particular way to avoid showing the Sony factory that was on one side of the frame, and the airport, which was on another side. Filming and photographing real world situations where the student needs to improvise and adapt quickly, considering the problem setting, introduces another level of learning that adds "complexity, uncertainty, instability, uniqueness, and value-conflict"[6]. Whilst this sort of real-world problem setting based activity may not provide concreate answers, it does provide substantial knowledge insights[7] and experiential learning[8] that drive the critical making process.[9]

Another big challenge for students was working in groups remotely especially where group members were in different time zones.

IMPROVISATION

Over the first weekend of university closure, staff tested the viability of different online meeting software for conducting online classes and shared their findings across the department. Both third party software and the virtual classroom inside the Bournemouth University VLE were used over the next week. Two remote software solutions were also rolled out where the students could either: a) log in to and work on the high-end lab computers on campus using their home computers, or b) if students had sufficiently powerful computers, they could log on to the university network to authenticate the software applications which they could run on their own computers. The former solution resulted in a

slight lag and lack of graphic tablet pen pressure sensitivity which made digital matte painting tasks difficult. Some software companies also allowed free temporary software licenses for students at the start of the pandemic which proved incredibly useful.

Assignment briefs had to be modified to ensure students could complete the tasks without the need for specialist camera kit or in-studio production. Bournemouth University introduced a no-detriment policy whereby the average grades attained by students prior to 15 March 2020 would be used as a minimum threshold to ensure students' grades did not suffer due to the pandemic.

By the start of the second week, all teaching and learning at the NCCA, including drawing and camera workshops, had been moved online. The drawing workshops were conducted using videos of models in different poses with the instructor providing real-time online feedback. The students were also set practice assignments where they could practice drawing self-portraits in front of a mirror. Video tutorials as well and online support sessions were provided by the tutor for life drawing. For all camera workshop-based units, the content and delivery were adapted so that specialist cameras and lighting kits were not required, and students only had to use their camera phones. To this end, synchronous delivery was used for conveying conceptual, theoretical, and practical knowledge such as photographic exposure, lighting and design principles, colour theory, etc. Asynchronous delivery was used to convey operational and supplementary knowledge such as specialist camera operations; detailed instructional videos about safe production management, and camera and studio setup were created by the instructors using the specialist camera production and lighting kit. Whilst specialist camera operations were not being assessed in the modified assignment briefs, it was decided that, given this was still something that the students would need in the following units, the camera workshops would be delivered as intensive blocked delivery as soon as it was possible and safe to do so. Weekly assignments and film screenings were set that the students could do using their camera phones which allowed for sustained engagement, feedback, and building camera craft competency. The notion of breakout room activities was extended over a week such that a topic would be introduced one week and concluded the next, with a practical exercise set in between. Formative feedback was provided to students on the work that they would upload to the VLE each week allowing that worked as an online flipped classroom[10] approach. During the latter half of the second session another new topic was introduced with respective reading, film viewings and photography/filming exercises set for the following session and so on. Having week-to-week student assignments on the online portal helped track the learning per student over the course of the unit, as well as across the cohort on a week-by-week basis. Having gone through the practice and struggles of trying to achieve the desired outcome, the answers, solutions and conclusion to the topic, the lessons were better appreciated and remembered by the students. This teaching model allowed students to reinforce their conceptual knowledge through practice and experiential learning.[11]

Delivering camera workshops as intensive two-day blocks worked very well once teaching resumed. The workshops were conducted in an outdoor setting, with social distancing where possible to minimize the risk of Covid-19, as can be seen in Figures 1 and 2. The workshop delivery pattern was changed significantly where the blocked delivery consisted of each student assembling and de-rigging the camera rigs and lighting as opposed to five 2-hour camera shoots pre-pandemic stretching over ten weeks. This intensive, blocked camera training approach greatly helped technical craft knowledge retention as well as craft practice delivering student camera competency that is historically unparalleled. It also allowed for more extensive student driven practice shoots to be undertaken by the students once they had completed the workshops rather than working on set briefs for camera shoots.

Figure 1. Track and jib camera workshop for the Visual Effects Photography and Acquisition unit being conducted outdoors with actor and crew members wearing masks and adhering to social distancing.

Figure 2. Greenscreen camera workshop for the Visual Effects Photography and Acquisition unit being conducted outdoors with actor and crew members wearing masks and adhering to social distancing.

Online tutorials proved very successful as the students could share their computer screens easily. This was particularly useful in the case of group projects, where in the past, tutors and students had to keep going from one student's computer to another's and this resulted in a lot of disruption and waste of time logging in and searching for the files.

The units where the students were conducting individual personal research such as in the "Personal Research" or "Research and Development" units proved relatively less impacted in terms of the intended learning outcomes and quality of student work. A number of these studies were published in national and international conferences. The choice of research topics, however, was impacted given

that the students had to be mindful of choosing topics where they did not need to go to public places for data gathering and primary research.

The individual and group project tutorials were conducted online via Microsoft Teams, and this proved to be a very useful, streamlined approach where students could upload the work prior to the tutorial and also share their screens to show the project progress where required. The video meetings also proved useful in ensuring student welfare and being able to talk to the students if they were feeling low and signpost them to appropriate services as needed.

The Final Major Project unit did prove to be very challenging for students working remotely as it was the single biggest project that they had to undertake in the third year of their undergraduate degree course. Whilst all possible academic support was provided, the length of the project, the uncertainty and disruption of Covid-19, the social isolation due to lockdowns, as well as technical issues, all took their toll on the students, who despite all of these issues, still managed to produce commendable work.

The NCCA hosts the BFX festival which is one of the UK's biggest animation, visual effects, and games festivals. In 2020, the BFX Festival had to be conducted completely virtually. Whilst this was not the most desirable option, it did allow for bringing in a number of international guest speakers from around the world. In order to keep the students engaged, two-time Academy Award-winning cinematographer Roger Deakins, James Deakins, and renowned concept artist John Howe, were invited for virtual guest speaker sessions that proved very popular with the students. In addition, several student well-being sessions and socials were also conducted online to ensure students did not feel too isolated or depressed.

REDESIGN

Given the success of the staggered topical delivery model - where the first session introduces the topic and sets the relevant reading, film viewing and camera practice whilst the second session is used to provide formative feedback and conclude the topic – this model has been retained in the post-pandemic delivery as well although the classes are now in-person.

The group and one-to-one tutorials are also being kept online where possible as they provide better time efficiency, management, feedback, and record-keeping. In order to widen participation and public engagement, an open curriculum is another aspect that is in consideration and already being implemented to an extent where the instructional videos and content is being made available online.

The practice of setting weekly assignments and providing formative feedback has been very successful; it was found that most students in the first year made the same mistakes and therefore a random sample of student work was enough to provide feedback to all students during seminars.

Given that there was increased onus on the students to work independently and try to resolve issues themselves as much as possible, independent learning amongst the student cohort flourished. The weekly exercises, formative feedback and reflective practice allowed for better retention of knowledge and improved critical thinking. Being confined to their rooms or flats, the students also had to come up with out-of-the-box ideas and solutions, and switch to a solutions-focused approach after pondering over the problem did not work. Having weekly exercises during the week also proved to be a fun and enjoyable exercise for students especially given the boredom and isolation during the pandemic lockdown. The production of student artefacts also allowed for a catharsis in some cases such as Cornall.[12]

The intensive, blocked camera workshops have worked very well, and this approach has now been integrated into the unit delivery plan for the Visual Effects Photography and Acquisition unit going forward.

CONCLUSION

The Covid-19 pandemic has resulted in a critical reflection and reassessment of teaching methods, content delivery, and assessment and feedback techniques. Whilst this reassessment has been extremely beneficial in streamlining teaching and assessment, it remains to be seen if these methods will still be acceptable in the post-Covid-19 pandemic world; there is considerable student pushback for in-person classes, but session attendance has dwindled. Similarly, there is a push for recorded sessions but according to the access statistics, very few students have been engaging with the online content provided. Getting student engagement in the post-Covid era may prove just as challenging as it was during the Covid-19 lockdowns. However, the Covid-19 pandemic has certainly proved to be the greatest of disruptors to teaching and learning approaches in recent times and rethinking these approaches have allowed for considerable modifications and more efficient teaching, learning and assessment practices. As a consequence, student engagement and student knowledge retention has increased significantly that has resulted in an increase in overall student grades in these units. The students also have a more realistic grasp over the amount of production time that it takes to create a piece of work which has resulted in better and clearer outlining of project scopes. The project management and project tracking skills have also improved as a result given the need for keeping on top of the production schedules during group project work. One of the great transformations in terms of student communications has been the shift from using social media platforms to using the more specific VLE, Microsoft Teams and ShotGrid platforms that provide better functionality and facilitation for production work whilst also allowing the tutors to monitor the production progress. The student and tutor online meetings can be recorded with the click of a button allowing for all the advice and concerns to be logged and reflected upon when needed.

Most of the teaching practices experimented with and utilized over the course of the teaching during the Covid-19 pandemic have proved incredibly useful and are being integrated into the teaching, learning and assessments practices albeit with more pre-Covid style in-person sessions given the resumption of normal teaching. The new blended teaching and learning model means that whilst students are required to attend lectures and seminars in person, there is provision to join the sessions remotely in exceptional circumstances. The tutorials can be either online, or in-person depending upon the nature of the work being discussed and attendees' in-person availability. Similarly, the use of VLE and direct messaging on top of email has allowed for better and more prompt communications between staff and students. The camera workshops are now delivered as intensive blocks with students being allowed more time to experiment with filming and photography on their own. This has allowed for improved health and safety and technical craft knowledge retention, and a chance for students to partake in more enjoyable and flexible camera shoots independently.

The teaching and assessment best practices identified during the Covid-19 pandemic have now been fully integrated with the normal teaching practices providing a hybrid, blended learning model that allows greater flexibility to students to experiment with their own ideas whilst increasing knowledge retention and student engagement. These best practices also allow for a more efficient, streamlined delivery that adds better teaching value.

These insights have compelled staff to rethink the design and delivery on degree courses and have paved the way for designing more efficiently delivered courses in the future.

NOTES

[1] I T Sanusi, S A Olaleye, and O A Dada, "Teaching Experiences during COVID-19 Pandemic: Narratives from ResearchGate," in *2020 XV Conferencia Latinoamericana de Tecnologias de Aprendizaje (LACLO)*, 2020, 1–6, https://doi.org/10.1109/LACLO50806.2020.9381133.
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[4] P. Comninos, L. McLoughlin, and E. F. Anderson, "Educating Technophile Artists and Artophile Technologists: A Successful Experiment in Higher Education," *Computers and Graphics (Pergamon)* 34, no. 6 (2010): 780–90, https://doi.org/10.1016/j.cag.2010.08.008.
[5] Sidney Lumet, *Making Movies*, 1st ed. (New York: Vintage Books, 1995), ix.
[6] Donald A Schön, *The Reflective Practitioner: How Professionals Think in Action* (United States of America: Basic Books, Inc., 1983), 39-40.
[7] Robin Nelson, *Practice as Research in the Arts: Principles, Protocols, Pedagogies, Resistances* (Palgrave Macmillan, 2013), 30.
[8] John Dewey, *Experience and Education*, *The Kappa Delta Pi Lecture Series* (Collier Books, 1938), 19-20.
[9] John Maeda, *The Art of Critical Making Rhode Island School of Design on Creative Practice*, ed. Rosanne Somerson and Mara L. Hermano (John Wiley & Sons, 2013), 19.
[10] Christian Stöhr, Christophe Demazière, and Tom Adawi, "The Polarizing Effect of the Online Flipped Classroom," *Computers & Education* 147 (2020): 103789.
[11] Rehan Zia, S Balaji, and J Chun, "Teaching Camera Craft Online during the Covid Pandemic," in *Sixteenth International Conference on the Arts in Society* (Perth: The University of Western Australia, School of Design, 2021).
[12] Ashley Cornall, "Integrating Abstract Expressionism with 3D Lighting within the Light-in-Space Movement," in *ACM SIGGRAPH 2021 Posters*, 2021, 1–2.

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AN EVALUATION OF TERTIARY EDUCATORS' PERCEPTIONS OF ONLINE TEACHING RELATED ERGONOMIC FACTORS

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INTRODUCTION

In the 21st century, there has been a paradigm shift in attitudes towards having an online education system, and online learning is no longer peripheral or auxiliary, but a vital part of today's conventional tertiary education system.[1] At the end of 2019, the outbreak of the COVID-19 pandemic caused traditional classes to 'move online' in an essential high-priority manner, which resulted in extra stresses and workloads to the university teaching staff who were already struggling to balance teaching, research, and administrative responsibilities, as well as with the work-life balance.[2] Educators from all backgrounds and age groups were required to develop and implement their scheduled classes from home, while all the practical and technical hurdles had to be overcome. Some university educators do not have the proper pedagogical content knowledge(PCK),[3] required for online teaching,[4] including technical and administrative features of online teaching such as, establishing workflows, using particular technical platforms and tools, etc. Recent studies revealed that,[5] the complex nature of the instructional situation and inadequacies in planning and organization are some of the main difficulties described by university teachers with respect to changing to developing web-based courses. The educators became responsible for dynamically repurposing and redistributing resources, upskilling their digital proficiencies, and developing new materials to change over from traditional face-to-face and blended programs to a distance learning and/or online education delivery mode.[6] Some educators had been teaching online for many years, while other tertiary educators were new to online teaching.

There are benefits and barriers to online teaching. The benefits have been described as educator and student satisfaction. Cost-effective. Flexible convenient teaching. Easy to update. Provides diversity. Timesaving. Communication method. The most tolerant teaching environment. Multisensory. Develops problem-solving, soft skills, and computer/technology literacy skills. It forms a favourable environment for learning, develops student participation and improves accessibility of education.[7] Barriers to Online Teaching are acceptance; problems with the interface, interaction, and usability. There is the initial setup and ongoing cost; technology misuse; difficulties with the interaction between peers and teachers; unavoidable interruptions; minimal participation in class by students; interacting limits; changing of roles; distraction and inconvenience.[8]

As the role of online educators is different from traditional classroom educators, this potentially affects the educators ergonomically. Ergonomics (or human factors) is the scientific discipline

concerned with the understanding of interactions among humans and other elements of a system. It involves fitting the task to the person and the product to the user. Ergonomics is a universal, human-centered approach to work systems design considering physical, cognitive, social, organizational and environmental factors.[9]

PHYSICAL ERGONOMIC FACTORS

Physical ergonomics is concerned with the online educator's human anatomical and anthropometric measurements that would influence desk design, seating, computer height, and other equipment and space used. Online teaching can involve continuous hours of sitting on a chair without changing posture. Not having an ergonomically designed workplace and equipment may lead to certain musculoskeletal disorders such as back pain.[10]

ENVIRONMENTAL ERGONOMIC FACTORS

The lighting, ventilation, temperature, and noise of the room where the online educators spend most of their time are examples of environmental ergonomic factors.[11] There were some ill health effects related to online teaching reported in the qualitative study conducted by Jansz et al. (2016),[12] as one of the online educators reported that spending a large amount of time working at a computer screen in a poorly lit room caused headaches. This educator needed to purchase stronger reading glasses to continue doing online teaching.

SOCIAL ERGONOMIC FACTORS

Social ergonomics refers to the communication and interaction between students, educators, and relationships with co-workers. Time spent in online teaching includes a combination of communication through email, telephone conversations, discussion groups, chatroom questions and answers through blackboard, and for some students giving time for face-to-face conversation via the internet.[13] Students' e-mails to be answered can be sent at any time leaving less time for other activities including the educator's personal life. Studies have suggested that the online educator devotes substantial time providing technical support to the students.[14]

ORGANISATIONAL ERGONOMIC FACTORS

An organizational ergonomic factor that impacted online teaching most was the educator not having enough time to do all of the updates that they would like to make for their teaching materials, to be able to complete all work, including marking student assignments and to complete all university required paperwork within their workload allocation time.[15] Van de Vord and Pogue (p. 141),[16] stated that providing student assessment feedback is much more time-consuming for online instructors. Sessional staff who were employed to mark student assignments reported that they had to work unpaid overtime to be able to do this work and that the time allowed did not include time for giving students adequate feedback on the marked work. It was also stated that there was no time allocation provided for downloading assignments, checking them through Turnitin, uploading assignments, and doing marking moderation.[17] Gous & Roberts (p.268),[18] reported: "academic staff work long hours, even weekends."

COGNITIVE ERGONOMIC FACTORS

Cognitive ergonomics is the way that people think and process information.[19] Cognitive ergonomics involves identifying, interpreting, and processing information by an individual.[20] It includes perception, learning ability, memorizing power, problem-solving, and motivation. Cognitive ergonomic factors that were reported as impacting educators' teaching online included having

insufficient knowledge of the university policies, procedures, the usage of modern technologies, and online educational tools.[21] This research was conducted to identify how these five ergonomic factors affect, both positively and negatively, educators who teach online.

METHODOLOGY

This research began with the development of the focus group questions from an analysis of the published literature reviewed related to online teaching and the COVID-19 pandemic. It included recruiting the focus group participants, conducting the focus group interviews, and analysing the focus group responses using NVivo to identify common themes. Focus group discussions are commonly used to obtain an in-depth understanding of the issues. A focus group can be defined as a group of individuals selected and assembled by researchers to discuss and comment on, from personal experience, the topic that is the subject of the research.[22]

Altogether 12 participants were recruited from a University as Focus group participants. All of the participants selected were academics with online teaching experience. The focus group discussion was scheduled during a busy time of the year, so the discussion was conducted through 4 mini focus groups with 3 participants in each group. Two groups were academics with more than 3 years of online teaching experience and the other 2 groups consisted of academics with less than 3 years of online teaching experience at university level. The 'mini focus group' method was used for the online focus group discussions. The participants were asked open-ended questions by the researcher as open-ended questions inspire participants to provide more detailed conversation, allowing the participants' additional areas and chances to explain and justify their answers if required. They also permit the researcher to ask any follow-up questions wherever necessary to investigate the topic in more depth.

The qualitative data analysis was performed by data coding, dividing all raw data into groups containing phrases, sentences, and/or paragraphs, assigning a code to each group, and finally grouping all the codes into themes. After being checked by participants to ensure accuracy all the interviews were transcribed in the online database NVivo for analysis.

RESULTS AND DISCUSSION

For tertiary education educators with more than 3 years of online teaching experience demographically, there was an equal distribution of gender. For educators with less than 3 years of online teaching experience, all participants were male and had begun online teaching when the COVID 19 lockdown restrictions commenced in March 2020. All of the educators with less than 3 years of online teaching experience and half of the educators with more than 3 years of online teaching experience were teaching engineering subjects. An experienced online teaching participant described how she felt when changing from face-to-face teaching-to-teaching online and said,

"I started teaching online approximately 20 years ago. At first, did not like the concept of online teaching very much, preferred face-to-face traditional teaching as in online teaching physical interaction was missing and I felt it was important. Then for about 5 years, there used to be two versions of all the classes, i.e., one was traditional face-to-face and the other was online. Same course materials and assessments were used for both versions, but the pedagogy was entirely different. Gradually online courses got more acceptance and the platforms and support improved dramatically. At first for online courses all the printed course materials used to be sent to the students, there was no visual contact opportunity available. Over the last 10 years, the online education platform has improved dramatically with the availability of various interactive platforms including Blackboard and the Internet. The online education platform has become incredibly streamlined. We started getting lots of support from the IT staff of the university. Support mechanisms got better with the availability of more collaboration options. Still personally prefers traditional face-to-face classes instead of online

versions though accept the inevitable and like to be able to do all my teaching from home with no travel."

Comparison for most engaging factors

After carefully analyzing the answers of educators with more and with less than 3 years of online teaching experience, results showed that the participants of both groups felt positive about the overall flexibility and having less or no travel time requirement when teaching online. The more experienced online educators engaged themselves in preparing course material using new pedagogy, learning and using new technologies, receiving queries and providing feedback, etc., while the less experienced educators engaged more in live sessions, using shared screens while solving the mathematical problem from scratch and informing online student groups.

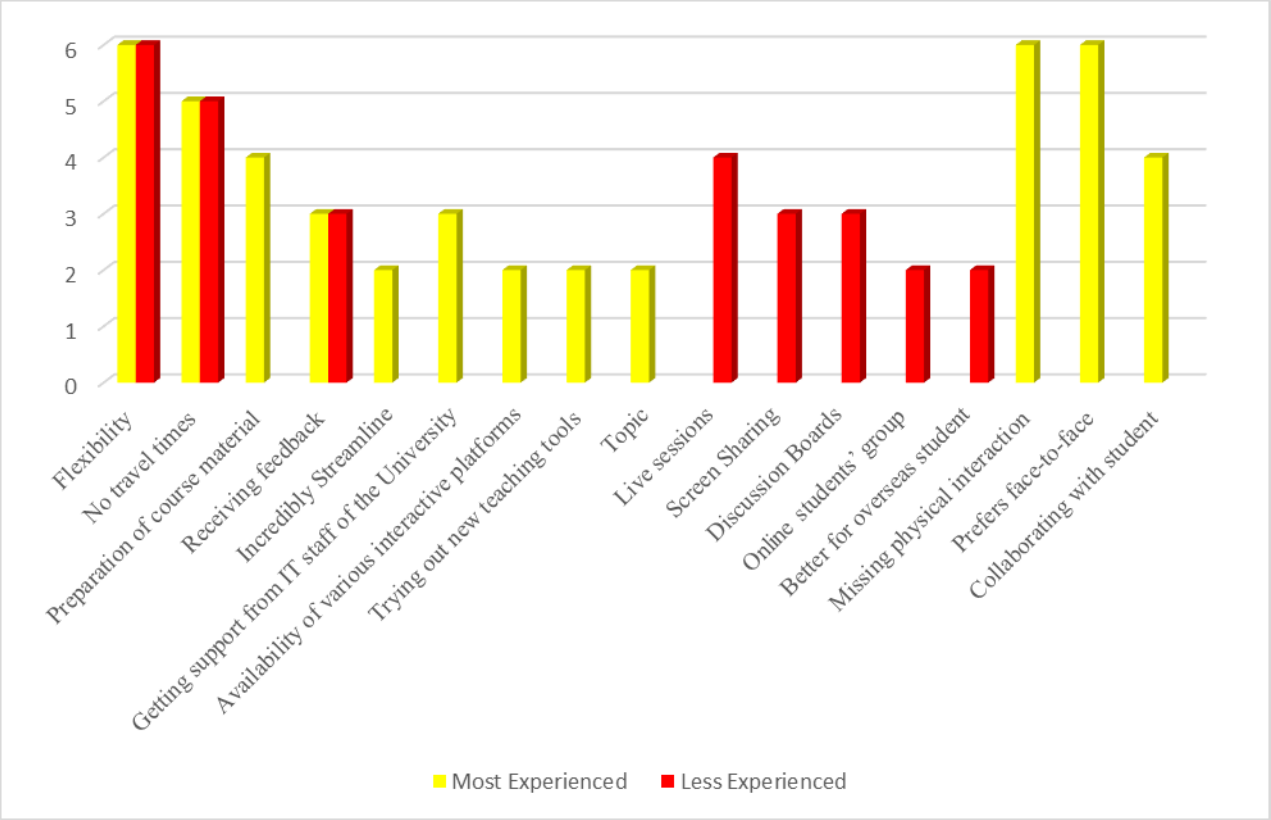

Figure 1. Engagement factors for online teaching

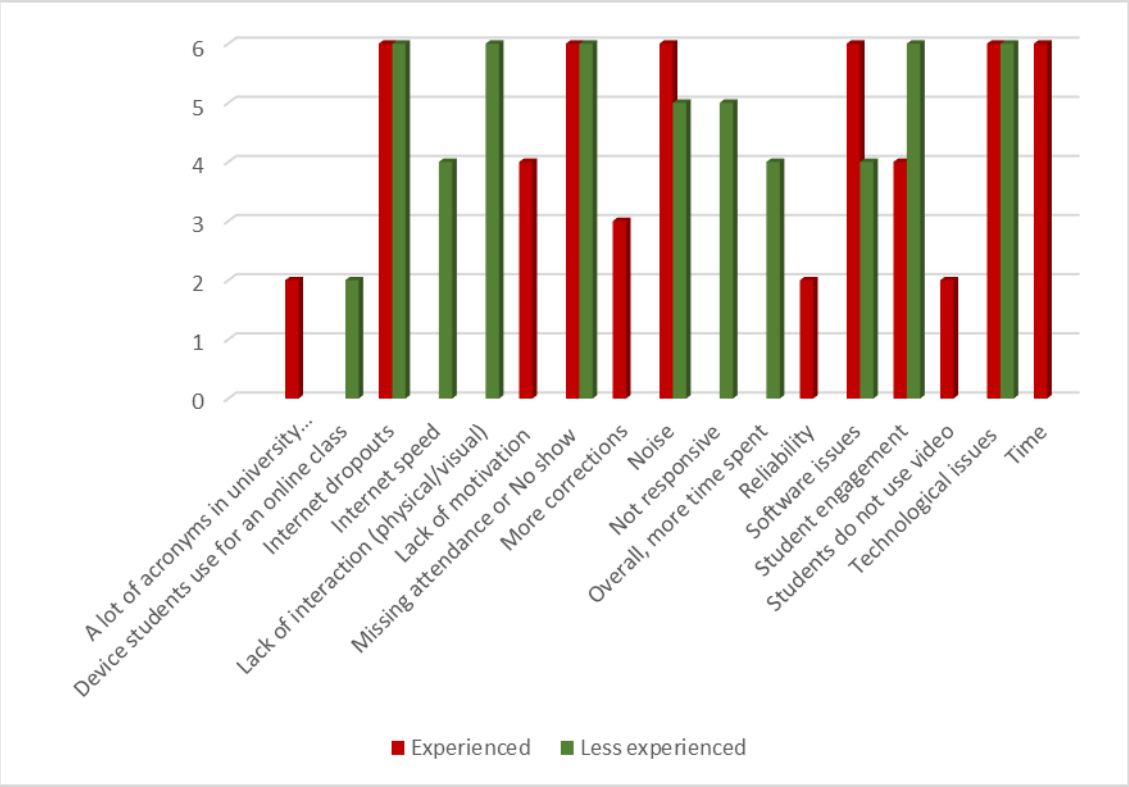

Figure 2. Problems faced in online teaching by both groups

The main problems described by both groups were lack of interaction (physical/visual), missing attendance or no show, technological issues, internet issues/dropout, etc. For example, a participant reported:

"Usually, the main problems faced are encountering problems with technology, internet dropouts or slowing down, hard to identify who is attending class as most of the time students do not use video. Unlike face-to-face teaching in an online environment, teachers are unable to see the students' reactions such as whether the student looks puzzled or needs help, etc. Hard to identify who is attending class. Hard to identify what the students are taking in as they usually turn off the audio /video function".

The experienced educators encountered problems with surrounding noise from working in a shared office, corridor noise as people passed their office, or neighborhood noise while working from home. There were more corrections of students' work required in comparison to traditional teaching. Educators did not feel connected to students and were less motivated because they were not able to see the students' facial expressions or body language to assess the students' level of understanding of the topic. Students did not use the video function, because students did not like being seen online. Less experienced educators were more concerned with the non-responsiveness of the students while attending the online class. Educators also faced difficulties due to the devices used by the students as some of the software only worked with some computers.

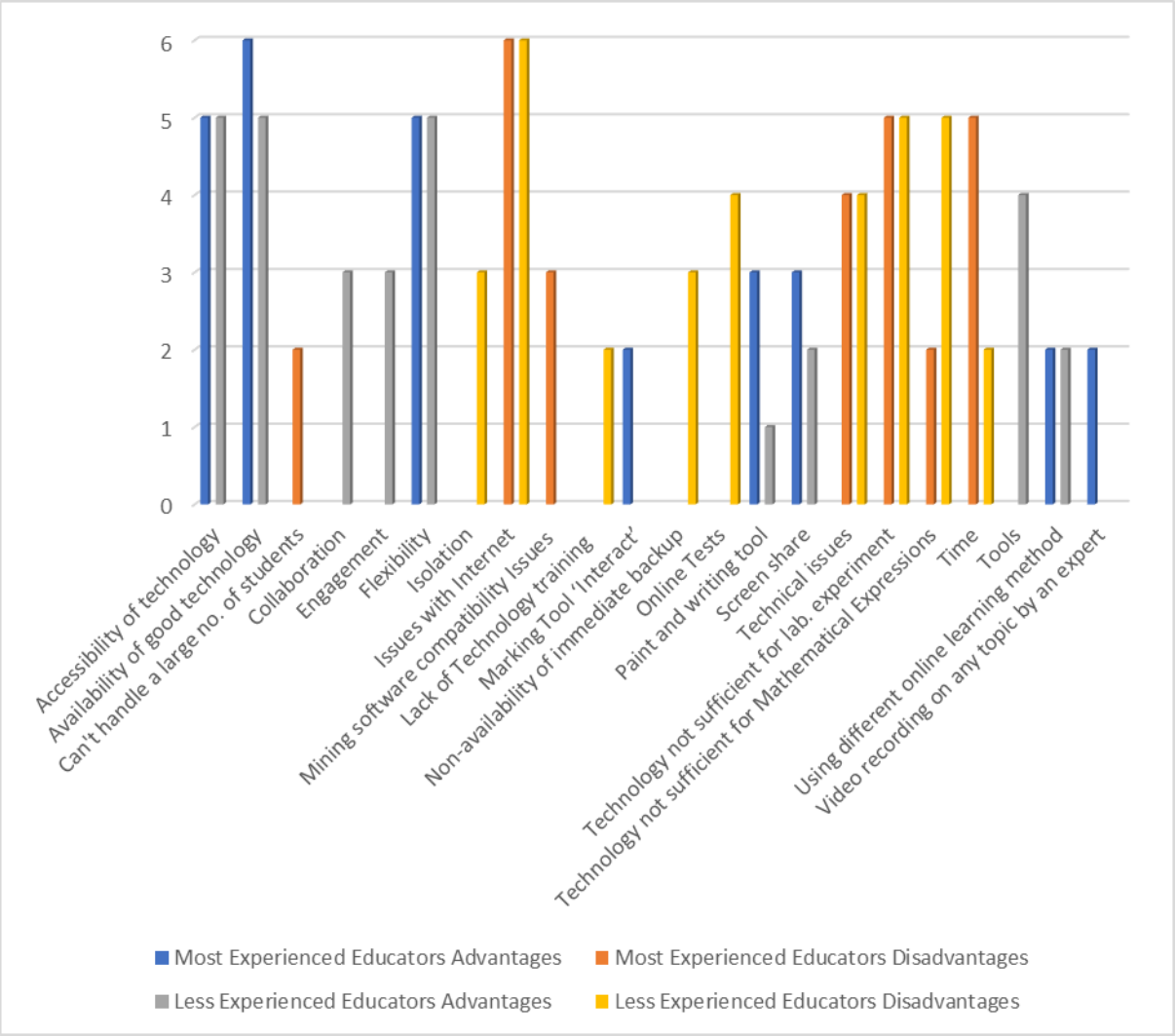

Figure 3. Software and technologies influence your online Teaching

The participants of both groups acknowledged that the software and technology helped to increase general flexibility, there were good software packages and technological tools available. They had concerns about internet issues, technical issues, and competency of software use while teaching mathematical expressions, engineering rotation, laboratory work, etc. The less experienced educators felt that the collaboration and engagement with students in the online educational platform were good and that students learning to use the software tools in their online classes added extra value in their future practical life. These educators were very conversant with technology and other mobile devices. This may have been a reason for them to feel more engaged and collaborative when teaching online. When conducting online teaching less experienced educators felt more isolated than experienced educators did.

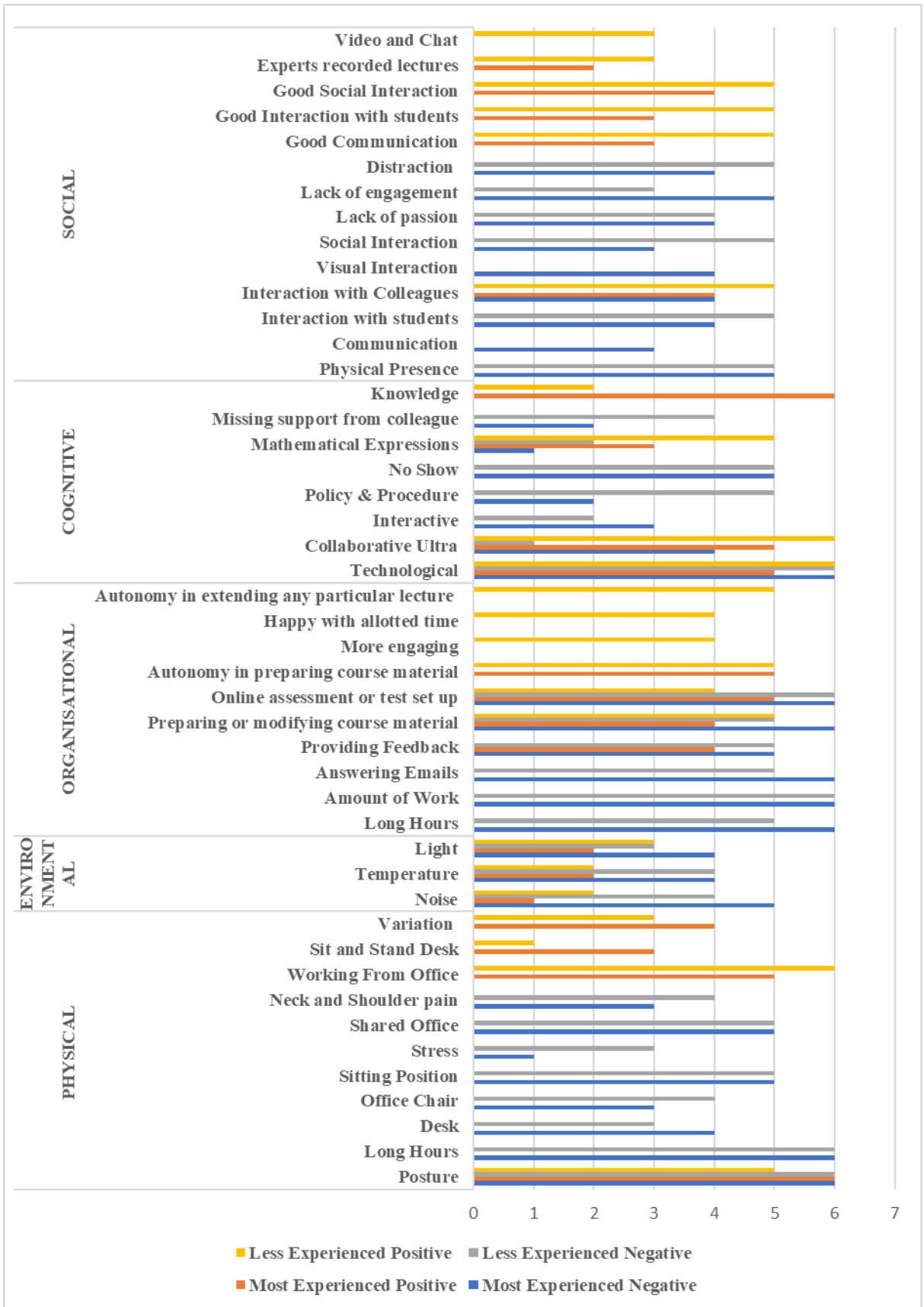

Figure 4. Comparison of positive and negative effects of five ergonomic factors for online educators

Online teaching and physical ergonomic factors

Eighty-three percent of educators with more than 3 years of online teaching experience and 100% of those with less than 3 years of online teaching experience did their online teaching in their university office. All participants from both groups said that they worked long hours. Half of the more experienced educators and 17% of the less experienced educators varied their work posture by using sit-stand desks to allow for changes in working posture when doing written work and when doing online teaching.

Environmental ergonomic factors

All the participants reported having to deal with background noises. The noise came from being located in a shared office, having corridor noise, laboratory noise from the next to the room, etc. For example, a participant said that:

"Noise can be a problem. I work in an office with 6 people. Our desks are next to each other with no barriers between them. When there are online classes, being held if a phone rings and the person answers the phone call, if a student comes in to talk to their lecturer and talks to them, or if anyone types on their computer keyboard, the noise disturbs the online lecture. Because of the closeness of the desks, these noises can also disturb the other people in the room and make it difficult to concentrate on work, particularly when people talk together for a period of time of more than 5 minutes."

One experienced educator worked from home and her home office had no environmental ergonomic issues.

Organisational ergonomic factors

The majority of experienced educators and 50% of inexperienced educators stated that generally extra time was required for efficiently completing all the demands of online teaching, such as preparation of course material depending on the subject matter, providing feedback, answering emails or messages, etc. For example, a participant stated:

"I would like to have enough time to try out new and different creative or innovative features of the software to modify the course material to be more engaging and interesting to the students. Always too busy to do this. Teaching online requires spending long hours before a computer which results in headaches and neck pain."

Also preparing online test material and conducting the test online was reported as being challenging and stressful. Suggestions were made to introduce some kind of training or university workshops to develop and check that all online prospective students have pre-requisite knowledge for learning online.

Cognitive ergonomic factors

The participants of both groups were concerned with the authenticity of the availability of technology for online assessment, detecting plagiarism, etc. The experienced educators were very conversant with the university's policies and procedures towards online teaching-related matters whereas the less experienced educators struggled with knowing the university policies and procedures.

Social ergonomic factors

Participants of both groups missed physical/visual interaction with students. One experienced educator said that "While discussing conceptual things it's easier to do this face to face than online and it is less productive collaborating with research students online."

However, another participant thought that the online teaching platform provided better visual interaction through video, chat, etc.

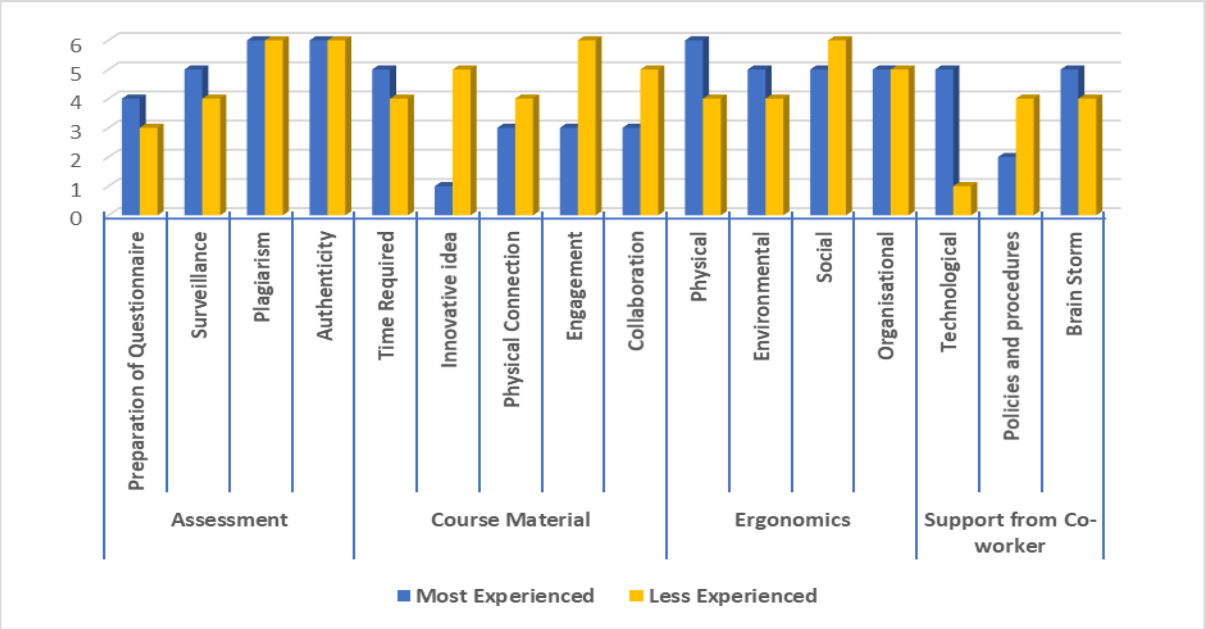

Figure 5. Differences and similarities between traditional vs online teaching

All educators said that the hardest part of online teaching was developing questions especially for science subjects, the authenticity of the assessment, and reducing plagiarism in an open book examination scenario. Preparing course material was also challenging, as they needed to develop it in such a way that it would engage the students in online classes.

Effective online teaching

Both groups agreed that better technology, the internet, and device such as smartphones, tablets, etc. were required for effective online teaching. More experienced educators revealed that spending extra time makes their online teaching more effective. Support from the technical team of the university also helped them teach effectively. Less experienced educators reported that flexibility was the main factor required for them to teach effectively.

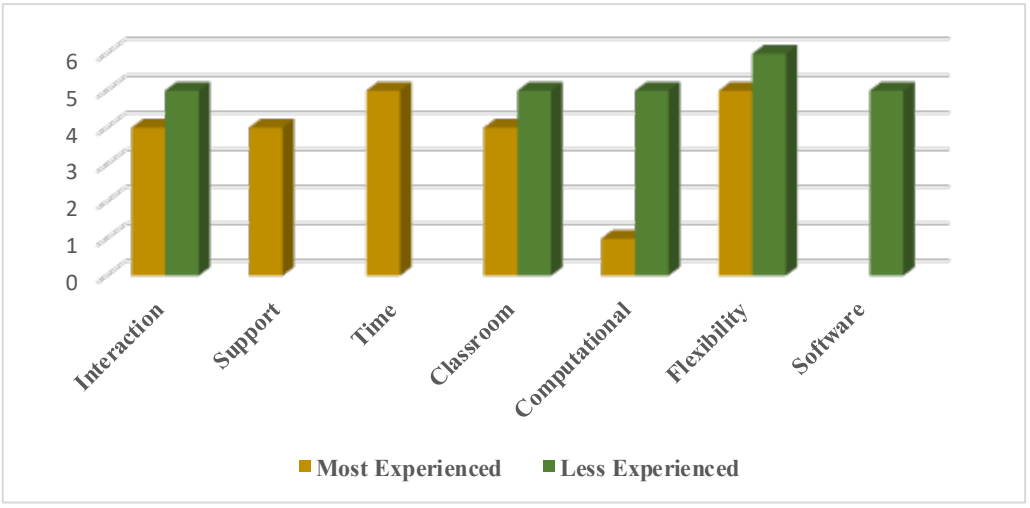

Figure 6. Comparison of factors affecting online teaching

Barriers experienced in online teaching

Participants of both groups thought physical interaction, internet issues, no show or missing audience, less communication between students and educators as students are reluctant to switch on their camera, were the main barriers. Three educators with less experienced in online teaching said that the initial setup for online teaching, getting a quiet place for recording, setting up new online classrooms, and availability for recording online classes were the main barriers. Other barriers were lack of technology knowledge, not knowing the best way to utilize software, and issues related to being able to use some software outside the university campus were the main barriers.

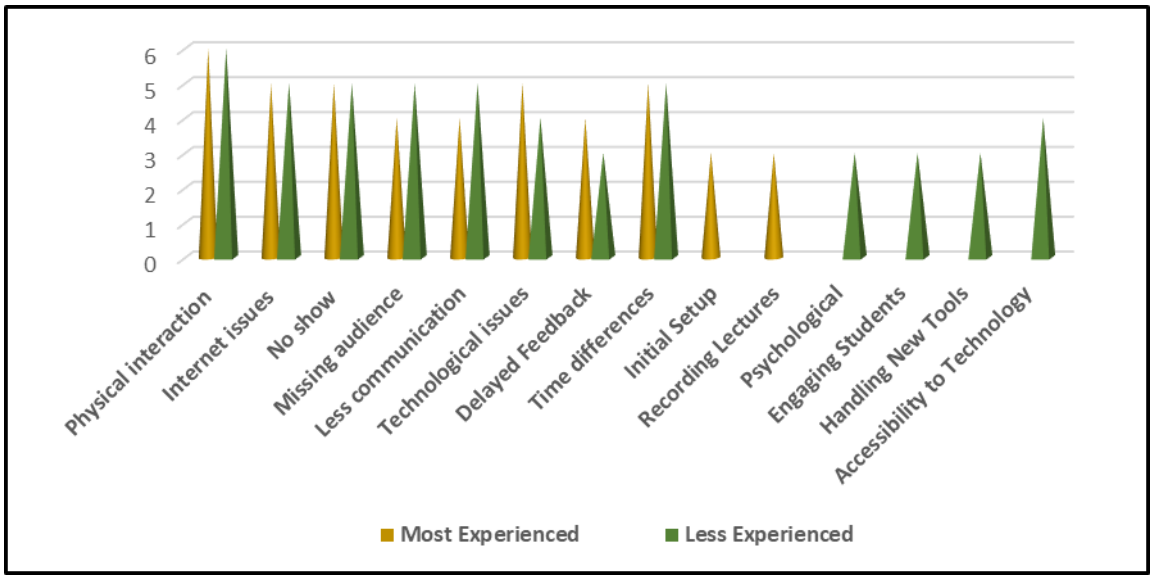

Figure 7. Comparison of barriers experienced in online teaching

The most important factors for enabling teaching successfully online

Participants of all groups reported that spending more time was required, as different subjects required a different way to design and teach the course material. To successfully teach online it was required that there was availability, and usage of the proper devices so that all the technology was compatible with the university technology used. Less experienced online educators said that students struggled with the licensing criteria for software as some software only worked within the university campus.

Figure 8. important factors for enabling online teaching

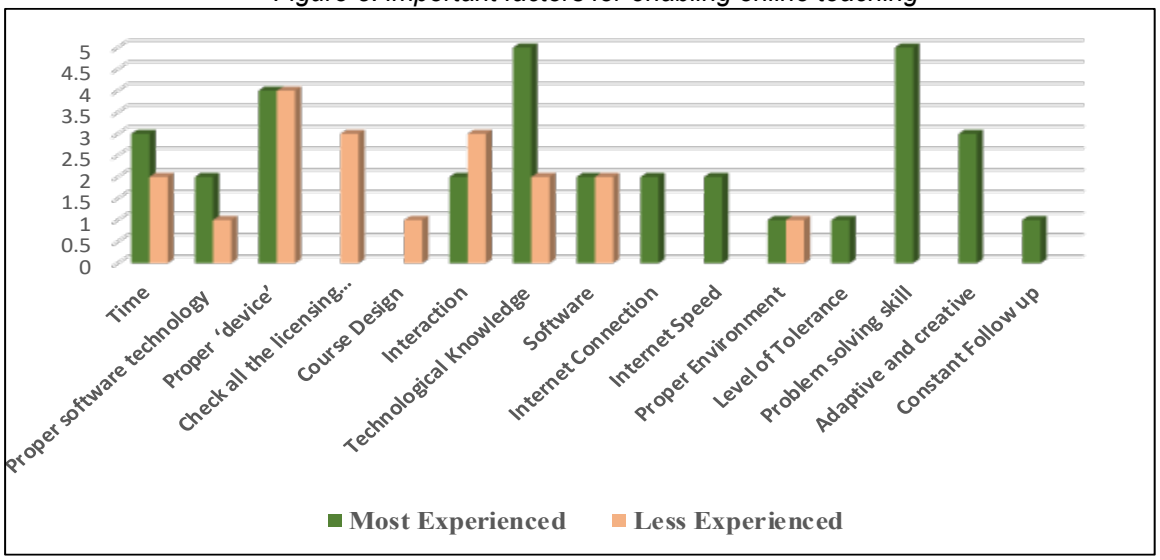

Figure 8. important factors for enabling online teaching

Online teaching is now a common form of education and, as reported by a focus group participant: 'The flexibility of availability of the online courses for the students living in other countries, level of engagement, topic, receiving feedback from students, replying to the questions of the students makes me feel more engaged.'

CONCLUSIONS

The focus group results provided 5 main ergonomic themes; organisational, cognitive, social, environmental, and physical. Participants reported having good physical ergonomic conditions in their office at work but required some improvements in their chairs and work desk when first working from home. The main organisational ergonomic concern was requiring more time to develop and conduct online teaching and provide student feedback. The noise was the main environmental problem. Cognitive ergonomic problems were identified as needing to learn new technologies which sometimes did not work well. Educators were affected by social ergonomic factors that included less personal interaction with students. Educators with more than 3 years of online teaching experience generally had fewer ergonomic-related issues than those who were new to online teaching.

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DEVELOPING ARCHITECTURAL DETAILING SKILL: A SELF-LEARNING METHOD

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INTRODUCTION

Architectural details are of extreme importance for a building design. As being the smallest size of architecture, details define the theoretical expression and technical character of a building and impact its construction process. The art of detailing covers the joining of building products in a functional and aesthetic manner. The diversification of the factors driving the detail design complicates the detailing process.

Architectural detailing is a key skill of an architect at any level of expertise. However, the scope of detail design is too broad and what is taught in architecture education alone is not sufficient. Also, change is constant in architectural technology; new technologies and design quirks have been emerging exponentially. Because of that, many architects endeavor to develop architectural detailing skill throughout their careers with or without the assistance of others. This process often takes place in the form of self-learning owing to the availability of learning resources. Individuals take the initiative in diagnosing their learning needs, formulating learning goals, identifying learning resources, extracting knowledge from resources, and evaluating learning outcomes.

Learning anything by oneself can be an enriching experience. On the other hand, extracting knowledge and providing the targeted outcomes from resources is quite challenging without using a specific method, which prolongs the skill development process. Especially novice architects and students need appropriate methods to learn detailing. In literature, three approaches are applied in the detailing methods, which are insufficient for the following reasons. They are either collections of detail drawings without systematic analysis of detailing logic, or pure theories that are too abstract for developing practical detailing skills, or only case studies without guidelines for applications to other projects.[1]

This study investigates solutions for systematic and target-driven knowledge extraction from the self-learning resources to overcome self-learning challenges. A method or procedure with defined phases, goals, and outcomes is needed for a systematical and target-driven knowledge extraction. Nevertheless, first of all, reliable resources for self-learning should be defined. New knowledge is formulated by analogy, working from what is already known toward what is not known.[2] For this reason, it has been approved to utilize the constructed projects' detail drawings as a learning resource, as it is widely used in existing methods.

Accordingly, this study aims to reveal a self-learning method for architectural detailing through a widely benefitted teaching method, project analysis, namely the case study. The scope is shaped by identifying what could be learned from the project analysis. Designing a detail depends on many

factors, such as human factors, constructability issues, time, and finance.[3] When analysing the details of a project, only one of the solutions that can achieve a specific purpose is seen. Learners may not fully understand the mindset behind the selection of a building product or a detailing technique. The functioning of the detailing process and the logic behind the decisions made cannot be learned. If so, what can be learned from the analysis of a constructed detail? The analysis is able to define which building products are used to achieve specific purposes and how these building products are combined and connected to form a whole that works in harmony.

The research was conducted based on four steps, as illustrated in Figure 1, starting with a literature review. Detail design process, self-learning and case study methods were reviewed to gain a deeper understanding of the subjects. When the studies on the analysis of existing designs were investigated in the literature, it was determined that the reverse engineering method was an effective method in product design and was included in the study. In the second step, a preliminary analysis method was generated through this literature review. Then it was applied by undergraduate architecture students within the scope of the course Detail Design I, given at Mimar Sinan Fine Arts University by the authors. By the application test, the method was evaluated in terms of functionality and ease of application. In the last step of the research, the method was refined based on the data obtained from the application test. The 4-phased project analysis method is explained in the following sections.

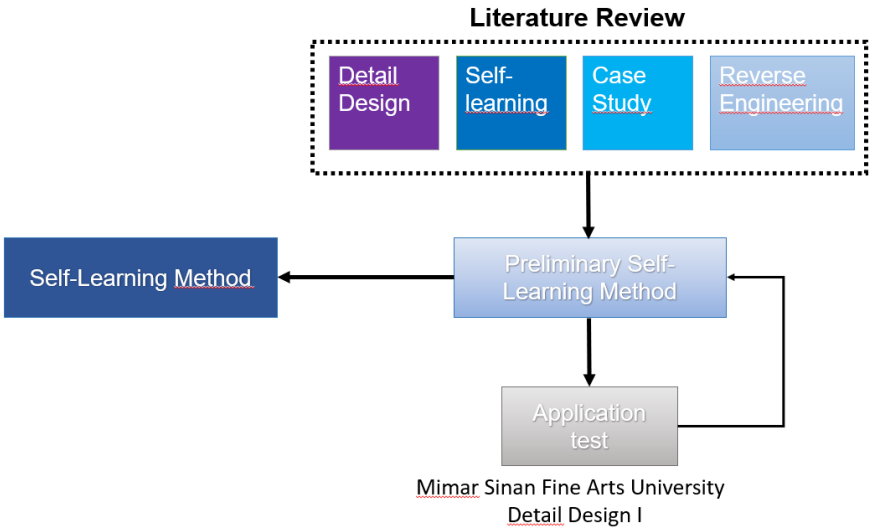

Figure 1. Methodology of the study

PROJECT ANALYSIS METHOD

Before starting to use the method, learners must provide the pre-requirements, which are diagnosing learning needs and choosing adequate learning materials. Learning is an active process constructed from knowledge of experiences, and it is subjective to one's personal reality[4]. Therefore, the nature of the pre-requirements is also shaped according to the personal needs of the learners and often depends on the learner's detailing expertise. The learning need can be diversified as learning a new technology, construction system, building element, building product, or detail pattern. Then an appropriate learning material should be selected that can meet the learning need. Ideal learning materials, which are detail drawings of a constructed project, should include project data with photographs, adequate documentation in drawings, at least 1/20 scale, plan-section-elevation drawings with defined building products. The more defined the project and the details, the more successful the analysis results.

The project analysis method is outlined in four phases: (i) defining the design context, (ii) defining the building products, (iii) defining functions and joining methods of the building products, and (iv) functional analysis of the detail. It is recommended to use the method sequentially, especially for those with little experience in detail design. Each phase serves a specific purpose and has defined outputs. Checklists and templates are integrated into phases to ease and standardize the analysis. Application activities and learning outcomes of each phase are explained in the following sections.

Phase I: Defining the design context

The first phase aims to determine the design factors of the project and the detail to be analyzed in general terms. Understanding the design context is essential for understanding detailing logic, as detail design decisions are strongly tied to the design context.

This phase consists of 3 steps. The first one is revealing the project data, such as the building's function, location, construction year, and natural and built environment characteristics. In the other steps, project design factors and detail design factors are defined, respectively.

Design factors generally describe design requirements and constraints. Adapting from Basarir and Altun,[5] a design factors checklist with 22 criteria was generated for this phase (Table 1). The more information is available on design factors, the better the design context is defined. Among these design factors, the most important one for analysis is the function. Besides, compared to other factors, manufacture, assembly, installation, tolerance, and waterproofing function play a more critical role in detailing design.[6] However, generally, they are not emphasized enough in formal architectural education.[7]

Design Factors	Explanatory Questions
Environment	To which environmental influences is the project subjected during the construction and operation? (Temperature, humidity, vibration, etc.)
	Is there an environmental effect that should be especially considered in the design process?
Function	Which function(s) does the project/ building element/ detail have to fulfill (e.g., thermal and humidity control, ventilation and air tightness, light control, acoustics)?
Performance	By what parameters will the functional characteristics be assessed? (e.g., speed, power, strength, accuracy, capacity)
Size and weight	Does construction or use put limits on the dimensions or weight? Explain the potential constraints.
	Is there a dimensional variety in design? Does the dimensional variety impose requirements on the detail?
Materials	Are specific materials necessary? Are certain materials not to be used?
Ergonomics	Are there any requirements about ergonomics (e.g., perception, use, handling) the design must meet?
Health	Which design features are needed to provide a healthy indoor environment?
Safety	Should any special features be provided for the safety of the users or nonusers?
Aesthetics, Appearance, and Finish	What are the aesthetic preferences? Should the design fit in with any architectural style or concept?

Social and Political Implications	Is there a social idea that the design should reflect?
Regulations and Standards	Which regulations apply to the design and its production? Are they bring any constraints to the design?
	Which standards apply to the design and its production? Are they bring any constraints to the design?
Testing	To which functional and quality tests is the design submitted? What are the on-site tests subjected to mock-ups?
Life in service	How long does it have to last?
Target construction cost per unit	What is the limit value of the cost of construction to be invested?
Quantity	What is the size of the construction?
Manufacturing	Does manufacturing of any building product impose a constraint on the design (e.g., custom manufacturing, product availability, production time and capacity, location of manufacturing facilities)?
Assembly and installation	Which requirements are set by assembly or installation of the building products? Specify tolerance requirements.
Storage	Are there periods of time in which building products are stored during production and distribution? Does it require specific measures?
Transportation	What are the requirements and constraints of building products' transportation?
Operation	Which requirements are set by operation or use?
Maintenance	Is maintenance necessary and available? Which building products have to be accessible?
Reuse, recycling, and disposal	Is it possible to prolong the material cycle by reusing materials or parts?
	Can the materials and parts be separated for waste disposal?

Table 1. Design factors checklist

Phase II: Defining the building products

The purpose of the second phase is to recognize building products and to increase building product knowledge. At this phase, the reproduction of detail drawings is performed. Published drawings are scaled and converted into measured 2 or/and 3 dimensional drawings in a computer-aided design (CAD) and drafting software. This also helps those who have little experience in detail drawing to learn the detail drawing standards. A reproduced detail drawing is given at Figure 2.

Figure 2. Renovation project of students' apartments at the Olympic Village, Munich[8]; reproduced terrace detail in section and perspective

Detail drawings follow the same principles as scheme design and working drawings: in order to present an entire building, it is necessary to show layout plans, sections, and elevations.[9] It's also essential to present a detail from various angles in order to show all relevant parts of it as a small part of the whole.[10]

Learners, who have little experience with detail drawings, often have a hard time reading them. The two-dimensional nature of detail drawings can make it difficult to distinguish what is drawn in plan versus what is drawn in section or elevation.[11] For this reason, similar products are colored with similar colors and the position of the building product and its relations with other building products are followed in different drawings.

Information about building products is obtained from annotations or hatches of the drawings. If there is a building product unfamiliar to the learner, market research should be conducted to identify the characteristics of the product.

Phase III: Defining functions and joining methods of the building products

Each product that forms the building has a function, and detail design focuses primarily on how individual building products fit together.[12] In this context, the third phase aims to determine the functions and joining methods of the building products. This is achieved through reverse engineering conception. Reverse engineering is used in product redesign to reveal the properties and working principles of the existing products.[13] In this process, a product is observed, disassembled, analyzed, and documented in terms of its form, components, physical principles, functionality, manufacturability, and assemblability.

In this phase, a hypothetical disassembly is performed starting from the perimeters of the detail. One building product is removed from the system at a time and these questions are answered to define the joining method: which products it is connected to, and how it is connected to these products? Likewise, when a product is removed from the system, the question of which function is missing in the system is asked, and the missing function defines the product's function. With this hypothetical disassembly method, the assembly sequence is also defined from backward.

Implementing this phase can be confusing for novice users. Therefore, common joining methods are provided as a checklist (Table 2).[14] Also, DIN Standard for Manufacturing Processes- Joining can be used in determining the joining methods[15] (Figure 3).

Common joining methods			
Screwed	Filled	Push-fitted	Overlapping
Welded	Self-adhesive	Wedged	Unrestrained
Soldered	Riveted	Dovetailed	Under imposed load
Bonded	Nailed	Butt-jointed	Unrestrained
Pointed (with mortar)	Clamped	Rebated	Nonexpanding

Table 2. Common joining methods checklist[16]

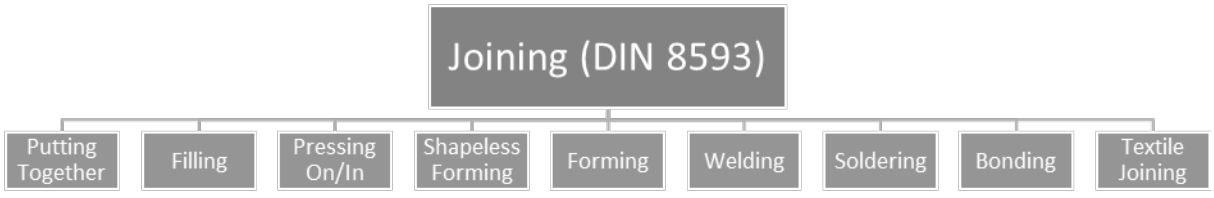

Figure 3. DIN Standard for Manufacturing Processes-Joining

Phase IV: Functional analysis of the detail

Regardless of the materials they are made of, building elements share various general features and common technical solutions, namely detail patterns.[17] A detail pattern can indicate fundamental strategies for achieving a specific building task for predefined functions, combining physical, chemical, and geometric impacts to develop an effective structure.[18] The last phase, phase four, aims to determine how the detail patterns are used to perform the functions of the detail. Thus, different usage areas of detail patterns will be learned.

There are five modules of detail patterns adopted from Allen and Rand[19]: controlling water (Figure 4), water vapor (Figure 5), air (Figure 6), heat flow (Figure 7), and sound (Figure 8). Application of these modules is need-based and nonsequential. Basically, it is investigated whether the detail patterns that can be applied to perform a specific function are used, and if so, how they are applied. An example of functional analysis of a detail drawing in the context of water control is given in Figure 9.

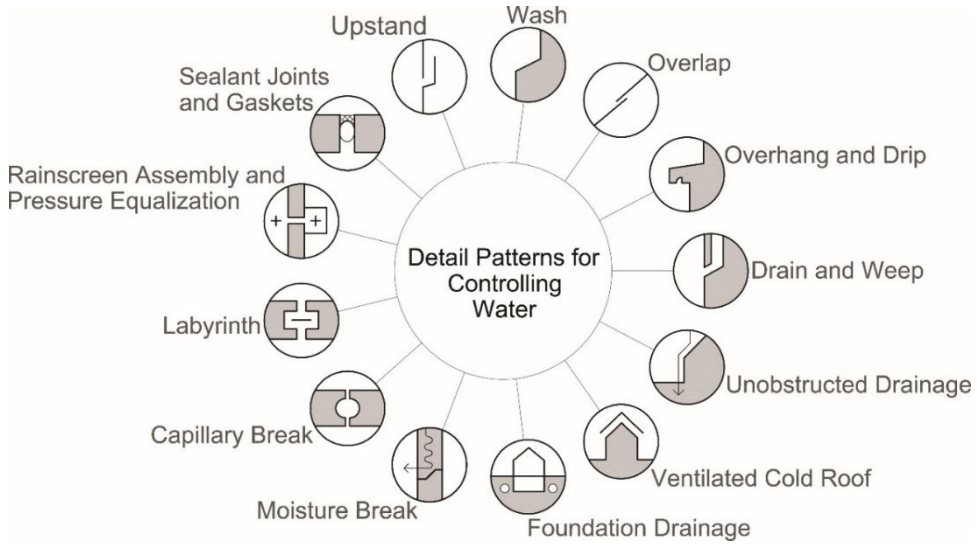

Figure 4. Detail patterns for controlling water

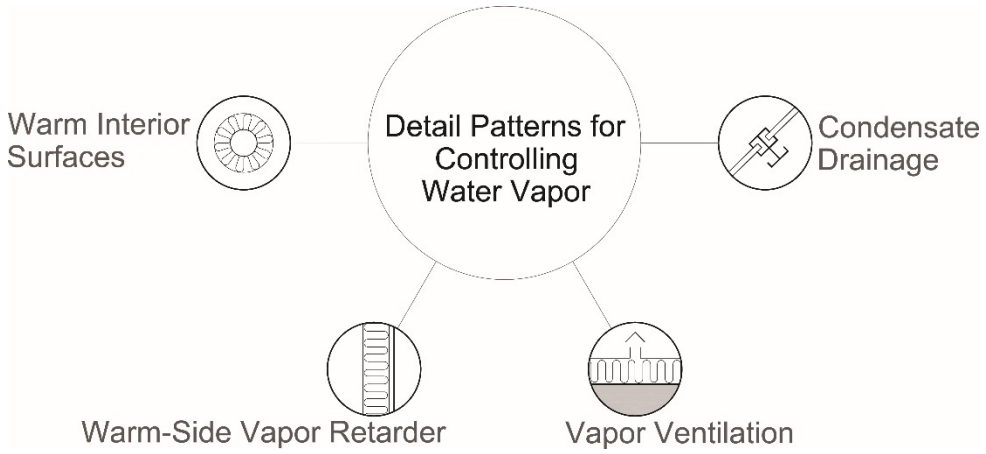

Figure 5. Detail patterns for controlling water vapor

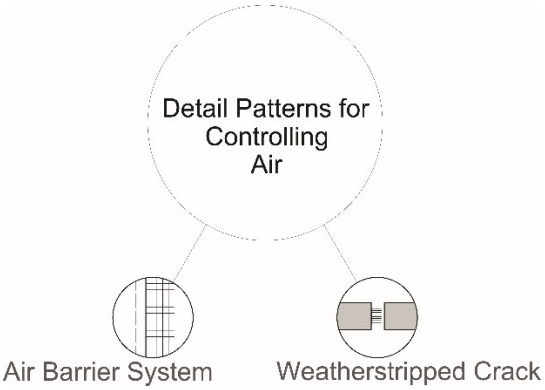

Figure 6. Detail patterns for controlling air

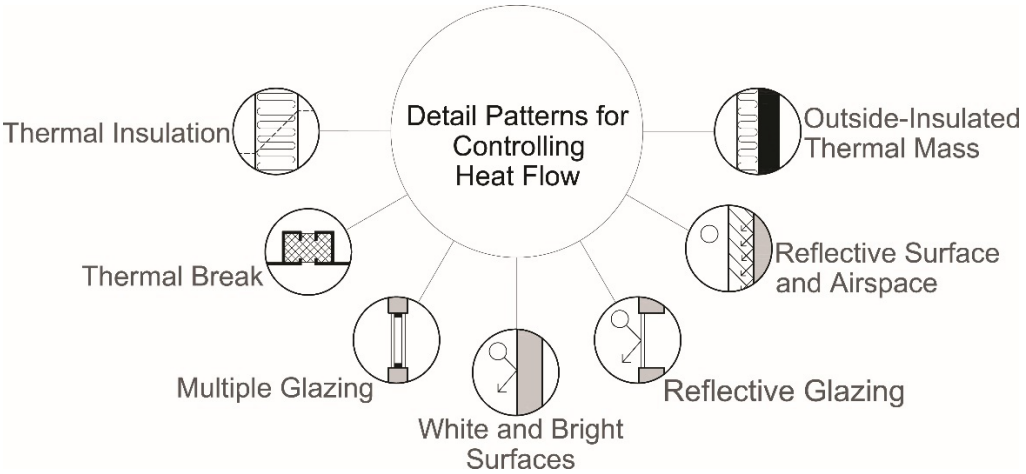

Figure 7. Detail patterns for controlling heat flow

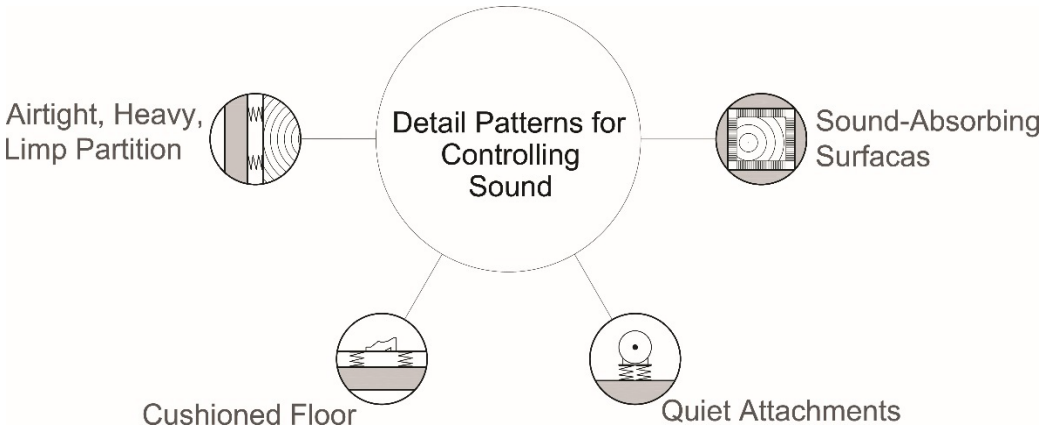

Figure 8. Detail patterns for controlling sound

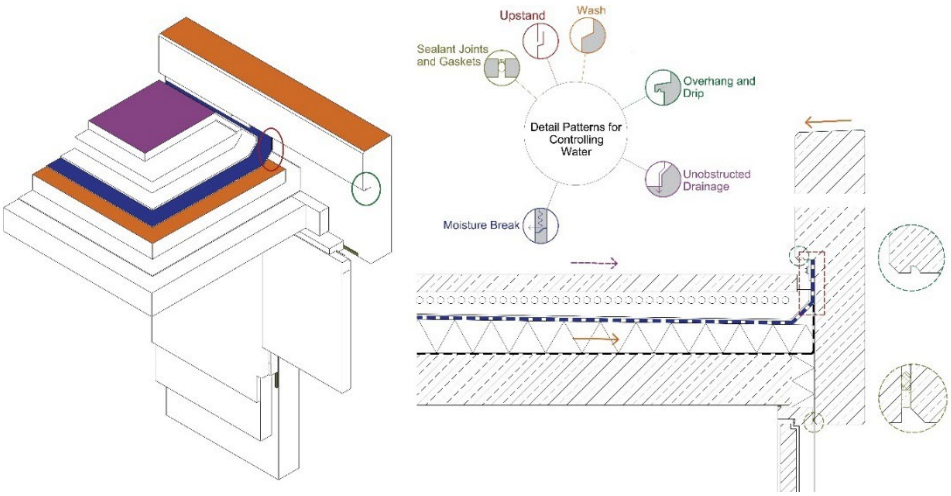

Figure 9. Renovation project of students' apartments at the Olympic Village, Munich[20]; terrace detail analysis for controlling water

CONCLUSION

Architectural detailing is a critical skill in practice for controlling the quality of design and assuring construction feasibility. Detailing links design and construction. Many architects invest in self-learning to improve their architectural detailing skills throughout their careers. However, not using a systematic method in this process prolongs the skill development process. In this context, this study aimed to reveal a systematic and target-driven self-learning method for architectural detailing through project analysis.

The project analysis method consists of four phases, employs a range of data collection methods, allows flexible data representation, and draws upon existing theoretical underpinnings. It is proposed to be used by an architect at any level of detailing expertise.

The application test of the method provided an insight into what might be encountered in practice. So, some points to be considered in practice have been determined. Learners should not proceed to the detail analysis without examining the context of the design and make assumptions about undefined building products. Identifying what is not known is also a form of learning outcome. Therefore, unresolved issues should be noted for further study. Also, analysis of complex details can be managed by breaking them down into sub-assemblies.

The method has many strengths. It is reliable; results are reproducible. Phases, checklists, templates, and patterns ease its application, which reduces the struggles of the self-learning approach. It is thought-provoking and ensures its users a keen eye for evaluating architectural details. Besides all the promising features, there are some limitations of the method. Learning outcomes cannot be isolated from the learning resources and level of expertise of the learners. It is still open for improvement and expansion, especially on detail patterns.

NOTES

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PHILOSOPHY, ART AND CREATIVE ASSESSMENTS: A PROPOSAL

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INTRODUCTION

Philosophy can be highly creative and there are deep connections between the history of the discipline, its contemporary forms, and various visual arts. Philosophy teachers use visual aids in class to communicate philosophical ideas and students use mind maps and YouTube videos to help them prepare for assignments and examinations. Philosophy, though, is assessed almost exclusively with the written word. This is unnecessary, alienates students with diverse learning needs, and distances academic study from the career paths of philosophy graduates. I therefore propose the introduction of more diverse assessment strategies into undergraduate philosophy courses. I shall first highlight the visual content of philosophy classes and instruction, and also briefly consider how visual artists can be seen as exploring philosophical issues. I shall then consider the advantages and challenges of introducing creative elements into assessments for philosophy degrees.

VISUAL ELEMENTS IN TEACHING PHILOSOPHY

I plan my philosophy lectures by sketching out a diagram of how the various topics I will discuss are related to each other, to the other lectures in my module and to other modules in the course. I then start to think about the broad structure of my PowerPoint presentation. Once I have a feeling for this I dive into the first slide. The first decision concerns the format, the colour, the font. Appropriate images are then chosen to help communicate the philosophical content of the lecture. The use of visual aids and examples from the history of art are common in philosophy classes and they can provide accessible illustrations of philosophical theories, arguments or claims. Last week in my philosophy of mind lecture I was discussing consciousness and I was looking for a striking example of what contemporary philosophers call 'qualia'. These are the private, qualitative aspects of experience, such as the way the sky looks or a peach tastes. Many paintings attempt to communicate such experience, but Manet's 'Oysters' is particularly striking.[1] One can almost taste the sharpness of the lemons cutting through the brine of the oysters. Further, my spoken exposition is constantly interrupted and accompanied by gestures and scribbles on the whiteboard: sometimes text, but often diagrammatic or visual. In clutching for examples to illustrate the philosophical theme of the lecture or to answer a question from the class, I often turn to the common currency of films, YouTube or TV (I am too old for TikTok!): in a lecture on Cartesian scepticism, for example, I may summarize the plot of a *Rick and Morty* episode; perhaps drawing a diagram of the worlds within worlds scenario of 'The Ricks Must be Crazy'.[2] Pre-planned embedded videos in PowerPoint presentations—if well-

chosen—can also be helpful and give the students a rest from my spoken, acted and visual exposition.[3]

The incorporation of visual elements into philosophy classes is not new. In the early modern period students were encouraged to think through spatial and visual metaphors and analogies in order to articulate philosophical theories. In *The Art of Philosophy*, Susanna Berger discusses how early modern thesis prints or broadsides visually summarized university philosophy courses, and Chéron and Gaultier's *Typus* contains a particularly pleasing visual representation of Aristotelian philosophy of mind. A boy picks flowers (representing sensory input), and hands these to a girl (labelled 'Apprehension'), who processes this sensory information and passes the flowers on to a seated woman, who binds them together into a wreath, symbolizing the combining of concepts into propositions.[4]

ARTIST-PHILOSOPHERS

In 'Philosophy and the Visual Arts: Performance and Illustration' and 'Philosophy, Pedagogy and Visual Art' I distinguish various ways that artists can be seen as exploring philosophical issues.[5] Works can aim to illuminate a philosophical question or they can be philosophical even if this is not the intention of the artist. There are also times when an artist philosophizes *through* the creation of images—their artistic practice a form of philosophy.[6] Such art does not merely raise philosophical questions or prompt philosophical reflection, but philosophical ideas or conclusions are, in some sense, to be found in the artworks themselves or in the acts of creating them. One way to think about such a possibility is to consider certain kinds of conceptual art, where *the idea* becomes primary. Marcel Duchamp's 'Fountain' (1917), better seen as a performance than an art object, involved his entering a latrine into the Society of Independent Artists exhibition in New York as a sculpture. The art is *the idea*, and the idea—or perhaps better, the *question*—is a philosophical one, concerning the nature of art and of artworks, and the role played by the gallery space and spectator in conferring that status. 'Fountain' should not therefore be seen merely as a counter-example to a particular attempt to offer necessary and sufficient conditions for something to be a work of art, but as undercutting *any* attempt to offer a definition of art.

ASSESSMENT IN PHILOSOPHY

We have seen, then, that philosophy teachers and philosopher-artists use a wide range of visual strategies to communicate ideas. When it comes to assessment, though, the visual takes a back seat. Most philosophy is still assessed by a single kind of production: the essay. Lecturers provide guides to how to approach and write these pieces of work and these are prescriptive: an essay should have an introduction, a narrow focus, and it should first look at arguments in support of a certain thesis, then at problems, and then arrive at a conclusion. There have been some moves away from this format, with PowerPoints or mind maps sometimes used as assessments and here I suggest further exploration of how more diverse assessment strategies could involve visual elements.

Such diversification could be pedagogically advantageous in various ways. First, almost all philosophy graduates in almost all philosophy departments do not become philosophers, or write philosophy ever again, or, for that matter, write an *essay* on any topic ever again. It's worth pausing on this point… Philosophy enriches lives, it inculcates academic skills and many intellectual virtues, but the specific assessments we use to assess students are in many cases divorced from the lives and careers those students will lead after graduation. This alone is good reason to diversify forms of assessment. Part of the job of a philosophy teacher should be to provide their students with the kind of skills they may need in their careers, those involving creativity and the ability to communicate difficult ideas and concepts to a diverse audience and some assessments should be designed in accordance with this aim.

Second, artificial distance between teacher and student can be suggested by the mismatch between how philosophy is taught and how it is assessed. Communication of philosophical ideas can be imagistic and creative, whereas assessment has prescribed boundaries and is wholly text-based. Occasionally a student has tentatively asked whether it is OK to use an image in their essay, and when they do so the monolithic nature of assessment in philosophy is highlighted. It is surely odd that we ask students to convert all their philosophical understanding into essay form, given that images have played various roles in enhancing their study and knowledge of philosophy.

Third, assessing essays is reasonably easy, at least with experience. As a consequence one rarely engages philosophically with an essay, that is, it is highly unusual for an essay to make the teacher think again about a topic or see it in a different light. This, perhaps, would not be the case with creative assessments. Teachers would be invited to engage with the piece of work in its own terms, and in doing so they would have to step out of their comfort zone. Marking need not be a chore; it can become part of one's philosophical life.

I do not mean to imply that essays are a poor way of assessing understanding; they are just not the only way. There are other ways to express one's understanding or critique of a theory. I focus here on visual art because, as suggested, there is a long history of collaboration between artists and philosophy, but also because it is an interest of mine—both with regards to its history and philosophical content, but also as an (amateur, self-taught) artist.[7] I am suggesting, though, a pluralistic approach to assessment: students could be asked to explain and critique a theory through a short story, a dramatic performance, a song, or a video game.

CHALLENGES

The principle challenge for my proposal concerns expertise in assessing creative work.[8] How can such visual assessments be assessed, or how can they be assessed by philosophers? Philosophy lecturers are trained in writing essays and there are clear marking schemes that can be communicated to students. Feedback can therefore be precise. A student can come away from a module knowing that their use of appropriate sources has improved, but that they still need to put further work into their referencing. As well as formal feedback, lecturers also offer their own hints and tips for the writing of essays and dissertations and their own strategies for how to get ideas down on paper and develop arguments. There are templates that can be followed: classic essays that should be read by all students, those that successfully communicate certain philosophical ideas, but also those that are written in a style that should be emulated. Such assessment, feedback and engagement with canonical texts becomes second nature to philosophy teachers, but this would become much more daunting in the context of creative assessments. Just how would I mark a group assignment in which small groups are asked to collect found objects and construct an assemblage that illustrates Hume's problem of the missing shade of blue or the argument from illusion? How do assessments of the philosophical idea communicated, the creativity involved, and the artistic skill applied, contribute to the overall mark? Could a beautifully crafted, creative take on a rather mundane philosophical idea ever trump a piece that has more substantial philosophical content, but that is less creative or less skillfully realized in artistic terms?[9]

Bruce Nauman's 'Concrete Tape recorder Piece' (1968) consists of a tape recorder encased in concrete with its power flex emerging from a hole at the side. I have used this in class to illustrate George Berkeley's (1710) idealism and the claim that the world consists only of ideas in our minds and those of God. His theory is often introduced with a question concerning whether a tree falling in a forest would make a sound if there were no-one there to hear it. Well… are there sounds inside the concrete if no one can hear them? In the classroom we have 18th Century idealism alongside postmodern art—both difficult, but each can illuminate the other. But what mark would I have given Bruce Nauman if he had submitted his *Tape Recorder Piece* for his 'dissertation'?

It should be noted that such questions are also encountered with respect to wholly textual assignments. A beautifully written essay can be given a higher mark than one that doesn't quite hit the philosophical heights of another essay that is poorly written. Marking schema are divided into distinct criteria—'Knowledge and Understanding' in a different column from 'Writing Skills and Presentation'—but this is in some ways artificial. Good writing contributes to the clear presentation of argument and so there is no determinate algorithm to convert component marks into an overall mark. This is down to the judgement of the teacher, and one learns to make such judgments with practice. Philosophy teachers come to acquire the skill to be able to judge how the particular criteria contribute to the overall mark in a particular essay and they become good at doing this with respect to written assignments. The problem concerning the assessment of creativity therefore becomes deeper. It's not just a matter of assigning a mark to the creative element, but also of judging how this creative element is integrated with the philosophical elements of the assignment.

The proposal, then, is to take it slow. It's not just a question of introducing an optional artistic assessment into a module. There needs to be dialogue between philosophers, educationalists, artists, historians of art, employers and the students themselves, in order to consider such problems and the details of any such proposal.

A FUTURE VISION

The vision is for the assessment of students in philosophy to include creative elements that can demonstrate their understanding of and critical engagement with a topic, and their ability to communicate this understanding to others. Artworks could therefore become catalysts for philosophico-artistic investigations in class. Coincidently, as I was completing this paper I received an email from a friend of mine ('htnc' [how the night came], his artist name on *bandcamp*). I had sent him a link to my art webpage. The paintings inspired by Descartes' meditations caught his eye and he composed some ambient electronic music to accompany them. Htnc explained to me how he 'sliced ['Meditation 6'] into five strips, fed the images into photosounder, then converted the resulting .wav files to MIDI (quantized to 16ths). i used the MIDI clips separately to trigger various samples: kick; snare; low tom; floor tom; hi-hat. i added a steady hi-hat pedal to help navigate the slightly offbeat rhythms. Finally, i layered in a live guitar piece (played through VCV rack]'.[10] This was wonderfully exciting—ambient music was being composed over the other side of the globe (htnc lives in Japan) based on my paintings, themselves inspired by the meditations of Descartes, 300 or so years ago. This synergy between a philosophy text, painting and music went on to inspire further philosophical reflection by the composer, and then, via email, by me…and then, hopefully, in my Early Modern Philosophy class. Htnc was led to think about whether a piece of music that 'is only one minute long…can be called "ambient"? more generally, can such a brief composition claim to establish a mood or atmosphere? (Wittgensteinian thought: i can claim to have felt sad for one minute, but not to have been depressed for one minute. certain moods or states require longer stretches of time to operate)'.

Could creative assessments be used to create such synergies within classes, perhaps between students on different courses or across institutions and borders.[11] I intend to explore whether they can…

NOTES

[1] Édouard Manet, 'Oysters' (oil on canvas, 1862, National Gallery of Art, Washington DC).
[2] Series 2, episode 6.
[3] On YouTube there is a wonderful cartoon rendition of Plato's allegory of the cave from 1973, narrated by Orson Welles: //www.youtube.com/watch?v=QFi8JUIwu2s.
[4] Susanna Berger. *The Art of Philosophy: Visual Thinking in Europe from the Late Renaissance to the Early Enlightenment*. Princeton: Princeton University Press, 2017: 98–9.
[5] O'Brien, Dan "Philosophy and the Visual Arts: Performance and Illustration," *Human Affairs* 31(4) (2021): 496–507; "Philosophy, Pedagogy and Visual Art," forthcoming in *Anejos de Imago*. These papers have their origin in earlier work at the intersection of the history of art and philosophy, where I explore how Kantian themes can be found in cubist works (O'Brien, "Cubism and Kant," *Proceedings of the European Society of Aesthetics* 10 (2018): 482–506) and how the works of Caravaggio can be seen as illuminating different kinds of empathy (O'Brien, "Caravaggio, Empathy and Christ," *The Heythrop Journal* LXI (2020): 437–46).
[6] For discussion of how early modern still life painting can be seen as a form of philosophical reflection, see Hanneke Grootenboer, *The Pensive Image*. Chicago: Chicago University Press, 2020.
[7] In O'Brien, "Philosophy and the Visual Arts: Performance and Illustration" and O'Brien, "Philosophy, Pedagogy and Visual Art," I give details of some of my artworks that engage with Descartes' *Meditations*, the issue of personal identity, and abstraction. See www.lowwintersun.org for my paintings and other art.
[8] See Birut Zemits, "Representing Knowledge: Assessment of Creativity in Humanities," *Arts and Humanities in Higher Education* 16(2) (2017): 173–87 for discussion of the problem of assessing creativity in student assessments.
[9] See Beth Hennesy and Teresa Amabile, "Creativity," *Annual Review of Psychology* 61 (2010): 569–98 on the psychology of creativity.
[10] The piece of music can be found here:
https://lllllllll.co/t/disquiet-junto-project-0544-feedback-loop/55883/14?u=howthenightcame
[11] Such an ambition is in line with recent developments in COIL (collaborative online international learning) projects. See https://onlineinternationallearning.org/about/.

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COLLAGE AS A TRANSDISCIPLARY LEARNING AND TEACHING METHOD IN A TIME OF INTERNATIONAL CRISIS

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INTRODUCTION

While teaching on the Fine Art programme at Cardiff School of Art and Design (CSAD) in Wales U.K., I delivered a five-week practice-based project entitled '*Digital Collage Universe*' as part of the 'transdisciplinary' module open to students across the school. Transdisciplinary learning and teaching can be defined as learning and teaching that goes beyond the students' subject discipline, integrating knowledge from other discipline areas, and also refers to the integration of higher education within wider society a process through which students learn to see how their work may bring positive contributions beyond their learning institution.[1] Using student reflection, this paper concludes that collage is a particularly effective method to promote remote transdisciplinary learning and teaching during a global pandemic and a national lockdown.

In total, thirty-nine students from six subject disciplines of Fine Art, Artist Designer Maker, Graphic Communications, Fashion Design, Textiles, and Product Design enrolled in the *Digital Collage Universe* project.[2] This is an appropriate mix for any transdisciplinary project, and these allowed for the crossover of ideas and practical approaches between the six discipline areas.[3] At this time Wales was experiencing its second national lockdown due to Covid 19 and the Welsh government had advised staff in higher education to carry out their teaching duties from home whenever possible to do so.[4] Accordingly, the collage project was re-designed, in its entirety, to be delivered entirely remotely using various delivery techniques[5] through Microsoft Teams.[6] As in previous years of on-campus delivery, the aim of the project was not only to familiarise students from a variety of subject disciplines with the methods associated with collage, but to do so in such a way as to enable these students to apply the methods within their own disciplines after the project has ended.[7] Due to the Covid 19 restrictions, all students would gather this knowledge while at home. Thus, in a wider transdisciplinary fashion, they worked on their university coursework while remaining socially responsible.[8]

THE COLLAGE TECHNIQUE

Reflecting on which art techniques to employ as a transdisciplinary learning and teaching method during a national lockdown, collage immediately sprang to mind. Collage is a creative method in which printed matter is cut up and stuck together to make new compositions.[9] In the early years of the 20th century collage was considered a hobby done at home, rather than as a way of making important works of art. Such a pastime was not considered to require a large studio or specialist materials and

equipment. Later, historical artists such as Hannah Höch and Pablo Picasso were known to use collage at home while working outside their studios.[10]

The term 'collage' derives from the French word 'Coller', or 'to stick'.[11] Providing students enjoy access to ordinary household items such as paper, a pair of scissors and glue - they can carry out a collage project.[12] In recent decades artists have taken to their smartphones, games consoles, computers and the internet, which are also increasingly considered ordinary household items, to make artworks.[13] These media have extended the resources available to students. No large studio is needed to make collages. Rather, the only space required is that of a cutting mat on a tabletop and / or the memory contained within a phone or computer. Today, collage remains an art method well suited for working at home.

Based on historical and contemporary practitioners of collage it was decided that collage could be used as a method for remote transdisciplinary learning and teaching during a national lockdown.

PROJECT DESIGN

Digital Collage Universe was designed around the restrictions necessitated by the lockdown. The project needed to be fully inclusive; and, due to the transdisciplinary nature of the module, it also had to cater to students from a range of up to thirteen subject disciplines taught at CSAD. Students may or may not have used collage techniques before. The project was advertised to students on the basis that prior skills were not needed, and that access to digital image media was recommended but not essential. If students did not have access to digital media, they were able to create collages using traditional paper techniques. All students could be included.

The teaching content of the Digital Collage Universe project was structured around three practical 'Collage Challenges' based on my art practice. In addition to these challenges students were asked to complete a 500-word project reflection paper in which they recorded what they had learnt through the project. The project reflection papers proved a valuable resource. All student feedback cited below is drawn from these project reflection papers.

To fulfil the three Collage Challenges the students were required to create: 1) a collage triptych; 2) a set of photomontages; and 3) a set of collaborative collages with a partner from the cohort. Each challenge was introduced through a keynote lecture that discussed artists and designers from various subject disciplines who use collage to different ends. This made certain of a collage-centered transdisciplinary context from which students could draw inspiration for their own work.

FIRST CHALLENGE: COLLAGE TRIPTYCH

The Collage Triptych was the warmup exercise. Its aim was to introduce students to the basic techniques of collage. Students were shown 250 examples of my collages through a 'Bunk' lecture.[14] Students were then asked to create a set of three collages on A5 sheets of paper or an A5 digital format. The first of these had to be a drawing without any collaged elements; the second was a combination of drawing and collaged elements; and the third was to be made of collaged elements only. Students were also encouraged to draw on ideas they were exploring in their subject disciplines for inspiration, and to use local newspapers and packaging from items in their houses for collage elements. If students wanted to make a digital collage triptych, they were encouraged to use online public domain image archives as a source for collage elements. These pointers ensured that students could complete the tasks without having to leave the house to gather collage materials. I found that the Collage Triptych also worked well as a confidence builder at the beginning of the project because it began by utilizing a method with which any art and design student is familiar with (drawing) before transitioning - in three simple stages - into a method with which they may or may not be familiar with (collage).

Figure 1. An example of a digital collage triptych created by a Fashion Design student; the image on the left is a drawing, the center image combines drawing with collage elements from Google Images, and the image on the right uses collage elements from Google Images only.

Figure 2. An example of a non-digital collage triptych created by a Textiles student; the left image is a drawing; the center image combines drawing with collage elements; and the image on the right uses collage elements only.

STUDENT FEEDBACK ON THE COLLAGE TRIPTYCH CHALLENGE

A Fine Art student: "[The collage triptych] allowed me to experiment with combining different media and create layers and texture within my work…. I began to produce a series of collages by collecting and sourcing materials from packaging, magazines, receipts, labels etc. … I enjoyed working with and using materials … that would normally be discarded of and repurposing them into art as a method of recycling/upcycling."

A Fashion Design Student: "The collage triptych offered me the opportunity to blend elements of my own creative prowess with current affairs that I view as relevant to myself. In creating a collage using my own photos, photos that I found online and adding my own flair, I was able to make 3 collages that were highly relevant to the Black Lives Matter movement in the UK which has tied in perfectly with my subject [discipline] focus within fashion design as well."

The above overwhelmingly positive feedback suggests that the Collage Triptych Challenge achieved its aim. Students in Fine Art who had used collage previously found that they were able to create collages using materials found at home; while other students – such as those in Fashion Design - who (anecdotally) had not used collage were comfortable with it having completed the challenge.

Importantly, students began using collage as a way of exploring ideas of broader importance to their disciplines, as well as voicing concerns with global current affairs (Fashion Design).

SECOND CHALLENGE: PHOTOMONTAGE

In the next Collage Challenge students were asked to create a set of at least three photomontages that incorporated photographs from different sources. Photomontages are created by putting together multiple photographs to form one visually coherent image.[15] The instructions were as follows: one photomontage had to be made from found photographs (from magazines, newspapers or online sources); one photomontage had to be made from photographs taken by the student; and one photomontage had to be made from a combined mix of found photographs and photographs made by the student.

Using the internet as an image source guaranteed that students could continue to develop their collage work without having to leave their homes. Students were encouraged to use applications on their phones, computers, or even Nintendo Switch.[16] Like the Collage Triptych, students were encouraged to use the Photomontage Challenge to explore ideas that they were working with in their disciplines.

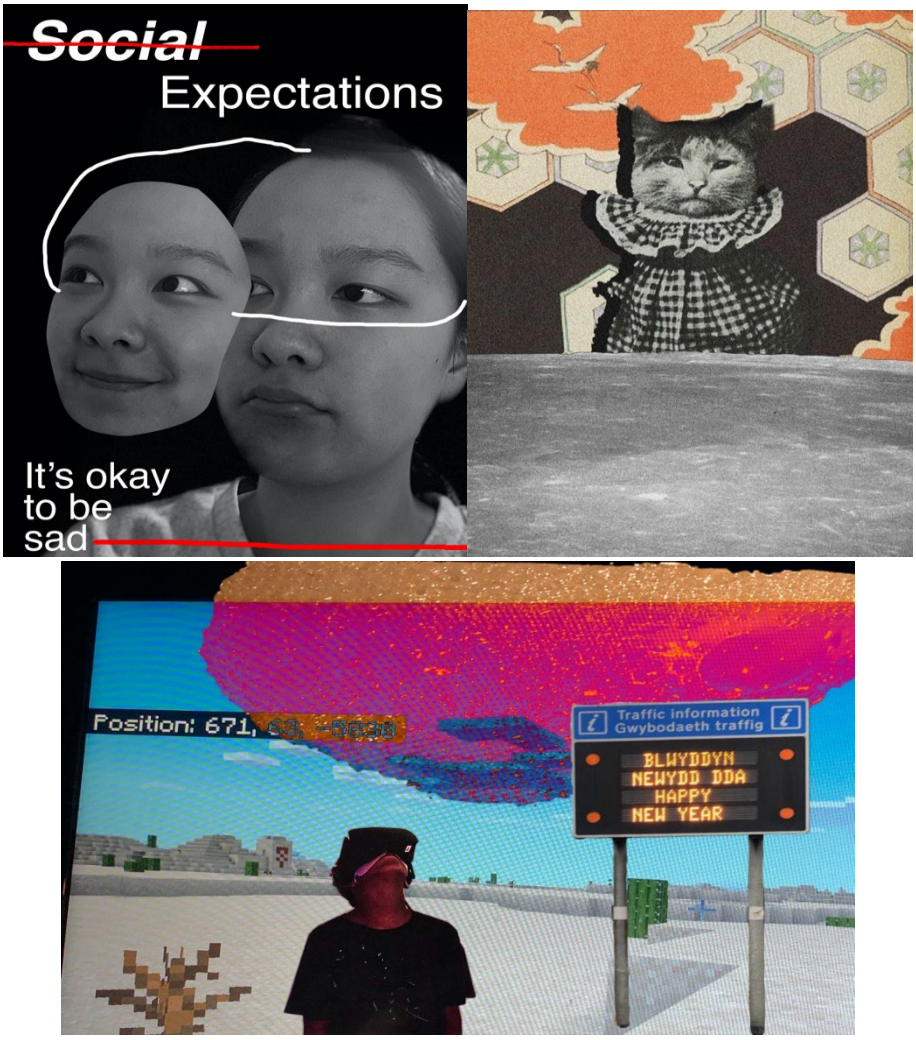

Figure 3. Top is a photomontage made of photographs found using online databases. Middle is a photomontage made of photographs made by the student. Bottom is a photomontage made of photographs found using online databases combined with a screenshot photograph of a video game made by the student.

STUDENT FEEDBACK ON THE PHOTOMONTAGE CHALLENGE

A Fine Art student: "… I feel that I spent a lot of time practicing and learning on photoshop to enable myself to create an interesting range of collages … Using photoshop … allowed me to come out of my comfort zone and create more ideas. A technique that I used a lot throughout my work was cutting. This consisted of cutting by hand but also cutting on photoshop using the lasso tool. This was a new technique that allowed me to create interesting compositions that I will use in other projects … ".

A Graphic Design student: "I really like my "Social expectations" collage [shown above] as it is not only a collage, it also involves a message behind the visual presentation … Therefore, I [will] incorporate this in my Graphic Communication subject designs to improve the quality of my work."

The Photomontage challenge tested student's digital skills, particularly using Adobe Photoshop. Although students were given the same set of instructions, their previous subject discipline knowledge and skills ensured different collage outcomes. Compared to Graphic Communication students who were familiar with Photoshop, many Fine Art students – who had previously used physical cutting and pasting skills to make collages - were new to, or relatively inexperienced with, the digital tools of Photoshop.

THIRD CHALLENGE: COLLABORATIVE COLLAGES

To keep physical contact to a minimum, the internet was used as a resource to make collaborative collages. Each student was paired with someone from another discipline and asked to email five images from an online source to their partner. Each student received five digital images. They were given a choice either to print these so as to create physical collages, or to use the same images to make digital collages employing the new skills they had recently acquired in the Photomontage Challenge.

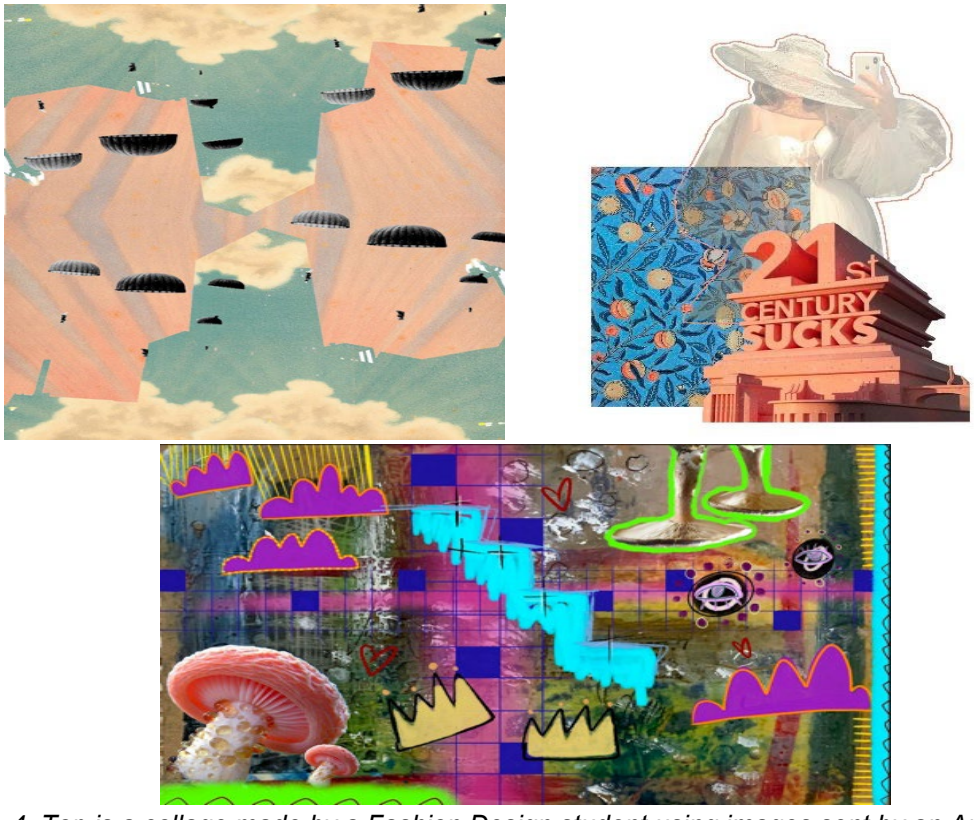

Figure 4. Top is a collage made by a Fashion Design student using images sent by an Artist Designer Maker student. Middle is a collage made by a Fine Art student using images sent by a Graphic Design student. Bottom is a collage made by a Fine Art student using images sent by a Textiles student.

STUDENT FEEDBACK ON THE COLLABORATIVE COLLAGE CHALLENGE

A Textiles student: "I found the third collage challenge the hardest as the images my partner sent me did not go with my theme ... I experimented with combining the images to a digital collage but I wasn't happy with any of the outcomes until I tried creating a cityscape in the style I was experimenting with and this made me feel like I had produced a successful outcome."

A Fine Art student: "I found [the collaboration] hard because the photos I had sent my partner were the ideal images for me to collage with and found the lack of control quite frightening … and I was concerned that there would be a lack of quality … I still believe that this partner work was a needed route to explore, to force me out of my comfort zone …"

Generally, students found the Collaborative Collage Challenge the hardest of the three Challenges. Most students were forced out of their comfort zone by the images sent to them by their partners, with some students finding the loss of control over the image selection process frightening. One idea that was regularly expressed in the student project reflection paper was that they experienced the foreign images to be - in some way - in tension with their own ideas. Students had to adapt their previous ways of thinking in order to make collages with these images; and most understood that the aim of the exercise was to test the boundaries of their own creative thinking. The resulting collages show that all students managed to overcome their initial anxieties to create surprising pieces of work which is borne out in the reflections above.

Through the collaborative collage challenge students were able to make transdisciplinary collaborations with their peers without leaving the house and without coming into physical contact. The collaborative process led students, first, to reconsider their ways of working and, second, to adapt their ideas based on the thinking of a peer from another subject discipline. Surprising artworks resulted. The aim of this activity was both to demonstrate to students the need for risk in the creative process, and to consolidate their understanding of the value of transdisciplinary collaboration.

PROJECT CONCLUSIONS

Digital Collage Universe was successful as a creative practice-based transdisciplinary project. Students learnt new skills and methods from outside of their discipline areas; students felt that that these skills and methods could be applied to their future work. Throughout the project, students used previously learnt discipline-specific skills and methods to enhance the work they made for the Digital Collage Universe project (examples below). Students also benefitted from the opportunity of collaborating with peers from outside of their discipline areas. Most importantly students were able to benefit from transdisciplinary learning and teaching in a way that was safe for themselves and people in their community during a national lockdown and global pandemic.[17] The feedback below confirms that students found the transdisciplinary aim of the project meaningful even though all interactions had to take place at home, through a screen.

Figure 5. The work of a Textiles student who used physical collage techniques to explore weaving methods in their Textiles work.

Figure 6. The work of an Artist Designer, Maker student who explored ideas in ceramics by digitally collaging parts of disparate ceramic objects together.

Graphic Communications student: "I definitely think that I will be able to take some new techniques I learnt within this project, back and into my subject [discipline]. I … would like to try and incorporate more physical collage into my future work … rather than sticking to only digital."
Textiles student: "During this project I have experimented with a range of collage styles including hand drawn, weaving, digital collage and an abstract drawn style. … I will begin to create more designs using digital techniques as I like that style and think it would work well on surface patterns and in interior settings. Overall I am pleased I was able to do the digital collage module and I have learnt a lot that will help develop my future work in my subject [discipline]."

Students finished the collage project feeling that they had learnt new skills and methods which they could apply to their work in the future. The Textiles student describes how the skills that have come from outside of their discipline area will be used to enhance and diversify future Textiles work. The Graphics Communication student that already possessed specialist digital skills will now also use physical skills learnt in Digital Collage Universe.

This project has shown that collage is an effective transdisciplinary learning and teaching method that can be used in a time of a global pandemic and national lockdown. The project fulfilled the general aim of the module descriptor[1], using learning and teaching that went beyond students' subject discipline and integrated knowledge from other subject discipline areas.[18] Students developed an understanding that subject disciplines are constructs and that their boundaries continuously change, merge and cross over with other subject disciplines. The project integrated perspectives of multiple disciplines to connect diverse fields of knowledge and deepen understanding. Lastly, the Digital Collage Universe project enabled the broader transdisciplinary integration of higher education with wider society as students were able to thrive creatively, making the various work necessary to pass the Collage Challenges while caring for themselves and society by following lockdown regulations to not risk contracting or spreading Covid-19. [19]

NOTES

[1] Daniel Lang, and Roland W. Scholtz, Michael Stauffacher, Alexander I. Walter, Arnim Wiek. "Transdisciplinary case studies as a means of sustainability learning: Historical framework and study." International Journal of Sustainability in Higher Education, 7 (3) 226-251 (2005) https://www.researchgate.net/publication/285828650_Transdisciplinary_case_studies_as_a_means_of_sustainability_learning_historical_framework_and_theory; Sue McGregor, L.T. "Transdisciplinary Pedagogy in Higher Education: Transdisciplinary Learning, Learning Cycles and Habits of Minds." Transdisciplinary Higher Education, 3-16 (2017). https://doi.org/10.1007/978-3-319-56185-1_1.

[2] Students from the disciplines of Animation, Illustration, Photography, Interior Design, Architecture, Architecture Design Technology, and Ceramics did not enroll on to the project.

[3] Ji-Yong Park, and Jeong-Bae Son. "Transitioning Toward Transdisciplinary Learning in a MultidisciplinaryEnvironment." *International Journal of Pedagogies and Learning*, 6 (1) 82-93 (2010). https://doi.org/10.5172/ijpl.6.1.82.

[4] Higher Education Coronavirus Guide: https://gov.wales/higher-education-coronavirus-guide#section-53834.

[5] Stefan Hrastinski. "Asynchronous and Synchronous E-Learning." *Educause Quarterly*, 31 (4) (2008) 51-55. https://er.educause.edu/-/media/files/article-downloads/eqm0848.pdf.

[6] Microsoft Teams is a digital interface where meetings, lectures and classes can take place through computers and other devices using the internet.

[7] Irene Shanker, and Sarah Wall. "Adventures in Transdisciplinary Learning." *Studies in Higher Education*, 33 (5) 551-565 (2008). Https://doi.org/10.1080/03075070802373008.

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[9] Naydene de Lange, and Fumane Khanare. "'We Are Never Invited': School Children Using Collage to Envision Care and Support in Rural Schools." *South African Journal of Higher Education*, 37 (1) 1-11 (2017). https://doi.org/10.15700/saje.v37n1a1271.

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[13] Susanna Bay, and Vivian Chen, Wendy Goh. "Young School Children's Use of Digital Devices and Parental Rules." *Telematics and Informatics*, 32 (4) 787-795 (2015). https://doi.org/10.1016/j.tele.2015.04.002; Martin Gayford, and David Hockney. *A History of Pictures* (London: Thames & Hudson, 2016), 339; Olli Tapio Leino, and Sebastian Moering. "Super Mario: The Quest for Authenticity." Paper presented the Replying Japan Conference, Kyoto, Japan, May 21-23, 2015.

[14] The format of this lecture was based on Eduardo Paolozzi's Bunk Lecture of 1952, delivered at the Institute of Contemporary Arts in London. Following Paolozzi's example, I showed 250 of my own collages in a seven-minute lecture; These can be viewed on my Instagram feed @jamesgreenufo.

[15] Stas Goferman, and Ayellet Tal and Zelnik-Manor Lihi. "Puzzle-Like Collage." *Computer Graphics Forum*, 29 (2) 459-468 (2010). https://doi.org/10.1111/j.1467-8659.2009.01615.x.

[16] The Nintendo Switch has a screen shot button to take photographs of games which can then be emailed, saved, and used as a piece of digital collage material.

[17] Sue McGregor, L.T. "Transdisciplinary Pedagogy in Higher Education: Transdisciplinary Learning, Learning Cycles and Habits of Minds." Transdisciplinary Higher Education, 3-16 (2017). https://doi.org/10.1007/978-3-319-56185-1_1.

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HOW DO OLDER ADULTS GAIN DIGITAL LITERACY DURING COVID-19?: BRITISH COLUMBIA AS A CASE EXAMPLE.

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INTRODUCTION

Information, services, and resources for older adults have been moving online even before COVID-19. Older adults are considered among the most vulnerable populations to the global pandemic. Due to safety concerns and the requirement of social distancing, even more information, services, and resources for older adults have moved online. However, many older adults have challenges accessing technology. Referring to Statistics Canada, in 2016, only 68% of older adults accessed the Internet, while the percentage was 100% for other age groups aged 19 or above.[1] This raises concerns about the digital divide between older adults and different age groups. Dijk[2] suggested digital divide refers to the divides among groups of people on accessing technology. Previous literature on the digital divide mainly was on between developed and developing countries,[3] men and women[4], and urban and rural populations.[5] However, there is emerging literature on the divide between older adults and other age groups.[6] Some literature argues that the digital divide is a human right.[7] An essential element of human rights is the right to have basic needs fulfilled to survive.[8] Living in a technological world, accessing technology is a necessity to survive.

The are various reasons why these older adults have challenges accessing technology. According to a recent report by Simon Fraser University in Canada[9], the primary reasons include lack of access to technological equipment and the Internet and lack of knowledge and skills to use the technology. This article will discuss the latter challenge. Many older adults have limited opportunities to learn technology in their earlier lives. Still, they live in a world in which they need to use technology now, so there is a need for older adults' digital literacy learning.

Most literature focuses on learning digital literacy in children,[10] young people,[11] and adults.[12] There is limited literature on digital literacy learning in the context of older adults. This literature suggested the need for education on technology for older adults.[13] For example, the study by Golomski[14] with older adults living in rural and peri-urban subsidized housing in the United States suggested the lack of access to education on the technology of this population. Van Jaarsveld[15] raised the need for more education on technology, especially since COVID-19. Seifert and colleagues discussed the lack of technology education in a long-term care context. Some literature took a further step by suggesting what digital literacy for older adults looks like. For instance, Blazic and Blazic[16] indicate that education about tablets and smartphones should consider the physical and cognitive limitations of older adults and their enjoyment of using these technologies. Ma, Chan and Teh[17] suggest that older

adults learn best how to use technological devices when working with other people and observing how they use the devices (as opposed to self-learning, which is common among the younger population.) Betts, Hill and Gardner[18] suggest that older adults learn how to use technology best if the education is personalized to their learning needs and interests and is conducted one-on-one.

From our practice experience in community-based senior services in Vancouver, British Columbia, Canadaearned that there are different experiences learning technology among older adults. Yet, as suggested, there is limited literature on older adults' technology learning, especially how they learn technology. Therefore, we are interested to learn more about how older adults learn technology during COVID-19. We propose the research question: How do older adults learn digital literacy in British Columbia, Canada?

TERMS

To begin with, we would like to clarify some terms. The first one is digital literacy. Since the location of our study is in British Columbia, we will refer to the definition adopted by the British Columbian Government.[19] "The interest, attitude and ability of individuals to appropriately use digital technology and communication tools to access, manage, integrate, analyze and evaluate information, construct new knowledge, create and communicate with others." Still, the definition of "technology" could be broad. Regarding the study by Betts and colleagues,[20] among the older adult population, the term "technology" is most commonly regard to be devices such as smartphones, tablets, and computers. We will adopt this definition of "technology." Considering that the Internet connection is required for many functions of the devices (e.g., browsing websites, video calls), we will also include the Internet in the definition of "technology."

Another term is older adults. We define older adults as people 65 years or above because this is the most common definition understood in society, probably because it is most widely used in government policies.[21] However, we want to acknowledge that different definitions exist. For example, some people aged 65 or over do not consider themselves older adults or people below 65 think of themselves as older adults.[22] Referring to the British Columbia Office of Seniors Advocates,[23] in 2018, 19% of the British Columbian population was 65 years old or above.

The last term is community-based senior services. We will present a study which chose to interview stakeholders in community-based seniors services. These stakeholders were selected because they are the primary service providers of digital literacy learning resources for older adults. According to United Way of British Columbia,[24] community-based senior service agencies refer to "a variety of municipal and not-for-profit organizations and agencies including seniors' centers, community centers, associations, community coalitions, ethnocultural organizations, multi-service non-profit societies, intermediary organizations, funders, and government bodies.".

There are currently no precise statistics on the number of community-based senior service agencies in British Columbia. However, we can estimate from different sources. One source is a recent study conducted by United Way of British Columbia[25] on the experience of community-based senior service agencies during COVID-19. It is a well-known provincial-wide study across the province, and therefore, many agencies participated. With reference to this study, there are 64 agencies participated. Among them, 24 agencies solely serve seniors, while 40 serve seniors and other age groups. (For example, a settlement service agency serves immigrants. However, they have senior programs providing services to immigrant seniors. Or a neighbourhood house serves different members in their neighbourhood. They have senior programs serving seniors in the neighbourhood.) Another source is the United Way of British Columbia Healthy Aging CORE Network,[26] the largest platform where community-based senior service agencies share resources in the province. The network's most prominent working group has 96 community-based senior service agency members. The number of community-based senior service agencies could be higher because some agencies may not participate

in the study or the platform. However, these sources at least give us an estimation. According to a recent United Way of British Columbia study on community senior service agencies and the United Way of British Columbia Healthy Aging CORE Network, approximately there are 100 agencies serving seniors in British Columbia.

THEORETICAL FRAMEWORK, METHODOLOGY, AND METHODS

This study is a part of a service enhancement study conducted between May and August 2020 in British Columbia, Canada, about information and referral service in community-based senior services. British Columbia confirmed the first case of COVID-19 in January 2020,[27] and this study was conducted at the beginning of COVID-19. This section will discuss the study's theoretical framework, methodology, method of inquiry, and data analysis.

Theoretical Framework

The theoretical framework of this study is critical theory.[28] Critical theory paid attention to power relations. In particular, it concerns the power relations among different team members.[29] Research conventionally to be controlled by researchers from academic institutions. Research informed by critical theory emphasizes the importance of involvement and contributions of researchers or collaborators from the grass root levels, such as community organizations. By involving people from the grassroots, the research aims to address the concerns of the people from the grassroots and has outcomes or outputs which can benefit these people.

The critical theory best fits what our team was doing: Our research team is based in 411 Seniors Centre, a grass-root community-based senior services in Vancouver. Community-based senior service providers and older adults were involved in different stages of the study. They expressed their interests in this topic, affecting them personally or at work. We co-created outputs for further collaborative actions (e.g., a report to consolidate our learnings and to be used for advocacy). We hope to raise society's attention to this topic and bring positive changes.

Methodology

Based on critical theory, we believe that we can understand our research topic the best by having dialogues with people and understanding how they understand this topic. We highly value their voices because community-based senior services usually are a sector that has weaker voices compared with other sectors such as healthcare.

Method of Inquiry

We conducted individual and group phone or virtual interviews with 28 stakeholders in community-based seniors services, including staff, volunteers, and policy developers. Unfortunately, due to COVID-19, we could not interview older adult clients in person, even though some service providers and volunteers interviewed were older adults. Many older adult clients did not have access to or were still in the process of learning technology at the time of the interviews. We also conducted participant observation in the remote conference, meetings, and service provision sessions related to older adult information and referral services. We took field notes too during interviews and observations.

Method of Data Analysis

We analyzed the data (fieldnotes) using thematic analysis.[30] The process was assisted by the qualitative analysis software Nvivo. We followed an inductive approach.[31] We coded for codes, grouped them into categories and built concepts based on them. We constantly compared the transcripts, codes, categories, and concepts.[32]

FINDINGS

This section will talk about the findings of the study. Several themes are found, including "diversity among older adults," "reasons for learning technology," and "ways of digital literacy learning."

Diversity among Older Adults

There are variations among older adults on the levels of digital literacy and confidence in using technology.

"Some have more knowledge on technology, and thus are very confident using it, especially those who used it at work before their retirement. Some have some knowledge of technology, such as checking emails. And some have limited or no knowledge of technology and feel very uncomfortable using technology." (Fieldnotes from service provider interview)

Reasons for Learning Technology

There are different reasons why older adults want to learn technology. One reason is to connect with their families and friends, especially those living out of town or unable to see each other due to social distancing requirements. *"Seniors can connect with people all over the world using technology."* (Fieldnotes from service provider interview) Another reason why older adults want to learn technology is to access information, services, and resources that have moved online. *"Olde adults can access a lot of information online, for example, applications to senior housing."* (Fieldnotes from volunteer interview)

Ways of Digital Literacy Learning

There are mainly two ways older adults learn technology, formally and informally. Learning technology formally means learning technology by going to classes. Learning technology informally means approaching a trusting person when they encounter a question or a problem related to technology and learning technology from this person. This trusting person includes older adults' family members, community-based senior service staff and volunteers, and their peers. These people are not a technician or a teacher related to technology.

"Some older adults feel scared with technology. However, they feel more comfortable learning with ***peers****. They are more likely to step out of their comfort zone with peers. The crucial point is whether service providers can find the right peers." (*Quote from service provider interview)

"Older adults go to the ***staff*** *they are close to for tech support. Staff Jim (pseudonym) provides one-on-one tech help, which is helpful but very time-consuming. Staff Amy (pseudonym) is also helping to deliver the tech equipment." (*Fieldnotes from service provider interview)

"Older adults want to join Anna (pseudonym of a staff)'s program but do not have zoom. So Anna does phone calls with older adults to help them set up Zoom step by step. Some older adults can ask ***family*** *to support with technology." (*Fieldnotes from service provider interview)

*"Older adults have different interests, such as music and dance. These are the tools to connect them. So Joey (pseudonym of staff) has built-in relationships with groups of immigrant older adults through these programs. They will come to her when they need her help." (*Fieldnotes from service provider interview)

According to service provider participants, most older adults prefer to start to learn informally than formally (Figure 1).

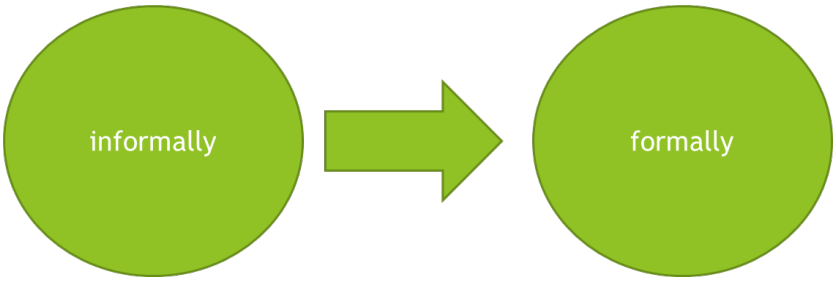

Figure 1. Older adults' digital literacy learning.

DISCUSSIONS: IMPLICATIONS ON PRACTICE/EDUCATION, POLICY, AND RESEARCH - WHAT DOES THIS STUDY MATTER IN THE REAL WORLD?

This section will discuss the implications of this study on practice/education, policy, and research.

Practice/Education Implications: Diversity among Older Adults

We found that older adults have diverse reasons and ways of learning digital literacy. This may be related to diversity among seniors in terms of, for instance, gender, culture, ethnicity, race, immigration status, socioeconomic status, and life circumstances. The understanding of diversity should be incorporated into the planning and design of future digital literacy programs for older adults.

For example, an older adult wants to learn technology because she wants to know how to do online shopping as she can no longer go out often due to her declining mobility. Providing her with education on online shopping best meets her needs. Another older adult wants to learn technology to connect with his family living in another province. Supporting him to learn how to send emails and do video calls will be most helpful in his situation. Teaching the second older adult about online shopping does not match what he wants to learn.

Policy Implications: Funding Allocation

Our study suggested that most older adults prefer to start informally with people they trust in digital literacy learning. This highlights the importance of relationship building. The trusting people who older adults reach out to learn technology are usually not paid for what they do. Even if they are staff of community-based senior services, helping older adults to learn technology is generally outside their scope of services. They are doing additional workloads to help older adults with technology. Yet, the government's funding for older adults' digital literacy learning usually goes to formal programs. Should the government consider paying these informal "teachers"? This is a social justice issue on redistribution (resources going to the right place) and recognition (recognizing older adults' preferences)[33]. However, these are unpaid roles, and there could be issues if we 'commodify' them. Whether these informal "teachers" should be paid is a complicated question. Future policy studies could explore this question further.

Research Implications: Voices of Older Adults

As suggested, a limitation of this study is that we were not able to speak with older adult clients due to COVID-19. Future research on this topic should include more voices of older adults, especially when the condition of COVID-19 has improved. Older adults' voices are crucial as they are the "users" of technology education.

Research Implications: Comparing Findings with Literature on Children and Young People

As suggested, most literature focuses on digital literacy learning in children and young people. Future research may consider comparing digital literacy learning of children and young people and older adults and see the similarities and differences. Researchers can then see what can be learned from the literature on digital literacy learning of children and young people and decide whether to apply or not apply the learning in the context of older adults.

CONCLUSION

More information, services, and resources have been moving online, especially since COVID-19. Yet, many older adults have challenges accessing technology. One barrier is a lack of digital literacy. There is limited literature on how older adults learn digital literacy. We explored this topic in British Columbia, Canada, by interviewing 28 stakeholders in community-based senior services, including staff, volunteers, and policy developers across the province. We found variations among older adults on digital literacy and confidence in using technology. Also, we found diverse reasons and ways for older adults to learn digital literacy. It found that older adults prefer to learn about technology informally by reaching a person they can trust. Often, this person is not technology related. The findings have implications for practice/education, policy, and research.

NOTE

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FRAMING ARCHITECTURAL DESIGN STUDIO PEDAGOGY IN 2020 AND BEYOND

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INTRODUCTION

In this epigraph, one may ask and wonder how the course of architecture is taught in the field of design studio? What are the outcomes expected in the outside world in this discourse? Are designers created or are they born? This article hopes to probe the educators and recipients on the current education being given and received, as well as the nature of educations and outcomes we are creating in the context of South Africa. In the same token we are not saying we do not welcome new thinking and ideas that challenge the status quo. The idea that is important is to understand the esoteric role of design and the mere essence of what our forefathers were trying to bring across. The ideas around beauty and understanding space. To educate is not to entrench but to open one's mind to new ideas of thinking and questioning within the same ideal parameters. This is done without lowering the standards or disregarding the past, but on the contrary its by having a firm grip on all components and nuances that bring about an intelligent point of view. I think it will also be improper in this article not to define the current socio-economic climate in South Africa that we are referring to, as much as we live in a global age we are faced with unique challenges as a country – and unique blessings with our climate, cultures, and diverse nation. Thus, it's important to really be able to understand our end users as designers. Our relevance hinges on creating spaces and environments habitable to our users. What are we then saying as designers and educators? Are we creating exclusive environments understood only by us? or we able to translate our depth of knowledge to people of all walks of life in our society.

PREMISE

This paper aims to engage with **professional disciplinary knowledge** at a broad level, given that knowledge is what informs or should inform curriculum and pedagogy. Architectural design education requires cognitive transformation. Piaget, however, underlines the interaction between the individual and his/her environment. Despite the little space for psychological services and educational issues in architectural education, the literature on the "problems of the first-year students" is vast. In many cases, those problems are discussed in relation to abstract thinking – which results in the same "employment mentality" post studies. Schools of architecture should explore cognitive abilities, differences, and similarities. What education in the studio context would promote agency within students to better acculturate in their context and the studio environment? What is absent from the literature of architectural education, however, is a specific focus in understanding the challenges faced by the first-generation graduate in the context of South African socio-economic challenges.

Epistemically understanding the students' voices and experiences, I would like to start by first defining first-generation graduates in the context of this paper.

First-Generation: graduates in post-apartheid South Africa in years 2000 – 2020

This is a key description in this paper where I talk about all students who are first in their family to study at tertiary institutions despite race or creed. It is a normative position to subscribe my work to only demographics of previously disintegrative blacks as that is most people in this category, but post-1994 in South Africa, a lot has changed and transformed but certain nuances involved in the academic space especially in architecture, remain arcane no matter race or creed.

There is surmountable literature indicating findings on undergraduate architectural pedagogy and hybrid and binary modes of teaching, post-2020. It is not what these modes entail, (in the context of a first-generation graduate who might still struggle with livelihood issues like food, shelter, data etc.) but rather it is the specific areas of teaching and reception of teaching that are not clear on how or to what extent the undergraduate degree in architecture prepares or propels a first-generation graduate to be a critical thinker and forge new methods and means to trade and or prepare for postgraduate studies whilst being a well-resourced and economically sound graduate in society.

On March 26, 2020, in South Africa, a state of emergency was declared, and a national lockdown was implemented. University teaching switched to online with immediate effect. The design studio teaching was thus also not exempted from this global crisis. In isolation, we carried on with teaching and learning. Technology became an integrated tool for teaching and arguably design. This pandemic was not unique to South Africa but a global pandemic, which meant a systematic approach to how one deals with the environment in studio teaching. The APS conference was also an excellent platform for showing possibilities of engagement post-Covid-19 in 2020.

Many students struggled with online studio learning due to various challenges varying from socio-economic conditions to family dynamics. The first-generation students were visibly enunciated as the nuances of studio learning were an arcane phenomenon especially in the first years of study. Dr Heather Worne from the University of Kentucky in her AMPS conference paper presentation, speaks in-depth on the student experiences and how these experiences affected their performance. Thus, post-Covid-19, we must forge a hybrid studio context that is sustainable as educators. We need to think of enhancing learning experiences for a student, especially in the South African context.

Entrepreneurial training for South African architects is limited, and as the foregoing revealed, generic training programs will most likely not provide training that can address the specific challenges associated with establishing and managing enduring and resilient architects[1]. This is probably the most important contribution of this study as the context of South Africa is unique in its socio-economic context. There are currently nine universities (including universities of technology) in South Africa that offer the subject of architecture in training.

In the stage of design education, the design studio exists in a range of contextual sets: it is an artist's studio where aesthetic and creative ideas are materialized; it is a lab where experiments in building technology are conducted; it is a philosophical scene where the theory of design is explored; and it is also a social workshop where the relevance of human and socio-cultural aspects of a design is addressed and applied, although distinct from each other, these different sets must exist concurrently to achieve a comprehensive studio experience and to fulfil the need for a broader and all-inclusive design studio education. Fernado (2007: 143) cited from Nico Botes "Demysifying black box"[2]. This then probes the question of how we create this synergy within a technologically advanced era that has limited face-to-face interactions as well as levelling the playing fields to those who have never come across this interaction – as identified as first-generation learners.

There is no formula[3] that the first-year intake at graduate schools proves that a candidate will be a success. Architecture as a trade requires an individual with resilience, who understands their fit and

can storm through design problem-solving scenarios. “As a teacher, I recognize that students from marginalized groups, enter classrooms within institutions where their voices have been neither heard nor welcomed.”[4] My viewpoint on the teaching curriculum is shaped to address this reality within the context that such students have no previous father, mother or any relative to go back to for support. They are essentially pioneers in their lineage, so they must constantly fight to be heard and to work and thrive within a different cultural fit. It is no wonder many young undergraduate graduates feel disgruntled at the end of their initial degree;[5] as a result of the fact that they cannot create solutions to their own design world. They are unable to adapt to the ever-changing socio-economic conditions to enable themselves to storm through a myriad of challenges presented. First generation graduates may have to storm and jump through a few more loops than others but the formula remains the same. Only individuals that can storm through that and find a space in the world to express their creativity in a particular context – thrive.[6]

This paper presents a case that a hybrid design studio pedagogy is more equipped to deal with our more evolving socio-economic climate in South Africa. This newly proposed hybrid teaching method further suggests that taking courses that the university already offered in other faculties (e.g., Sociology, philosophy etc.) as part of the studio curriculum strengthens the graduate’s ability to think differently about design problems and solutions. The student is also reintroduced to the apprentice mode of teaching whilst at university to strengthen further their ability to be resilient post the academic years. The paper aims to present research that is globally relevant to the discipline of architecture and is centered on the design of space. The architect’s core competencies regarding the spatial artefact have not significantly changed in the modern era. Architectural knowledge is produced and disseminated through its branches of practice, education, and research.[7]

While education acts as a threshold to the profession, there is, despite some chasms, a coterminous relationship between practice and the academy yet esoterically contextual to the South African learner, educator, and employer.

Figure 1. Vitruvius human figure drawn by Leornado da Vinci B. Human Proportion system

This figure is an image of Vitruvius that is esoteric to the scholars of Architecture. Vitruvius was a Roman architect and engineer during the 1st century BC, known for his multi-volume work entitled De architectura. He originated the idea that all buildings should have three attributes: firmitas, utilitas, and venustas. These principles were later widely adopted in roman architecture. To a mere average

human being, the image is banal and has no significant meaning, depending on their exposure. What are we then saying as designers? Are we creating exclusive environments understood only by us? Or are we able to translate our depth of knowledge to mere standard people? One client of mine asked that 20 years into South African democracy, how do I feel about being a practising Architect who still has not come up with the meaning of the word Architecture in any other vernacular language? I was then probed to think of this trade within its tapestry – known history that has not been said. Thus, Mdwebimakhizakhiwo™ is the word that was birthed that well describes in Nguni spatial design, exploration and buildings intertwined. We then saw it fit to start singing this song of design in Zulu as well for the harmony's creation of the current status quo to be challenged. 2020 did not only challenge the status quo on the live vibrant studio culture but with the pandemic, it "FORCED" change. It did not matter whether you are in Westminster in Europe or Emhlathuze in KwaZulu Natal, South Africa. In order to engage with design away from your peers yet, come up with accurate design solutions and engage with the reality of being taught live.

This is the new "normal"[8] as has been coined by many, is questioned. Will we ever go back to the old normal, where time and resources were invested in a studio culture? The medical fraternity is leading the conversation on how spaces should be used. We are encouraged to social distance and allow a "sparse" use of space and not crowd any spaces. Teaching design has taken a virtual platform and engagement amongst peers and is fostered by individuals who engage by logging in and it is no longer a spontaneous activity in other sectors. There are benefits in teaching in this mode as communication must be precise and clear and a lot faster as there are visible time restrictions in the virtual world. This certainly does not mean this is how forever will be but there are modes of synergies that must be thought of in a sustainable future. Educators in Architecture are thus faced with a task of a revolutionary shift in their design teaching thinking. How to adapt to the agile conditions but maintain the same rigor and cross-pollination of ideas that the live studio offers. This creates an opportunity for lateral thinking that the course aims to foster, albeit not a design problem, but instead has the same intricate ideas and levels of attention that a design problem may have.

In a recent discussion with honors students who had just completed their undergraduate degree in Architecture, it has become imminent that the students themselves have now been exposed to the realities that face them and are demanding an education that is in tune with the realities of resources, energy, and economic stability. The schools of architecture will have to be steered in transforming and creating pedagogy relevant to the agile world. This then requires educators who are in tune with challenges on the ground and are thus able to translate the working and thinking into studio projects whilst maintaining the architectural education integrity of the simulated office that echoes but does not mirror the world outside of the university. The other important aspect is also understanding the realities of first-generation graduates. One of the students framed it in his own words as saying that. "Reflecting back on my BAS undergraduate experience and speaking to everyone that has also graduated, I realized how there is always a huge disparity between ***the haves and the have-nots*** in our school. Being part of the *have-nots* meant you are from a marginalized background, probably a first-generation university student in your family, and minimum to no architectural career field guidance or reference in your family tree. I do believe that this has always hindered us from producing quality work and therefore we are always playing catch up from the first day you step into the school of architecture. Indeed, there are some exceptional students who have managed to cope and excel in the school from marginalized backgrounds but the focus here is about uplifting those who cannot uplift themselves. The ripple effect is those who struggle at the schools of architecture and eventually graduate will also struggle to find a work placement" This can be circumvented by creating a more rigorous hybrid mode of teaching that focuses on the apprentice model as discussed. Ideally, early in the undergraduate years. This will also have to be legislated to architects in practice, so they benefit the students, as some architects find it cumbersome and more of a hassle. In the South African

context, it is easier, one student commented, as there is the scorecard for transformation that is required for procuring work and as one student indicates they have benefited from the form by being one to improve that scorecard.

The ideal is that schools of architecture will produce thinkers and innovative architects with basic tools to engage with the world despite their background, color, or creed. The students, or rather graduates should be able to bring about vital design solutions in their world or context. They need to display perseverance and ingenuity that will enable them to work with any circumstances that they are dealt with in life or any country in which they reside. They should be able to do this whilst upholding high standards of quality that the architectural skill requires. Experience will then propel and teach new lessons that will be beyond the classroom environment.

CONCLUSION

It is proven to be exciting to teach at these times and one wonders at the graduate's ability to marry the tactile quality of what is being taught and the reality they will face. There is no longer any procrastination allowed, 2020[9] has forced change and if one resists, they are left alone in the cold behind. It has been encouraging speaking with various educators across South African universities who offer first-year teaching. There has been a high level of resilience amongst educators and students alike. People are embracing change and soldiering on. One can only wonder about the future but at least as South Africans, we are certain that it will find us prepared!

I strongly believe that Architecture is an apprentice type of teaching[10] (reconnecting learning with practice); it is a skill that gets acquired over time. We are also free to call it apprentice or mentorship in the current world where positions of hierarchy re respected. The talent of an individual scholar cannot be disputed but integrity in design is of paramount importance – developing strong leaders and financial managers who can run strong practices in this economy is something that is learned and not taught. My intentions are to see how that learning as a process can be entrenched in the Architecture school during the years of learning, and how we develop strong social values. We cannot save the world, but Architects have a significant role to play in designing a world, not only in buildings but in transforming the public's mindsets in spaces they walk in – environments created that are conducive to a thriving global environment. This is done without negating reality and only dreaming of utopian ideas, but as architects, we can bring hope weave a tapestry of joy despite resources that are scarce and ensure that the world, we live in is there to be enjoyed by more generations to come post the pandemic of 2020! Richard Meier says "Any work of architecture that has with it some discussion, some polemic, I think is good. It shows that people are interested, people are involved" We can never as architects please all and there will always be aspects not covered but to certainly develop through informed pedagogy in schools of architecture, strong architects sensitive to the needs of society and context in which they reside in would have shown great strides in contributing to our utopian ideal world.

NOTES

[1] Christo Vosloo, "Entrepreneurial Education and Training for Architects." *Athens Journal on Architecture* 2, no. 1 (2016):34.
[2] Nico Botes, "Towards Demystifying the" Black Box": Body as Site." *South African Journal of Art History* 27, no. 2 (2012): 233.
[3] Botes: 78.
[4] Bell Hooks, *Teaching to Transgress.* (New York: Routledge, 2014), 102.
[5] Van der Merwe, D & De Beer, M, "Challenges of student selection: Predicting academic Performance." *South African Journal of Higher Education* 20 no.4 (2006):547-562.
[6] Anne-Marie O'Neill, "Individualism, enterprise culture and curriculum policy*", Education policy directions in Aotearoa New Zealand Palmerston North*, ed. J. Codd & K. Sullivan (New Zealand: Dunmore Press, 2005), 82
[7] Julia W Robinson and Andrzej Piotrowski. *The Discipline of Architecture.* (University of Minnesota Press, 2001), 61.
[8] Siphamandla Zondi, "Covid-19 and the Return of the State in Africa", *Politikon: South African Journal of Political Studies* 48, no. 2 (2021): 205
[9] Janet Wilde Astington, and Janette Pelletier, "The language of mind: Its role in teaching and learning", in *The handbook of education and human development: New models of learning, teaching, and schooling*, ed. D. R. Olson & N. Torrance (Maiden, MA: Blackwell Publishing, 1996), 593.
[10] Harber Rodney. "Paradigm Lost.", *Architecture South Africa-Journal of the South African Institute of Architects* (2008): 044

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ENGINEERING MANAGEMENT IN AUSTRALIA

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INTRODUCTION

An engineer is mentioned to become the management regardless of whether and when.[1] While being technically qualified for engineering positions, engineers lack critical managerial skills.[2] Due to the nature of engineering, managing engineering is mentioned to be different from managing most other activities.[3]

Being market-driven, historically, the Engineering Management (EM) discipline was designed to meet the demand.[4] It is specially designed to bridge the gap between engineering and management.[5] EM degree is mentioned to have a long history back to the 1910s in the US with the courses in business and management aspects of engineering.[6] Until the mid-1940s, EM officially became a formal degree, and EM only became well-known when a large number of universities started to develop their programs from 1980s'.[7] EM educational and research programs have increased significantly in the last few decades, and this has provided further insights for readers from both educational and industrial perspectives.[8]

In Australia, the managerial role of engineers and EM educational programs have been recognized since 1986 [9] and engineering manager has been classified as an occupation in Australian Standard Classification of Occupations (ASCO) since then. Australia is also mentioned to be the second country distributing engineering and technology management programs after the US[10]. However, to the authors' knowledge, Australia is still in its infancy of research and review of this field. Further study on this discipline will bring an insight of EM practices to help academia and industries to develop strategic decisions.

Given this limitation, this research aims at (1) investigating the importance of this profession to professional engineers on their engineering career path through examining the correspondence between EA competency standards and EM disciplines; and (2) providing an insight for educational institutions in the development of EM programs through analysing current state and evolution of EM programs.

This paper is organized into three sections. The next one is the literature review on the significance of EM profession and the current state of EM educational programs. It is then followed by EM current practices in Australia. The final section presents the contribution and implication for further research.

LITERATURE REVIEW

EM profession

According to Lannes (2001), a typical engineering career path includes three phases, namely engineering – engineering management - management of technology.[11] EM phase will usually be after the first five years working in technical field and will last from five to twenty-five years.[12] Practically, practitioners address that EM is always involved in engineering professional practices.[13]

Academic discipline EM is well-established and recognized by Accreditation Board for Engineering and Technology (ABET) [14] and EM programs are provided at all levels.[15] Management skills, besides strong technical skills, have been recognized by the American Society for Engineering Management (ASEM). This organization provides a standard framework to define the characteristics of a successful EM programs for ABET and also certifies EM post-graduate programs.[16] Recognizing the significance of EM, ASEM has officially published a guidebook - A Guide to the Engineering Management Body of Knowledge (EMBoK) - as a foundational reference for this discipline. This guideline reflects current research and practice across all EM domains and is also used for professional development programs. EM Body of Knowledge have been identified with ten domains:[17]

- Domain 1. Leadership and Organizational Management;
- Domain 2. Strategic Planning and Management;
- Domain 3. Financial Resource Management;
- Domain 4. Project Management;
- Domain 5. Quality Management System;
- Domain 6. Operations and Supply Chain Management;
- Domain 7. Management of Technology, Research, and Development;
- Domain 8. Systems Engineering;
- Domain 9. Legal Issues in Engineering Management;
- Domain 10. Professional Codes of Conduct and Ethics.

EM educational programs

Although EM is expected to be used more extensively as an engineer's career progress; it is implicated that starting engineers should prepare these areas as early as possible.[18] As such, ABET has put more focus on developing the understanding of the discipline and its importance in undergraduate programs.[19] There has been an increase in the number of EM programs offering over time.[20] This is the result from the attraction to engineers from all disciplines, the ability to build university goodwill and bring financial returns.[21]

However, scholars argue that EM programs should be at graduate levels rather than undergraduate since graduate students should prepare for the transition to the management phases at the graduate level.[22] As such, among three levels, EM graduate programs receive higher demands and interest to employers and engineering professionals;[23] whereas EM at PhD level has witnessed a stability in the number of programs offered.[24]

Despite the role of accreditation in enhancing the reputation as well as credibility of EM profession and program,[25] literature shows a low rate of accredited EM programs.[26] There has been a debate about the accreditation for EM programs among scholars in the literature. Since the benefits of ABET-accredited academic programs for both educational institutions and future employment opportunities for graduates cannot be denied; it is mentioned that there should be a strive to accredit EM programs at diverse institutions.[27] However, more non-accredited programs are found to not pursue accreditation. Besides the fact of the significant investment in resources required for accreditation, the given reason is the focus on the areas and requirements being articulated by industry.[28]

Regarding master programs, while ABET accreditation is well-known for undergraduate programs, very few programs are ABET-accredited directly.[29] The only ABET-accredited program is at the Air Force Institute of Technology which was accredited in 2004.[30] Master programs tend to seek recognition from ASEM or ASEM-certified programs.[31] This certification is a standard of excellence

to recognize master programs meeting a reasonable set of minimums.[32] However, ASEM-certified master's programs still remain very low with only 5.4% in 2015.[33]

EM IN AUSTRALIA

In Australia, EM concept was first found in "1986 Engineering Conference: Engineers as Managers", in which authors discussed problems that engineers face in changing over to a role in management.[34] In the same year, engineering manager was classified as an occupation in the first edition of ASCO. Since 2006, engineering manager has been recognized in both Australian and New Zealand Standard Classification of Occupations. The role of management has been confirmed to play a vital role in practice for professional engineers [35] and to be a requirement for all engineering activities.[36] Regarding education, the Australian Institution of Engineers has emphasize the importance of EM by mandating this in its undergraduate engineering programs.[37]

EM and professional engineering competency standards

According to Engineers Australia (EA), the engineering profession body and the accreditation authority for tertiary institutions in Australia, there are roughly 186,000 engineers are working in this country [38] and each year has more than 10,000 domestic students and 10,000 overseas students completing courses in engineering and related technologies.[39] These professional engineering workforce are required to meet certain competencies to be certified as Professional Engineers (PE), Engineering Technologists (ET), or Engineering Associate (EA). In this article, the focus is the PE group.

EA provides a framework for Stage 1 Competency Standards for PEs, which include the three competencies (Knowledge and Skill Base, Engineering Application Ability, and Professional and Personal Attributes) with total sixteen mandatory elements. For each element of competency, there are indicators of attainment to provide an insight of the breadth and depth of ability expected. To examine the importance of EM on professional engineering career, a comparison is conducted using EA competency standards for Professional Engineers (stage 1) with EMBoK. To be more specific, all indicators of attainment for each element of competency are reviewed to identify all required ability, skill, and knowledge. These requirements are then mapped with ten EM domains. The following table illustrates the correlation between EA competency standard and EM domains.

Stage 1 competency standard for Professional Engineers		EM Body of Knowledge (EMBoK, 5th ed)
1. Knowledge and skill base	1.4. Discernment of knowledge development and research directions within the engineering discipline.	Domain 7
	1.5. Knowledge of engineering design practice and contextual factors impacting the engineering discipline.	Domain 6 and 8
	1.6. Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline.	Domain 4, 9 and 10
2. Engineering application ability	2.1. Application of established engineering methods to complex engineering problem solving.	Domain 7, 8 and 10
	2.2. Fluent application of engineering techniques, tools and resources.	Domain 5 and 8
	2.3. Application of systematic engineering synthesis and design processes.	Domain 2, 9 and 10
	2.4. Application of systematic approaches to the conduct and management of engineering projects.	Domain 2, 3 and 4
Professional and personal attribute	3.1. Ethical conduct and professional accountability.	Domain 10
	3.3. Creative, innovative and pro-active demeanour.	Domain 7
	3.6 Effective team membership and team leadership.	Domain 1

Table 1. Mapping EA competency standards with EMBoK

The table has clearly shown the strong link between EA competencies and EM domains. Professional engineers require the knowledge and skills from the EM discipline to perform EA competency. They must demonstrate EM skills and competencies in engineering projects, in solutions to complex problems; or to manage teams or may move into senior management roles. Interestingly, ten EM domains have been covered in all EA competency standards.

EM educational programs

Australia is mentioned to be the second country distributing engineering and technology management programs after the US.[40] However, to authors' knowledge, there has been no research or report on EM educational programs found.

To examine the current practices of EM programs in Australia, CRICOS (**Commonwealth Register of Institutions and Courses for Overseas Students), an** official Australian Government organization; and EA accreditation program list (Last updated 15 April 2021) are used to collect data of EM Programs in Australia.

Findings

Keyword "Engineering Management" or "Management of Engineering", "Management for Engineers", "Management Engineering", and "Engineering and Management" are used to search for programs using the term "engineering management" exclusively for the program name. Furthermore, "Professional Engineering" programs are also searched and examined in detail to check for specialization or major in EM. The result is described in Table 2. Furthermore, engineering programs with "Management" in the titles are also considered for EM programs based on the ABET program criteria. [41] It can be technical disciplines with management options. List are presented in Table 3.

Level	Program name	Number of programs
Bachelor	-	0
Master	Master of EM	13
	Master of EM – MBA	2
	Master of Engineering - Master of EM	1
PhD	-	0

Table 2. EM programs in Australia

Level	Program name	Number of programs
Bachelor	-	0
Master	Master of Engineering Project Management/ Environmental Engineering Management	5
	Master of Engineering (Management specialization) Ex: Master of Maritime Engineering (Technology Management)	5
	Master of Engineering (Civil) and Master of Engineering Project Management/Construction Management	4
PhD	-	0

Table 3. Engineering programs with "Management" in the name

Contrast to the global trend, while EM discipline is firmly established as a recognized undergraduate degree program by ABET, [42] Australia witnesses the opposite with no EM program found at the bachelor and PhD level. EM programs are dominantly in graduate programs with a variety in curriculum design, including "stand-alone" EM program, "dual-program" between EM with master of engineering or MBA; or engineering disciplines with management options.

EM master programs are still mentioned to have significant differences and to lack agreement among universities on program content.[43] Instead, these programs are developed based on selected courses to meet the demand. [44] Comparing among "stand-alone" EM programs in Australia, the curriculum design is diverse enough to support different demands in society. The focus on management or mathematical/ engineering concepts can be easily seen in electives. Some provide a wide range of electives in the engineering field (such as University of Wollongong, University of Technology, Sydney), while others offer management-oriented elective courses (such as La Trobe University, Macquarie University).

Instead of "stand-alone" EM programs at undergraduate level, it is common for institutions to offer the combined, double, or dual degrees in field of Engineering and Management such as Bachelor of Engineering and Bachelor of Commerce/ Business. EM education is mentioned to be scattered in many different programs. It can be the mutual efforts between colleges with the combination of

Engineering and Management programs.[45] And this mode has been introduced in Australia from the early 1990s.[46]

Accreditation

Although no EM programs is found at undergraduate level, in the EA accreditation list, there were programs with "engineering management" exclusively for the program name before 2009. These programs were the "stand-alone" program or combined program. Table 4 shows the list of these programs. Similar findings for engineering programs with "Management" in the name are found at undergraduate level. These are no longer offered. These programs are listed in Table 5. This may raise a need for further understanding of undergraduate educational evolution in Australia. Why these EM programs are no longer offered.

Name	Year of accreditation
Bachelor of Technology - Engineering and Management	1996 – 2002
Bachelor of Engineering - Industrial Engineering and Engineering Management	1999-2008
Bachelor of Engineering - Manufacturing and Engineering Management	1985 – 2009

Table 4. Accredited EM programs before 2009 (no longer offered)

Program name	**Year of accreditation**	**Number of programs**
Bachelor of Engineering (Engineering Management specialization) Ex: Chemical Engineering Management	• 2005-2007 • 1987-1997	8
Bachelor of Engineering (Engineering and Management specialization) Ex: Civil and Environmental Management	• 2010-2014 • 2000-2015 • 2002-2014 • 1996-2002 • 1999-2002 • 2002-2009	12

Table 5. Accredited Engineering programs with "Management" in the name (no longer offered)

Regarding the graduate programs, EA does not accredit "stand-alone" master programs which only offer engineering practice and management. Rather, engineering master programs with majors in management are developed for the engineering professions (Table 6). These courses are accredited by EA which allows graduates to work as professional engineers in countries.

Program name	**Number of programs**
Master of Professional Engineering (Engineering specialization and Management) Ex: Master of Engineering (Electrical and Management)	2
Master of Engineering (Engineering specialization with Business) Ex: Master of Engineering (Electrical with Management)	6

Table 6. Accredited master program with management (currently offered)

In the latest report of Engineers for the Future by the Australian Council of Engineering Deans, the continuing professional education is to focus on professional training for engineers and engineering managers; and developing management and leadership skills for engineering work.[47] Research on EA accredited programs has shown that most of the accredited engineering programs are combined with bachelor of Business/ Management. This finding reveals an insight of EM undergraduate program in Australia. EM discipline is provided through combined or dual programs, rather than EM exclusive program.

While there is a continuing interest of universities in offering EM master programs in Australia, there has been no research on how to manage the quality of these programs. A certification of EM graduate programs will add value in advertising in the company of programs. The information presented here may be useful to institutions in developing their strategy for certifications.

CONTRIBUTION, IMPLICATION, LIMITATION AND FUTURE RESEARCH

Contribution and implication

This paper is the first paper contributing to an insight of EM profession in Australia. This is to help professional engineers improve understanding of the significance of EM on their engineering career path, and to provide an insight for the development of EM programs.

Firstly, the role of EM for professional engineers has been confirmed in the literature by academics and empirical research has been conducted in the US and New Zealand. Australia has mentioned the need of EM to society since 1980s, research on EM role on an engineering career path has not previously been achieved in Australia. This paper confirms this correlation by showing the strong link between EA competency standards and EM domains. The results imply the necessity of EM knowledge and skills to meet EA competency standards for professional engineers. Especially, all EM domains are covered in professional practices.

Secondly, although Australia is the second-ranked country offering EM programs to meet society needs from the beginning days, no research has been conducted on educational programs since then. A review of the current state and comparison with the past has revealed interesting points in EM evolution in Australia. While EM is a well-defined discipline with accredited undergraduate programs globally; in Australia, the contrasts are found with “stand-alone” EM undergraduate programs along with engineering specialization programs with an engineering management focus are no longer offered. Instead, educational programs are designed to prepare engineering students with managerial skills from the early stage in their career pathway through the concept of dual degrees between engineering and management. On the other hand, EM postgraduate program is a well-defined discipline with a wide range of electives in scope and focus among educational institutions. These findings yield an insight of EM programs to help academies to develop strategic decisions. Why there no EM programs at the undergraduate level.

Thirdly, accreditation practices for EM programs have also been offered in this paper. Contrast to the US, there is no accredited EM program in Australia at all levels. Instead, professional engineer accreditation programs are established combined with Business programs to fill the gap between engineering and management. Since EA does not accredit “stand-alone” EM master programs, certified-programs is suggested for the recognition to stakeholders.

Limitations and future research

There are several limitations in this work. Firstly, there have been no data for the commencement year of EM programs along with the number of graduate students found. As such, the need and trend of EM programs over time have not been examined yet. Secondly, EM programs are taken based on titles. The content and structure of engineering programs have not been investigated further. Thirdly,

there has been no EM association or society in Australia, as such, all comparisons or standards are based on the US system.

To further advance the understanding of EM profession in Australia, the following investigations would provide an insight in developing strategies for the academic side of the society.

-Empirical research to examine on the importance of EM to professional engineers or engineering career path;

-Comprehensive analysis on trends in EM education;

-Current practices of EM graduate programs and the roadmap to certified programs.

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A DATA-DRIVEN APPROACH TO IDENTIFY INTERIOR DESIGN SETTINGS THAT ENABLES GROUP COLLABORATION BASED ON NON-INVASIVE SENSORS

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INTRODUCTION

As technology has evolved, so has the purpose of visiting and spending time in libraries.[1] Aabø & Audunson [2] reports that libraries have transformed from being mainly a provider of books to the public, to becoming a space provider for multiple different purposes and activities, and most library users (more than 55%) do not borrow or use library materials such as books and films. Montgomery[3] reports that one of the main functions that define library space for students is the role as a facilitator to ”foster self-directed learning”. Oblinger[4] describes the library as a place for social learning, where spaces are provided to stimulate students to learn from each other. In these environments, open conversation and collaborative learning are encouraged in an environment outside the classroom, also called informal learning spaces.[5] Students find it attractive to perform their out of class work at the library, both individually and in groups. The “peer effect” among students, also known as social interaction or collaboration has been reported to correlate with students’ academic achievement.[6]

Our cognitive functioning is strongly influenced by our surrounding interior design.[7] Vago & Zeidan[8] describe how the brain operates at different states with varying cognitive processes related to external inputs such as visual, auditory, and somatic affect and change our mental state. For instance, window view and especially views of nature improve our ability to concentrate,[9] reduces stress level,[10] and increases cognitive tranquility.[11] The field of neuroscience documents the obvious correlation between our surroundings and our cognitive functioning. The physical surroundings play a significant role in the users' experience when performing knowledge work. Up to 60% can be attributed to the surroundings, while the remaining can be related to social circumstances.[12] According to Augustin,[13] environmental determinism is the belief that you can change people’s behavior by modifying the places in which they behave, without changing anything else in their lives, and reports how interior design choices can stimulate people toward specific behavior, such as more intellectual, collaborative or social.

In the West, most employees are knowledge workers.[14] Achieving effective collaboration in groups is decisive as the outcome is typically more valuable than the individual outcome of the group members .[15] International design firms such as Gensler and Steelcase have Socializing and Collaborative spaces as essential design principles for workplaces.[16] Therefore, understanding which physical interior design space attributes creates the best framework for individuals' ability to socialize and collaborate in group work is of great value. Studies have shown remarkable gains in understanding the factors influencing students' preferences and experience in indoor workplaces associated with the physical

surroundings. A study conducted on workspaces for the public within a library environment, involving 268 participants, identified specific space attributes that were decisive for users' choice of seating and overall satisfaction during their stay.[17] The five top-ranked space attributes were amount of space, noise level, crowdedness, visual comfort, and window view. Space attributes are related, and multiple studies report their impact on group collaboration and interaction. For example, a table's size, form, and position influence the mentioned space attributes, such as the amount of space, occupancy level, view, etc. Furthermore, Allen & Henn [18] reports that people who sit closer together interact more than people who sit farther from each other, and having eye contact also enables more collaboration among peers. Another study highlights the importance of the workspace location as an enabler of collaboration. Augustin [19] suggests group spaces should be placed along circulating routes and not at their ends. Isolated at the end, it is more likely they are used for individual work.

Former studies of human behavior in work and learning spaces are primary based on qualitative methods such as surveys, observations, photos, mapping diaries, focus groups, and interviews. [20] Quantitative studies are also applied with data primary being collected through wearable devices such as sociometers .[21] Despite obtaining qualified intimate details, the scope of data is often limited due to two circumstances, 1: the need for manual resources, and 2: user consent and/or physically involving subjects as part of the measurement. Furthermore, the latter introduces a bias effect, the so-called Hawthorne effect,[22] in which users who are aware of being monitored consciously change their behavior.

DESIGN HYPOTHESIS

There is a positive correlation between the macro head movement of group members and their level of internal interaction (peer effect). In addition, the level of interaction may be affected by the surrounding physical environment.

This study introduces a new conceptual methodology on how to measure the “peer effect” level among an academic group of students working together on out of class assignments. A statistical significance level is associated with the surrounding interior to identify which space attributes enables social interaction and collaboration in groups.

Compared to previous studies, two issues are addressed; 1: avoiding the Hawthorne effect. Since the sensor type is 3D depth cameras, the data format does not become person-sensitive, eliminating the necessity for consent or inform subjects about the measurements. 2: Since no manual resources are necessary to perform the measurement, the data volume becomes significantly more extensive, strengthening the statistical evidence.

CASE STUDY

Field-testing was conducted within a public library, in Denmark, hosting between 3-4000 visitors daily. The library has become a focal point for many different population groups. With a North-East pointing view of the city harbor, an area of about 1,500 square feet has been selected to carry out the field tests (see Figure 1). Academic students from the local University often use the area to complete their out of class assignments. Being a corner area, the space is not trafficked with transit visitors. Facing North-East, glare is not a problem, and the large windows from floor to ceiling (5.75 m, 19 feet) covering two full facades, ensure continuous lighting of the entire area. Tests were conducted over three weeks with four days of data collection each week, Monday – Thursday from 8 AM – 6 PM.

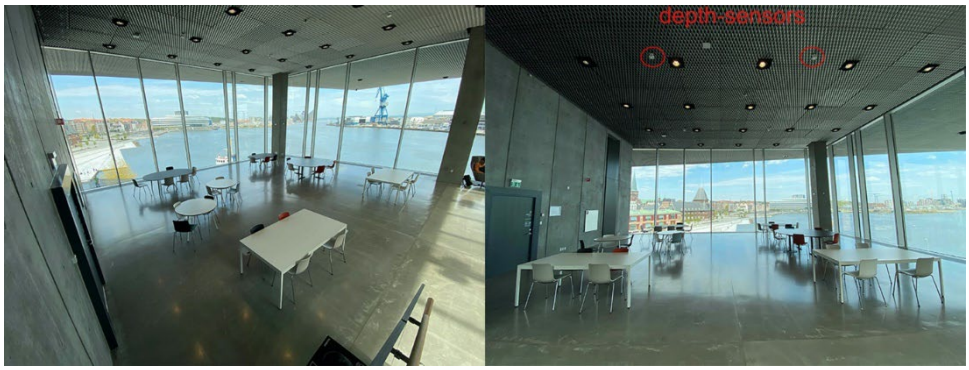

Figure 1. Optical images of the North-East facing corner area (right-hand image highlight depth-sensors with red circles)

A set of desk-related working zones with varying surroundings were required to identify how the different space attributes affect group collaboration. The corner area (Figure 2) was split into six zones and equipped with four different types of table furniture: oval (2 pc), rectangular (2 pc), large round (1 pc), and small round (2 pc). During the 12 days of testing, the furniture was moved to avoid bias effects. In total, there was a capacity of 60 workspaces for the visitors, who were mainly academic students between the ages of 20-30.

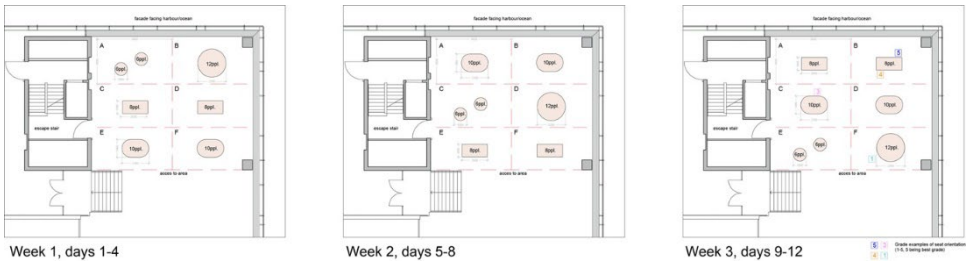

Figure 2. Floor map illustrating the six locations A-F and table types. Number centered in each table represents the table seating capacity.

SENSOR TYPE

As sensors become smaller and smaller and less obtrusive, quantitatively analyzing human behavior based on electronically generated data has become more popular.[23] The development of smaller sensors has made it possible to complement or replace manual resource-intensive studies. For this purpose, the test space was monitored by four discrete long-distance XOVIS PC2R-L depth cameras installed below the ceiling leaving 5,65 meters between lens and floor. Figure 1 shows the positioning of two sensors mounted nearest to the hall.

Depth cameras do not use optical images but solely measures distances to objects within the field-of-view. Depth data cannot be associated with an individual person, why the method falls in line with the regulations and restrictions regarding measures concerning person-sensitive data.[24] Depth-sensors outputs coherent x and y coordinates for each identified person within the field-of-view. Due to the high spatial (in centimeters) and temporal (4 samples per second) resolution, it is possible to label each person with a unique id from arrival to departure. Figure 3 is a fictitious animated example of how four different users are behaving while seated. Each dot represents a sensor measured XY-coordinate, and the four larger black dots are the calculated mean value for each person. Dots colored red, green, and blue form a group, while the yellow dots represent a single person. Projecting the dots into the X- and Y-axis shows the difference in spread (variance) between group members and singles.

Such observations determines whether subjects are working as singles or in groups and the group interaction/collaboration level (peer effect).

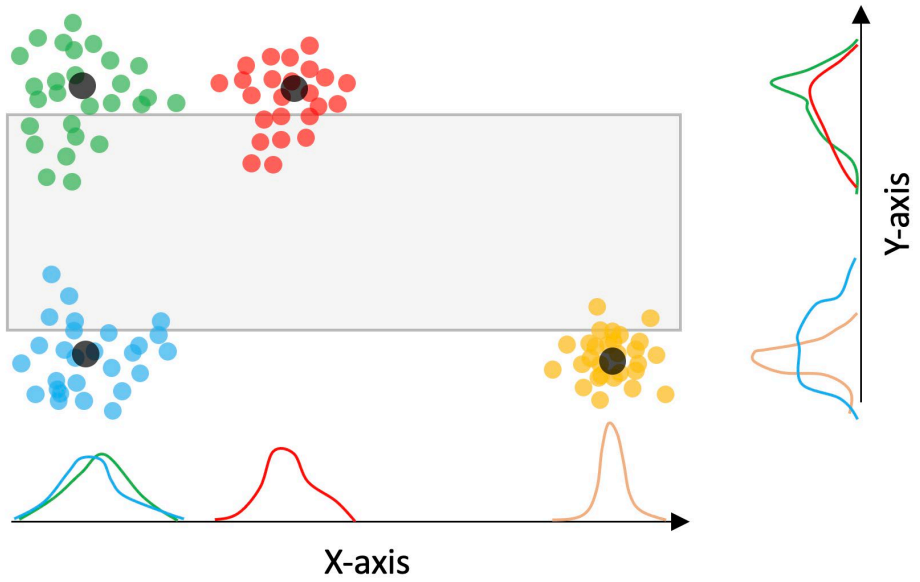

Figure 3. Animated example illustrating how data is generated when subjects are seated at table, either alone (yellow dots) or in groups (red, green and blue dots).

The study protocol is two-fold: Initially, a validation study to determine whether the processed sensor data correlates with the level of group peer effect. Subsequently, a 12-day field study is performed on a larger audience to obtain extensive volume data and derive statistically significant findings linking space attributes with group peer effect. During 12 days of measurements, 638 users visited the workspace with an average stay of 205 minutes resulting in approx. 30 million samples of XY coordinates. Of these, 470 users were involved in groups of 2, 3, or 4. Groups of 5 members or larger were excluded as the amount was negligible. Parallel to the test study, blurred videos were recorded for validation purposes and deleted afterwards. The validation ensured that the sensor data guaranteed to identify each individual as either a single or a group members (also to a specific group), together with location, table type, seat number, and time of stay.

Study 1: validation study

The validation study is performed in two steps. Step A: the week before to the 12-day field study (Study 2) an observational study was conducted in the same environment. Two instructed persons were observing a specific group of either 2, 3, or 4 members. For each 5-minute interval, the observers scored the internal group peer effect level between 1 to 5, 5 being the highest level. Subsequently, the average value was used. All members were aware of the observation, and the observers were less than two meters distant from the group. In total, 12 groups (44 individuals) were monitored for an average of 92 minutes. The result is a correlation of the subjectively human quantified level of group peer effect with the sensor measured variance of XY coordinates. A sufficiently positive correlation value demonstrates that the sensor measured spread of XY is an indicator of peer effect.

Step B: During the 12-days of field study, 142 individual group members responded to a questionnaire scoring their total group peer effect level during their stay with 1 to 5, 5 corresponds to the highest level of peer effect. Each rating reflects upon their entire time of stay. Knowing their table type, location, seat number, and time of stay, it is possible to correlate the individual group members

grading with the sensor data for the specific group. This provides an additional opportunity to examine and validate whether the sensors are converging or diverging with the users' individual subjective experience of peer effect.
In both validation studies, an algorithm can be deducted based on the two sets of data by converting XY-coordinates to peer effect levels.

Study 2: field study

As presented in Figure 2.1.5-2 the floor map offers different workspaces in regard to the space attributes location and table type. Study 2 covers a more extensive study using the algorithm (converting XY-coordinates to peer effect levels) of 12-days to quantify the correlation between group peer effect with the interior space attributes, such as work location and table type. Location offers different environmental conditions.
-Locations A and B are at the corner, least people traffic and surroundings are mainly window view and workspaces.
-Locations C and D are in the middle, average people traffic and surroundings are mainly workspaces.
-Locations E and F are at the entry, high trafficked and surroundings are mainly hallway and workspaces.
The size and shape of the four different table types also offer a variety of conditions.

RESULTS

Initially, it was examined whether the XY spread for individual and group members was different, as the fictitious example in Figure 2.1.5-3 illustrates. Movements associated with arrival and departure to the seat are omitted. Comparing the XY spread of 154 singles with 484 group members results in a p-value less than 0.01, favoring singles having less spread (or seated more still).

Study 1: Validation study

Validation study A involves 44 subjects and 225 responses (prior to the 12-days field study). Figure 4 shows a scatter plot that compares data from the sensor measured spread of XY coordinates (x-axis) with the human observed grading of peer effect (y-axis). An analysis results in correlation coefficient of $r = 0.70$, and a Probable Error of the correlation coefficient r, $P.E.r. = 0.0520$. The ratio between r and P.E.r. (13.4) and a strong p-value ($p \leq 0.01$) indicates a statistically significant dependency (Eells, 1929).

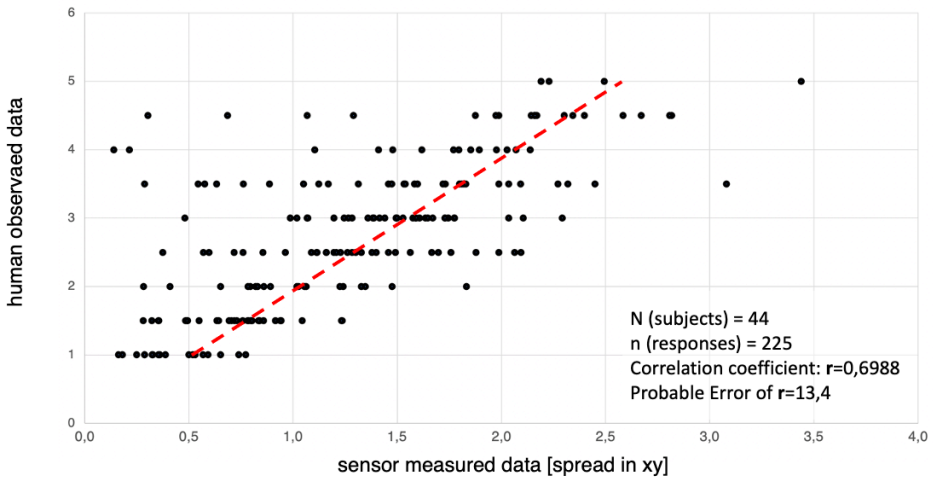

Figure 4. Scatter plot of the sensor measured XY spread (x-axis) and human observed grades (y-axis) together with correlation results.

Validation study B involves 142 individual gradings from group members (during the 12-days of field study). An analysis of the individual gradings with the sensor measured spread of XY coordinates of the respective groups results in a correlation coefficient of r = 0.55. Both the P.E.r. and p-value indicates statistically significant dependency between sensor data and subjective human ratings, see Table 1.

Data analyzied	N (subjects)	n (responses)	Correlation (r)	P.E.r.	Ratio r/P.E.r.	P-values
Study 1A: Comparing sensor data with human observational ratings	44	225	0,6988	0,0520	13,4307	≤ 0.01
Study 1B: Comparing sensor data with group member ratings	142	142	0,5500	0,0395	13,9309	≤ 0.01

Table 1. Validation Study 1A & 1B correlation results

Study 2: Field Study

Initially, a review was conducted to understand how groups have been distributed between the respective locations and table types. An approximate even distribution of participants (age, gender, table type, and location) reduces biases. This allows a more accurate correlation between location and table type with group peer effect. An odd distribution would complicate the comparison. A non-uniform distribution of group sizes on different table types was identified, a natural consequence of the different table seating capacity. Therefore, there is no statistical difference favoring any table type if the numbers are normalized concerning seating capacity. Based on the validation study, it is possible to derive a mathematical model for converting the spread value of XY coordinates (variance) to a peer effect level corresponding to the same grading interval used by the two observers from Study 1A (1 to 5). Figure 5 illustrates a curve that extends over 5 hours, and the result is derived from the mathematical model. The scale is between 1-5, with 5 indicating a high level of interaction, while 1 means that group members more or less work without interacting with the others. The group arrival and departure are not included, as this part is very data noisy and misleading if applied as input to the mathematical model.

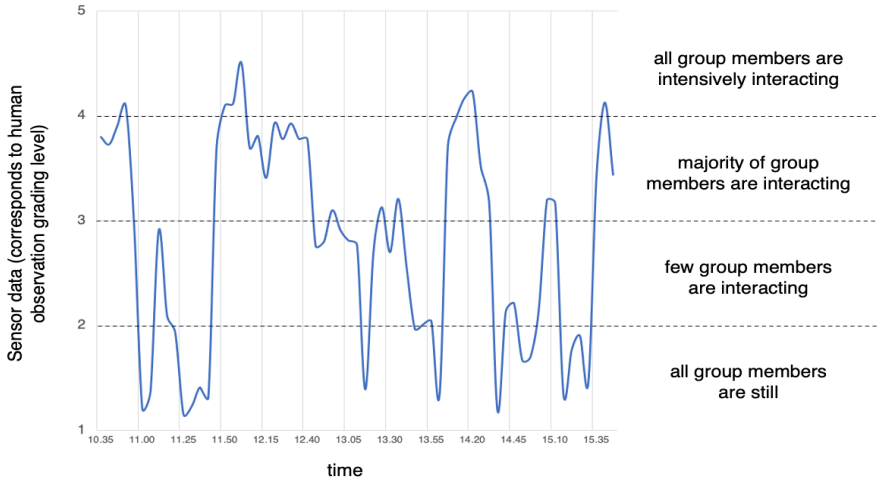

Figure 5. For a selected group of 3 members a time plot of peer effect level shown over 5 hours of stay.

The XY variance of the coordinates is converted to peer effect levels for all groups of 2, 3, and 4 members. Subsequently, the peer effect levels are associated with the space attributes, locations, and table types as well as the group sizes. This analysis enables the identification of statistical significance on whether a correlation exists between the specific space attributes and the level of peer effect.

Peer effect level and Table types

Based on mean values for interaction, rectangle tables host groups with higher peer effect levels, followed by oval tables, small round tables, and large round tables. With the high number of users involved and distributed on the different table types, it has been possible to make solid statistical observations. The rectangular tables were statistically significantly different compared to both the small round tables ($p < 0.10$) as well as the large round table ($p < 0.05$). This difference was not evident compared to the lower mean peer effect level at the oval tables. On the other hand, both the oval and small round tables were statistically different compared to the large round table ($p<0.10$).

Peer effect level and Locations

Comparing the mean values for locations ranks the six zones: D, F, E, C, B, and A. Zone D, the highest-ranked location, is positioned in the middle with average passing through traffic and surrounded mainly by neighbouring workspaces and one window. Compared to the lowest-ranked locations, Zone B and A, the difference is statistically significant ($p<0.05$). Zone B and A are characterized as corner areas with very limited passing through traffic and fewer workspaces as surroundings, but window view and walls. The entrance areas, Zones E and F, also show statistical differences compared to Zones A and B ($p<0.10$). In contrast, the remaining comparisons between the different zones did not qualify as statistically significant.

DISCUSSION

The improving functionality and falling prices of advanced technologies makes complex sensor systems more available and feasible for large-scale and longer-term studies, enabling new opportunities for behavior analysis to reveal the influence of interior spaces on human behavior. In this study, we investigated the use of an indoor sensor system to objectively and non-intrusively measure the level of peer effect level (social interaction or group collaboration). The purpose was to present a new approach to use sensors in buildings to understand how students use and work in a learning environment and how this information can be communicated to interior designers to improve spaces to accommodate the changing needs of the users better.

In particular, the Covid pandemic exposed the vulnerability lurking in our society. We changed our behavior at work, school, and even in our homes from one day to another. Our societal infrastructure, including the physical circumstances, was challenged. What functioned yesterday had no contribution the day after. Whether we will experience such an upheaval cannot be ruled out but having statistically validated tools ready to inform us about how an environment best meets the users' needs is proven necessary. Since advanced non-invasive sensors can measure all users in large spaces over a longer period, a new era of analytical approaches becomes available to the profession of architectural interior design. As data volume grows, machine learning tools will provide a more profound and precise understanding of the correlation between interior design and user experience.

The model can be nuanced by adding the group's task type as an additional marking/labeling during the validation studies. The study assumes that the model is independent of the nature of the group's task. This applies both to groups where the members work to a greater extent in parallel but on their specific independent assignments and groups where the members have to exchange knowledge to a greater extent.

This study introduced a method to convert head movement within a group of 2-4 members into a quantitative measure related to the peer effect level. Sensor and analytical-based output showed to be statistically significant and highly correlated with manual observation ($r=0.70$, P.E.r.=0.0520, $p<0.01$) and group member feedback ($r=0.55$, P.E.r.=0.0395, $p<0.01$). Findings also showed consistency with previous studies, highlighting location as a decisive parameter. In particular, the results by Augustin[25] indicate that spaces placed in circulating areas are more likely to enable collocative work. These findings support our measurements, indicating Zones D-F being the most collaborative spaces. In contrast, the more isolated spaces such as Zones A and B proved to be hosting groups being least collaborative or socially engaged.

Previous studies also emphasized the importance of seat orientation, eye contact, and proximity as an enabler of peer effect. These studies also fall in line with our statistical analysis of the significance of furniture on peer effect. A significant statistical difference between different table types showed. Critically poor was the large round table compared to the rectangular table ($p<0.05$) as well as to the oval and small round tables ($p<0.10$). This lack of supporting or enabling group peer effect is not a surprise since the large round table lacked the opportunity for users to sit near each other and have easy eye contact.

In line with multiple neuroscientific, psychological and behavioral studies, this research project also demonstrate the existing interaction between the environment and our movement and interaction with others.[26] Chandrasekaran[27] reports that the environment is a supportive element in maintaining our cognitive abilities.

Compared to earlier behavioral analyses, this study uses macro-level movements to understand behavior. In contrast with previous observational methods, this study manages to differentiate itself at a crucial point. It is now possible to develop mathematical models capable of producing a quantitative output that maps groups and individual users' movement as an indicator of peer effect levels. Our behavioral change due to the pandemic is both understandable and noticeable, and however, people also continually change needs and behaviors without the underlying cause being clear or explicable.

The traditional static approach to analyzing behavior in different environments, including schools and education, should be performed ongoing rather than when considered necessary. Human productivity is lost when there is a poor match between users' needs and behavior, and the surrounding environment. Therefore, the utilization of technology is encouraged to build intelligent spaces to independently and ongoing sense, analyze, and provide recommendations on improving the space's interior design.

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LEARNING AS A SPATIAL PHENOMENON – PART 1 & 2

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"The emphasis on finding and describing "knowledge structures" that are somewhere "inside" the individual encourages us to overlook the fact that human cognition is always situated in a complex sociocultural world and cannot be unaffected by it." [1]

LEARNING AS A SPATIAL PHENOMENON PART 1

"An online art school isn't an art school",[2] he said. Yet, given an entire academic year had been successfully mediated through the web, was there any truth in this statement? much as hours and hours of Zoom tutorials, lectures, crits, seminars, meetings, and assessments were exhausting. One cannot forget that without technology, and our combined efforts, entire year groups across the world would not have been able to continue their education. Rather than dismiss what had collectively been achieved, could we not, instead, take this statement and view it as a genuine opportunity to consider what had been learned before reverting to past ways of thinking and working?

The catalyst for this paper is therefore the desire to challenge the notion that an online art school isn't an art school. Importantly, by focusing upon the art school studio. Chosen principally, due to its significance as a space that enables the development of 'independent creative practitioners'.[3] As such, I will therefore begin by highlighting its uniqueness as a location for learning, and conclude by moving the discourse surrounding material space outwards, and beyond the tangible. The rationale for this particular focus has been driven by several observations. Firstly, the studio's importance as a multifaceted learning and teaching site[4] Secondly, an acknowledgment of how precarious the studio has become as a result of managerialism, and the massification of higher education.[5] And lastly, research relating to increased (online) student attendance as a result of lockdown restrictions driven by COVID-19.[6] When considered as a whole, it becomes clear than an opportunity now presents itself to explore 'site' beyond the physical. Specifically, if a virtual studio could function in the same way as the traditional studio. However, as this site is also a place for making, new ideas surrounding the immaterial artwork will also be considered.

To assist in the development of this proposal, I will firstly seek to articulate the complex nature of the studio within art, design, and architecture education. Secondly, I will look beyond this context to identify a suitable educational philosophy; one that will translate seamlessly from the real world into the virtual world. Thirdly, I will consider the benefits of Studio VR and the appeal of neo-materiality. And lastly, I will propose a new curricular model that will accommodate change.

The Spatial Ontology of the Studio

"Where shall we look for explanations of human cognitive accomplishment"[7]

When something we hold dear to us is under threat, the only real course of action is to delve deep, pull on every one of our resources, and speak unequivocally on the merits of our passions. In 2019, and in an attempt to save the studio from further uncertainty, James Corazzo, Principal Lecturer in Graphic Design at Sheffield Hallam University, did exactly this.

Troubled by the precarious nature of the studio, as a result of new managerial strategies, and the growth in student numbers driven by changes in funding.[8] Corazzo diligently carried out a systematic review of literature on the subject of the studio in art, design, and architecture education. Subsequently, identified a number of themes. These were as follows;

1.The studio-as-making: understood as a place where artefacts and selves are made
2.The studio-as-bridging: understood as a bridge between the academic and the professional art, design, and architecture contexts
3.The studio-as-meaning: understood to confer meaning/s on educational activities
4.The studio-as-enabling: understood as a place that constrains activities, experiences and interactions
5.The studio-as-backgrounding: understood as the background to the activity of learning
6.The studio-as-disciplining: understood as the place that expresses and shapes disciplinary identities

However, extensive as this search was, Corazzo concluded his research by acknowledging that none of the authors had taken time to consider the significance of the '*material space'* itself. Importantly, the contribution material space makes in the thinking process[9]. It is with an acknowledgment of what was discovered missing from the discourse surrounding the studio in art, design, and architecture education that I'd like to now develop further. Crucially, if one considers the six separate functions of the studio, identified by Corazzo, as an interconnected whole, I believe the material space of the studio, and those who occupy it can therefore be representative of a multifaceted knowledge system. Importantly, one that helps facilitate, support, and embodies cognition. Having reflected on the six themes previously identified, I'd therefore like to further the studio debate by inclusion of the following observations.

The Studio-as-Framework for Distributed Cognition

".... environments create the emotional tenor of the learning experience"[10]

If one considers Soviet psychologist Lev Semyonovich Vygotsky's Zone of Proximal Development theory[11] and locates it within the context of the studio in art, design, and architecture education, what subsequently occurs is of particular interest when attempting to theorize what takes place within this site. Additionally, what becomes evident when one studies ZPD is that it contains several characteristics that are strikingly similar to qualities associated with the studio. In order to highlight the significance of this correlation, one must firstly understand the schema of the art school/academic studio.

To begin with, the academic studio is a designated space within the institution, where every student is given a place to think, to reflect, and to make work.[12] This will also include; partitioned walls, a desk, a chair, and access to power.[13] Historically, the design of the academic studio has been based around a large room with a number of windows that let in natural light. The size of the studio space may vary depending on the institution, and will also vary depending on the size of the group occupying the studio space. However, regardless of its overall size, the total area will be carved up into smaller spaces to provide a place for students to work, think, and make. Fairly rudimentary facilities yet, the studio has been acknowledged as the only space where the artists/student's thought process is made evident and seen through the actions of the artist/student themselves.[14]

To understand ways in which Vygotsky's theory of cognitive development assimilates itself into the discourse of the studio, it is important to begin by considering Vygotsky's theory of socio-cultural

development.[15] Notably, the very principle of ZPD is understood to represent the distance between the actual development level as determined by independent problem solving, and the level of potential development as determined through problem-solving under adult guidance.[16] In other words, the educational collaboration that occurs with what Vygotsky described as a 'more knowledgeable other' (MKO). As the studio space within the context of art, design, and architecture education is occupied by students and staff of differing interests and skill levels, those who occupy the material space of the studio quite clearly represent the basic principle of Vygotsky's understanding of 'more knowledgeable others'. In terms of how this idea relates directly to individual learning, as understood by Vygotsky, we must carefully consider the basic premise of how cognition occurs through the presence and support of MKOs.

For Vygotsky, the emphasis here is what takes place during the 'inter-mental' process. Crucially, the cognitive activity that occurs at the point where the learner and the MKO reach a shared understanding. Defined as 'intersubjectivity'. For the learner, by achieving 'intersubjectivity', 'internalisation' subsequently occurs. This cognitive process develops further through thought and is later expressed via language.[17] However, in terms of cognition within the studio context, an additional aspect in the process of inter-mental, intersubjectivity, and internalization occurs, and purposely through a range of physical effects. These include; the artists' preparatory sketches, their visual research, their desktop paraphernalia, and the artefacts they make.[18]

Scaffolding

"...whatever happens there is part of a larger computational system"[19]

Vygotsky was not alone in understanding the important role others play in cognition and learning. Clear parallels can also be drawn with the American cognitive psychologist Jerome Bruner's (1915-2016) social constructivist theory[20]. Like Vygotsky, Bruner understood the importance of others in the process of learning. However, to understand Bruner's learning theory, it is important to acknowledge that his interests lay firstly in language acquisition. Importantly, how a child's language developed with the assistance of another; identified as a parent or caregiver. In this instance, Bruner was specifically interested in how a child's language develops whilst learning to read with support from a parent or caregiver. This 'other' can therefore be understood to represent Vygotsky's MKO. It was through this joint activity that Bruner believed a process of 'scaffolding' took place. For Bruner, scaffolding was understood as the process that occurred due to the reciprocity that developed between parent (or caregiver) and child. Identified as cognitive development, established at the precise point where the child's reading and language skills were understood to have progressed through the process of assistance. It was a recognition of this pivotal stage in a child's cognitive development that subsequently allowed the parent or caregiver's role as educator to lessen.[21]

Within the discourse of the studio in art, design, and architecture education, it is therefore an acknowledgment of the manner in which cognition occurs with the assistance of a supportive relationship that is of note.[22] Notably, that scaffolding occurs within this site as a result of the interactive role played by others in a student's learning. Understanding ways in which space and others, inform, support, and enable cognition is not a new phenomenon. Take for instance the crucial role the navigation bridge and team of Palau, a US naval ship, played in Professor Edwin Hutchins theory of cognition.[23] In this instance, both location and crew were considered to collectively represent a cognitive and computational system. In my mind, this system conceptually is not too dissimilar to that of the studio, those who occupy it, and the learning activities contained within it. What does differ, however, is that within the studio environment cognition and computation is made visibly manifest through preparatory sketches, visual research, desktop paraphernalia, and artefacts. This observation is key when attempting to understand the multifaceted educational complexity of the studio environment.

The Studio-as-Apparatus for Visual Cognition and Computation

"It does not seem possible to account for the cognitive accomplishments of our species by reference to what is inside our heads alone. One must also consider the cognitive roles of the social and material world."[24]

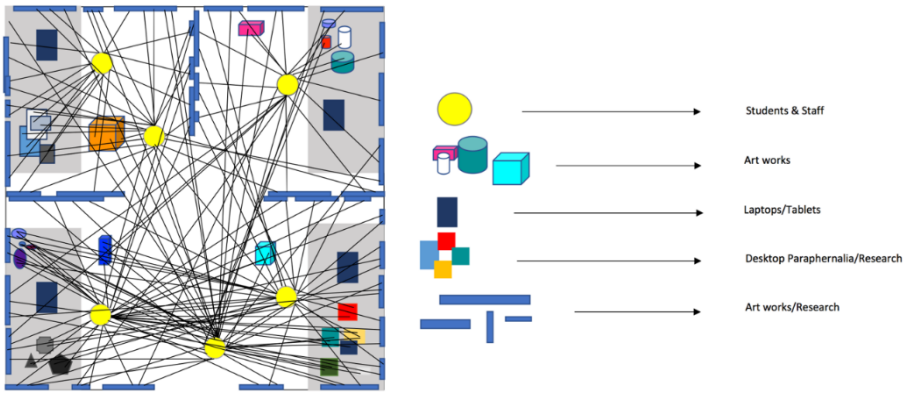

Figure 1. The studio as multifaceted knowledge system[25]

The difference between site for learning and site of learning can be seen quite clearly the moment one enters the studio setting. Even an empty studio has a story to tell. Is it the beginning of a new academic year, or is it the end of one? Regardless of occupancy, the material space of the studio; its walls, desks, and floors play important roles in cognition and computation. Considered '*artful surfaces*',[26] these rudimentary planes provide the artist, designer, and architect space for thought to be made manifest, and through a variety of means that includes visual and textual research, sketchbooks, drawings, images, sound, and objects. A multidirectional semiotic system if you will: one that provides tangible insight into the inner workings of the creative mind, whilst also assisting further internal computation due to outward representation and display. In essence, a cyclical process from internal cognition to external processing and back again. What occurs between both sites forms a complex process of reciprocity that leads to the development of new ideas, that once more become visibly manifest. An iterative process that feeds back on itself in perpetuity. However, as the studio is a shared learning environment, this visual information can cut across space. Therefore, acting as further stimuli in the cognitive process of creative individuals and, as a result, plays a part in the learning experience of others.[27]

The parallel being drawn here is the correlation between site for learning and site of learning. In other words, the relationship between the function of the studio, and the function of the brain. Notably, the prefrontal cortex; a part of the brain associated with creative individuals.

THE STUDIO FUNCTION	PREFRONTAL CORTEX FUNCTION
The studio-as-making: Understood as a place where artefacts and selves are made.	Organising thoughts and problem solving.
The studio-as-bridging: Understood as a bridge between the academic and the professional art, design, and architecture contexts.	Ability to balance short-term rewards with long term goals.
The studio-as-meaning: Understood to confer meaning/s on educational activities.	Shifting/adjusting behaviour when situations change.
The studio-as-enabling: Understood as a place that constrains activities, experiences and interactions.	Forming strategies and planning. Focusing attention. Considering future and making predictions.
The studio-as-backgrounding: Understood as the background to the activity of learning.	Impulse control and delaying gratification.
The studio-as-disciplining: Understood as the place that expresses and shapes disciplinary identities.	Inhibiting inappropriate behaviour and initiating appropriate behaviour.
The studio-as-backgrounding: Understood as the background to the activity of learning.	Simultaneously considering Multiple streams of information when faced with complex and challenging information.
The studio-as-disciplining: Understood as the place that expresses and shapes disciplinary identities	Foreseeing and weighing possible consequences of behaviour.
	Modulation of intense emotions

Table 1. The relationship between the function of the studio and the function of the brain

When attributes associated with both sites are considered side by side it becomes clear that a distinctive form of symbiosis occurs, underscoring the unique relationship between the artist and the studio. The bond between both is undeniable; they are inextricably linked. Before any more arts institutions are forced to choose economics over studio provision it is, therefore, crucial that this important connection is not eroded further. A possible solution to the dilemma faced by many arts institutions today is to fully embrace Charles Renfro's' 2009 proposition, that "*walls will be a thing of the past*". [28] Afterall, Aristotle understood the meaning and value of an education experienced beyond walls.[29] Innovatively and conceptually speaking, is the institution of art not then the precise place where the very meaning of studio walls can be challenged and reconsidered further?

The Many Benefits of Studio VR

A significant amount of change has occurred since the critic, Andrew McGettigan, wrote *The Great University Gamble* in 2013.[30] Economics have worsened, student numbers have increased, student satisfaction is at an all-time low, rents have risen, energy prices have taken a hike, the cost of living has skyrocketed, mobility has become restricted, and the jobs market has become even more precarious. When laid out in this manner, the spreadsheet is clearly in deficit. However, for the art school, the prognosis has long been bleak.[31]. But what if some of this uncertainty could be addressed by the inclusion of a simulated component? Where the provision of material space is no longer an

issue, the pressure felt by institutions from students to provide greater access, more resources, and better value for money could be partially solved. If recent research asserts that learning in the virtual realm provides learners with an experience as tangible as learning in the physical world is indeed the case.[32] What's stopping the very space where ingenuity and risk-taking are encouraged[33] from extending their remit further?.[34]

In other educational fields, it has become increasingly clear that there are many advantages to the immersive and interactive quality inherent to VR technology. Where the provision of simulated learning environments has been credited for helping improve and advance education. From improving concentration to enhancing creative performance through self-learning, whilst also increasing motivation and raising overall student satisfaction[35]. In addition to this range, it has been suggested virtual engagement also helps stimulate positive states[36]. The full extent of this proposition can be seen in why learning in VR has been described as a psychological process; where mental processing occurs via complete immersion activated through motor, spatial, and emotional engagement[37].

When attempting to formulate an appropriate VR learning philosophy for arts education, immersion as a psychological process must, therefore, be included as a necessary 3rd component. Identified specifically to help further highlight the connection between the function of the studio, and the function of the pre-frontal cortex.

Establishing a VR Learning Philosophy for Arts Education

THE FUNCTION OF THE STUDIO	PREFRONTAL CORTEX FUNCTION	IMMERSION AS A PSYCHOLOGICAL PROCESS
The studio-as-making: Understood as a place where artefacts and selves are made.	Ability to balance short-term rewards with long term goals.	Sensory motoric immersion
	Focusing attention.	
The studio-as-bridging: Understood as a bridge between the academic and the professional art, design, and architecture contexts.	Impulse control and delaying gratification.	
	Inhibiting inappropriate behaviour and initiating appropriate behaviour.	
		Cognitive immersion
The studio-as-meaning: Understood to confer meaning/s on educational activities.	Foreseeing and weighing possible consequences of behaviour.	
	Shifting/adjusting behaviour when situations change.	
The studio-as-enabling: Understood as a place that constrains activities, experiences and interactions.	Modulation of intense emotions.	
	Simultaneously considering Multiple streams of information when faced with complex and challenging information.	Emotional immersion
The studio-as-backgrounding: Understood as the background to the activity of learning.	Organising thoughts and problem solving.	
The studio-as-disciplining: Understood as the place that expresses and shapes disciplinary identities.	Considering future and making Predictions.	
	Forming strategies and planning	Spatial immersion

Table 2. Further correlation between the function of the studio and the function of the brain

For the art school, I firmly believe the benefits of providing studio space negotiated through virtual reality are, therefore, manifold. The following are just a few of the many advantages that spring to mind.

1.24/7 access

2.Economic hierarchies are flattened

3.Greater student and staff mobility
4.Provides greater accessibility
5.Inclusion rather than exclusion
6.Creates a geographically diverse student body
7.Supports a geographically diverse faculty
8.Generates intercultural communication and collaboration
9. Helps decolonise the curriculum
10.Gives access to a wider range of technical expertise
11.Running cost are reduced
12.The discourse surrounding materiality advances
13Technical skills are further developed
14.Creative adaptability
15. Material costs for students becomes a thing of the past
16.The digital artefact is developed further
17.Richer networks are created both personally and professionally
18.Advances skill and knowledge for the changing labour market

Interestingly, many of these benefits supersede recent government policy on 21st Century learning skills, and graduate attributes,[38], whilst also addressing a range of curricular, inequality, accessibility, and employability issues raised by our critically aware cash strapped students.[39] However, the many benefits offered in the virtual realm for art students do not simply end there.

The Subjects of the Arts Institution & the Appeal of Immateriality

On May 7th, 2015 the American Art Historian, Lane Relyea, spoke eloquently on new developments within the art institution. Previously, the art school discourse fixated on what was made, how it was made, and the milieu in which this work was created. Relyea instead drew our attention away from the art object to focus firmly on the art subject. Namely, students. Why? Because a recent development within the art school debate was emerging, where greater emphasis upon decentralised activities, orchestrated by the postgraduate student body was being established. Defined as "*the low end"*. This was a new movement driven by several key factors. Namely, a growing distrust in the art market, the nepotistic nature of gallery organisations, economic uncertainty, and greater production and distribution caused by advancements in digital technology. This emergent contra-generation was boldly disrupting the system, and at little cost. Beyond the art institution, new forms of decentralised activity were also evident. Precisely three months after Relyea identified this shift,[40] the very first NFT was minted on the Ethereum blockchain. Coincidence or not, the similarities in the need to usurp power dynamics, whilst also questioning value, authenticity, ownership, and accessibility are undeniable.

However, as student de-centralised activities grew, rapidly infiltrated undergraduate courses with a renewed DIY philosophy,[41] little change occurred in the need for the production of physical artefacts. Post conceptualism, one would have thought art-making and objecthood would have been challenged further. After all, advancements in digital technology had provided art students with a plethora of skills and output options for decades. Yet, within the fine art context, little progress has been made in terms of digital adaptability.[42] Given the level of scrutiny objecthood has been subject to through modern,[43] and postmodern debate,[44] one would have imagined the next obvious development as we entered a hypermodern epoch would have propelled the debate surrounding matter far beyond the 4th dimension. Indeed, this has been the case for subjects such as design, gaming, and architecture. However, from a fine arts perspective, the innovative technologies used in these 'other' fields have yet to be fully understood and, as a result, their capabilities remain under-explored.[45]

Interestingly, one aspect that could halt this development further is an observation that the undergraduate fine art technophobe has returned. Since returning to campus after numerous Covid related restrictions, the demand for hands-on skills has increased exponentially. The need to touch and feel now seems crucial. One example of this is evident in the rise of analogue photography and alternative processes; mediums that are currently resurging within art school facilities.

For the purpose of this paper, this commentary may at first appear counterintuitive. However, as the driving force behind any hypothesis is to disprove or validate myths and assumptions, the proof will surely lie in the testing of such theories. If one considers recent advancements in haptic technology alone I, wholeheartedly, believe introducing a suite of virtual technologies that include Quest2 all-in-one headsets, Bhaptics VR haptic gloves, Gravity Sketch, Open Brush, SculptureVR, 3D scanning, and advanced 3D printing into the curriculum will be invaluable additions. Crucially, not only in helping to address the recent loss in hand-skills but, more importantly, in the development of arts education across the board.

The benefits of creating a VR studio component are indeed manifold; from helping to finally bridge the analogue/digital divide, to increasing studio engagement through technological and physical immersion, extending students' educational experience and skill base, whilst also advancing the discourse surrounding neo-materiality.[46]

How Will Studio VR Function in the Curriculum?

Professor Nicholas Houghton, the arts Academic, has long expressed his interest in the development of the fine art curriculum.[47] His most recent observations highlight an urgent need to re-consider its cumulative configuration. Identified as having six elements; apprentice, academic, expressive, formalist, professional, and conceptual (see interpretation below). Concerned by its growth, Houghton, therefore, pondered its relevance in, and for, a new era.[48] A necessary deliberation.

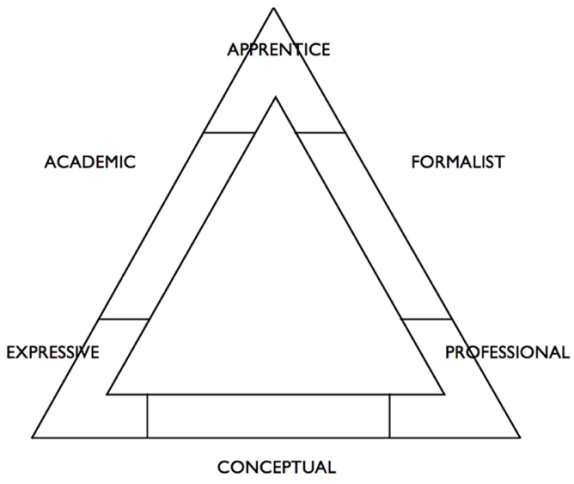

Figure 2. - 6-into-1 curricular model

However, over the last two years, having personally spent time interviewing academics, technical staff, and students from several art institutions in the UK and Europe on the subject of current fine art education, it quickly became clear that no one interviewee could agree on a definitive syllabus fit for there 21st Century. Houghton himself proposes the need to reconfigure. Yet, under scrutiny, all six elements still appeared to inform the ideas, theories, and work of the individual interviewed. As a result of these findings, rather than reduce curricular components I, instead, propose two additional elements. Crucially, immersive and meta. To articulate how their addition becomes a workable and

sustainable eight-into-one model, I'd therefore like to suggest the following flexible curricular framework. A theory I'd like to refer to as 'elastic pedagogy'.[49]

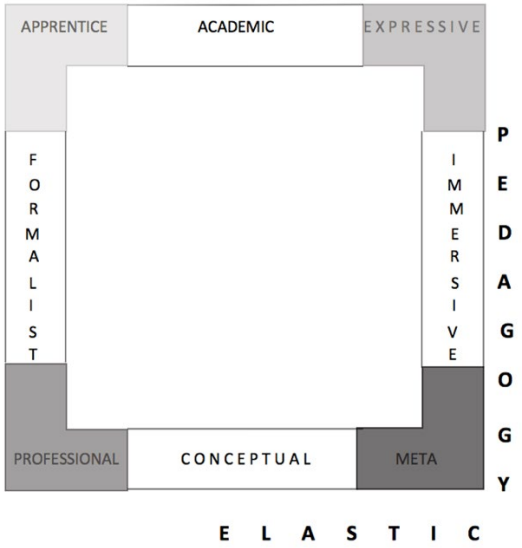

Figure 3. - A new 8-into-1 curricular model[50]

If one configures the six curricular components identified by Houghton into a square, a portion of this construction, subsequently, becomes empty. As a result, I propose the remaining quarter becomes a transitory space; one that allows for curricular flexibility. However, the success of this additional facet will be in its futureproof nature, as this void can only ever be utilised for technical and theoretical expansion. Once its function and meaning have entered the mainstream, two new elements will act as replacements. For progression and development to occur, the curriculum should always be under construction. I, therefore, believe this new 8-into-1 curricular model creates the space and understanding for this to become possible.

LEARNING AS A SPATIAL PHENOMENON – PART 2
Studio VR Theoretical Framework

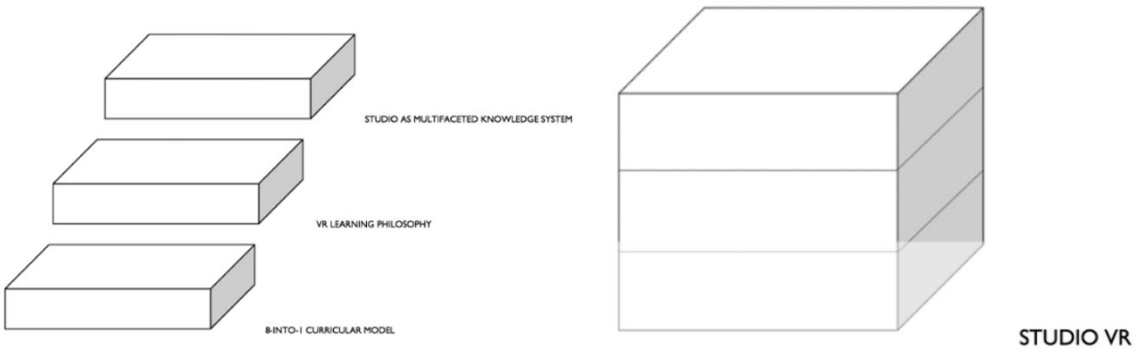

Figure 4. – Studio VR

To test the viability of Studio VR as a workable educational philosophy and model, beginning with a one semester pilot study is the next obvious step. At present, the very foundations of Studio VR are being established to also accommodate five additional portals; a technical surgery/resource, lecture theatre, library/research archive, gallery, and café. The rationale for their inclusion is to simply provide a range of areas that reflect the art school experience. In essence, Studio VR, as a whole, will function as a small arts institution, where staff and students reside. Currently, several technical and academic staff from three other arts institutions, the HGB in Leipzig, Willem De Kooning Academy in Rotterdam, and ECA in Edinburgh have already agreed to fulfil the teaching and technical instruction required to run Studio VR. All chosen for their breadth of knowledge and expertise. As a team, we will then seek to engage a number of students keen to explore their education beyond the physical. It is anticipated Studio VR will commence as a small-scale preliminary study in January 2023 and run for one semester. Once completed, collectively we will take the form of a focus group. A specifically designed questionnaire will be used to evaluate the experience, and the data collected after analysis will form the basis of a proposal for a longer-term institutionally run project/course.

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REVOLUTIONIZING SPACE TEACHING: SOVIET PEDAGOGICAL METHODOLOGIES (1921-2022)

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INTRODUCTION

There is a demand for new and better methods of pedagogy in architectural education. This study brings an unknown architectural theory (space) out of the Soviet-era revealing the relationship of formalizing, and more explicitly reconceptualizing contemporary architecture teaching. It will reveal the lost historical teaching methodologies through the "Psycho-analytical" method of 'Space' teaching created by the Soviet architect Nikolai Ladovskii (1881-1941). This theory was taught as an experiment at the revolutionary school of architecture called VKhUTEMAS (Higher State Artistic and Technical Studios, Vysshie gosudarstvennye khudozhestvenno tekhnicheskye masterskie) in Moscow (1921-1927). Drawing upon research collected over 8 years, this paper analyses the fascinating avant-garde teaching methodology of 'Space' that, one hundred years after VKhUTEMAS' foundation, can still inspire contemporary architectural pedagogy.

Space

During a spring evening in the year 1920 in a cold, poorly lit room at the Second Independent State Artistic Workshops (Svobodnye Gosydarstvennye Khudozhestvennye Masterskie, SGKhM) in Moscow, the outpost of Soviet artistic avant-garde in post-revolutionary Russia you need to finish setting the scene Unlike the departments of painting and sculpture, the Architecture Department is still run by traditionalists. Unknown to anybody in the audience, the future leader of the Rationalist movement, architect Ladovskii stands to speak. He explains about the drawbacks of the old stylistic academic approach to architectural education, which he condemns as a passive imitation that kills live imagination and destroys one's desire to apprehend the real laws and methods of architectural creation. The students in the room are struck by Ladovskii's maxim "Space, not stone, is the material of architecture", which defines the discipline as work within the content of subjective perception.[1] Ladovskii would urge students to think not about the orders and proportions, but about the human who perceives them, arguing that only human emotional and visual perception can form the basis of architectural composition, a position that would later become the cornerstone of Rationalist teaching. Ladovskii later expanded his theory along with his colleagues, Vladimir Krinskii (1890-1971) and Nikolaii Dokuchaev (1891-1944), into his "Foundations" for a theory of architecture through OBMAS United Leftist Studios (Ob"edinennye "levye" masterskie, 1921-1923), inside the newly formed VKhUTEMAS, 1921-1927). The school would later be named VKhUTEIN – Higher State Artistic and Technical Institute (Vysshiye Gosudarstvennyi Khudozhestvenno-Tekhnicheskii Institut, 1927-1930). Ladovskii's teaching became based on what he called the "psycho-analytical method"

(*psikhoanaliticheskiĭ metod*), which sought to instil in the students, from the beginning of their training in architecture, a sense of spatial-volumetric awareness and creative freedom, based on the application of objective methods of analysis of the components of architectural composition. This process incorporated the psychology and perception theories to be delivered to the large masses (*massy*) of students, therefore choosing to align architecture with the new technologies and methods of industrial production.

The Rationalist movement obtained its name from the theory of 'rational' architecture developed by Ladovskii and his associates.[2] Ladovskii defined his conception of "rational" architecture as: "Architectural rationalism is based upon an economic principle just as is technological rationalism. The difference stems from the fact that technological rationalism represents the economy of labor and material in the creation of an expedient structure, while architectural rationalism represents the economy of psychic energy in the perception of the spatial and functional properties of a building.[3] The synthesis of these two rationales in a single structure, then, constitutes a rational architecture (*ratsio-arkhitektura*)."[4] Ladovskii devised his psycho-analytical method of instruction, which sought to inculcate in the student a volumetric and spatial mode of conceptualization deemed essential for the architect.[5] The method not only encompassed the Rationalists' comprehensive program for teaching design but elucidated the core of their architectural theory as well. Ladovskii expanded this theory into his 'Foundations for a theory of architecture within VKhUTEMAS stating: "Architectural rationality is founded on the same principle of economy just as technical rationality is. It is a synthesis of these two forms of rationality into one building that creates ratio architecture."[6] He continued by saying: "Architecture operates by means of these 'properties' as specific quantities. The architect constructs a form, bringing together elements which are not technical or utilitarian in the normal sense of those words, and which can be looked upon as 'architectural motifs.' In the architectural respect these 'motifs' must be rational and must serve the higher technical requirement of the individual to orientate man in Space".[7]

At the beginning, the new teaching experiment 'Space' remained separate from the VKhUTEMAS curriculum and was tested in the 1921-23 timespan through selected number of students during OBMAS (*Ob'edinennye "levye" masterskie*, United Leftist Studios, 1921-1923), where Ladovskii and his colleagues developed the Psycho–analytical method.[8] The framework for an active program, demanding rigorous application and continual adjustment during OBMAS which supplied the ultimate arena to refine the pedagogy of 'Space'. Here, the essential Rationalist concepts of dynamic spatial form were applied within the exacting framework of a comprehensive program incorporating the new principles and methods for architectural design.[9]

Four Categories of Expressive Qualities
1. Geometrical: Relationship of the sides, edges, angles, characteristics of surface
2. Physical: Weight, density, Mass
3. Physico-mechanical – Stability, mobility
4. Logical: Expressiveness of surfaces, character as such and of delimiting volumes. According to the expressiveness, sizes and quantity we may speak of: A: strength and weakness B: greatness and smallness, C: finiteness and non-finiteness[10]

Table. 1. Ladovskii's Four Categories of Expressive Qualities, constructed by author

Ladovskii advanced four categories of expressive qualities as a curriculum that operated simultaneously and interactively within any given form (Table 1). Ladovskii categorizes so-called 'Expressive qualities' which provided the basis for the Rationalist's mode of communication, supplying how they not only determined spatial form patterns but also comprehended and interpreted man's temporal experience. "In perceiving material form as such," Ladovskii explained, "we can at the same time perceive the qualities of expressiveness within it". The first was "Geometrical", which

made possible the perception of the geometrical properties of form by indicating the relationships of sides, edges, angles, and surfaces (fig 1). The second, or "physical", involved the visual effect of an appearance of weight and mass, or the force of gravity, acting on a form that define the visual manifestations of the force of gravity acting on that form (fig 1). The third quality, encompassing the "Physico-mechanical" properties of form, concerned the perception of dynamic states of equilibrium between elements appearing at rest and those appearing in motion within a form perceived through the kinesthetic sensation, which concerns its relative stability or movement (fig 1). The fourth quality, which Ladovskii termed the "logical", focused on perceiving the significance of the surface, or plane, both as a formal clement and as a device marking the boundaries of a volume (fig 1). Ladovskii's four categories of expressive qualities, conceived as articulate metaphors of gesture and movement, were intended to embody architecture capable of enrichment on a formal level by both intellectual and emotional content. The student had to provide for the possibility of capturing the observer's imagination through his awareness of space by creating sufficient perceptual clues for measuring and detecting key spatial relationships."[11]

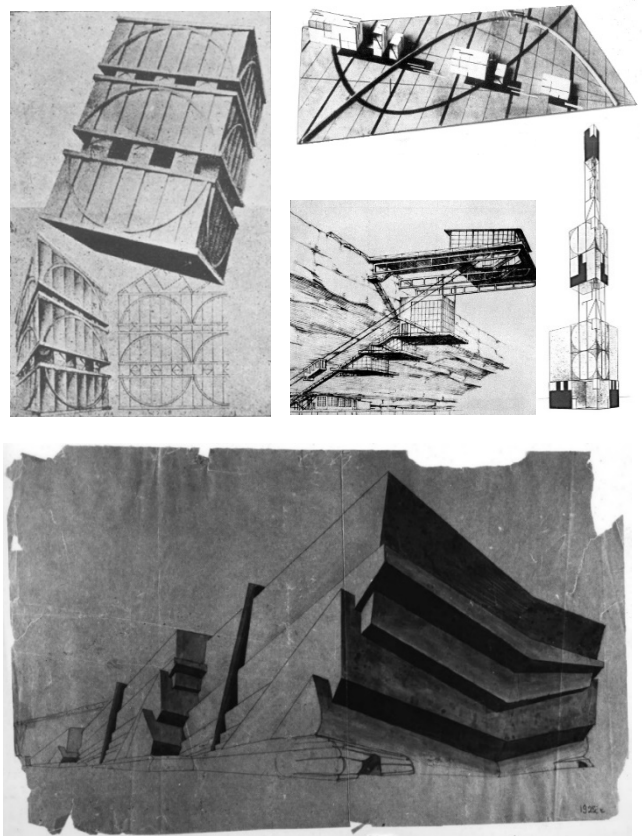

Figure. 1. Ladovskii's Four Categories of Expressive Qualities. Top left: V. A. Petrov. Parallelepiped. Abstract Assignment on Exposure of Form (1920). Top right: Lamtsov 1922 Revelation of Dynamics, Rhythm, Relationships, and Proportions horizontally (1923). Right middle: Lamtsov 1922 Revelation of Dynamics, Rhythm, Relationships, and Proportions (Vertically) (1924). Middle: Restaurant and landing platform on a cliff project (1923). Bottom The articulation of mass and weight, (1922)

The lack of research-led teaching on the effectiveness of architectural theory on experimental pedagogy of space reflects its complexity requiring contemporary approaches to stimulate new architecture thinking. It is worth noting unsustainable ad-hoc initiatives, pedagogically informed or otherwise, have created a sense of 'initiative fatigue' within teaching inhibiting the traction necessary for new methods to flourish rather than delivering just 'another project.' This situation raises

fundamental questions about design education that continue to resonate today: Is there an alternative to the contemporary academic method of architecture teaching through space? Is it even possible? The questions in this study are not, ‘What is the correct way to teach architecture?’ but more specifically, ‘Can unknown methods be introduced to achieve better design?’

This research was tested and collected over 8 years at the Liverpool School of Architecture (LSA) and the Birmingham School of Architecture and Design (BSoAD). The methodology used in the framework of Ladovskii’s expressive qualities would be introduced by the students themselves within a variety of taught studio projects on both BA Architecture Courses as a process of experimenting with Space. The ‘psycho-analytical method’ was used as a reference point to help students navigate their spatial design from the beginning. Examples from the 1920’s period (Fig 1) enabled a pragmatic understanding helping the students to foster imagination towards articulate spatial thinking. The students would study through an image analysis process the geometrical properties of volumetric form, the physio-mechanical properties of the form in terms of the concepts of mass and weight and mass and equilibrium, the elements of construction, dynamics, rhythm, and vertical and horizontal relations and proportions understanding how to construct Space analyses and the relationship between volume and Space and understanding the laws of equilibrium. Students were encouraged to challenge Ladovskii’s theory to design their own architectural solutions.

Figure. 2. Student project work for a new Liverpool School of Architecture

Defining the visual boundaries of form by establishing the relationship of its sides, edges, corners, and surfaces consisted in getting the design resulting from the perception of real perspective revealing the forces heretofore hidden beneath the different enveloping planes of its exposed surfaces. Instead of being derived literally from pre-conceive, traditional architectural lexicons of form, these "element-symbols" were moulded to fit the dynamic, ordered building up of a particular facade, energized by visually simulated effects of gravity and movement. By reducing form to its most elementary construction symbols, the student communicated the precise relationships between its adjoining visible surfaces to the observer. Great care had to be taken, however, not to carry the scheme of geometric articulation to a confusing extreme.

Figure. 3. Student project work for a new Liverpool School of Architecture

Elaborating on the conceptual basis of Ladovskii's second "category of expressive quality, that of the physical properties of Mass and Weight students determined weight in architecture to mean the force causing the mass of a form to [appear to] fall downwards under the force of gravity. In this case, the design of a new School of Architecture (fig 4), proposed creating massive horizontal articulation parallelepiped, falling inwards (an interpretation of Ladovskii's theory) that enhanced the overall experience of the weight of his form. The division of mass separation here helped not only to show the mass and weight of the design but also emphasizes the clarity of its form, functional purpose, and a massive form clearly associated with an industrial structure. The formal manipulations employed to stimulate such action in the form were understood by the student having rendered in a way that conveys vividly the degree of its [the forms] visually discernible stability and compactness. The design relied on compositions made up of discrete geometrical elements interlocked in an evident proportional system, by reverting to the deformation of form, however, a rather more complicated balancing of the apparent effects of weight on the form and its constituent parts enters the perceptual assessment of the design.

Through encompassing the mechanical properties of form, the perception of dynamic states of equilibrium between elements appearing at rest and those appearing in motion within a form, such energizing was projected not in a purely mechanical way, but by summoning the observer's intuitive feeling. In this case, the psychophysiological basis for perception, for how gravitational forces in architectural form can be, carried and supported either undisturbed or in contention with disruptive forces down to the foundation was displayed by the student. Just as the physical properties of form were aimed at raising the observer's sensitivity to the appearance of the weight of the building and to the way architectural form carries such weight, so too the mechanical properties were directed through heightening the awareness of the point of equilibrium of the form. The design was intended to heighten the optical impact of that expressiveness by developing the visual simulation of structural qualities such as tension, strain, weight, and load to great effect.

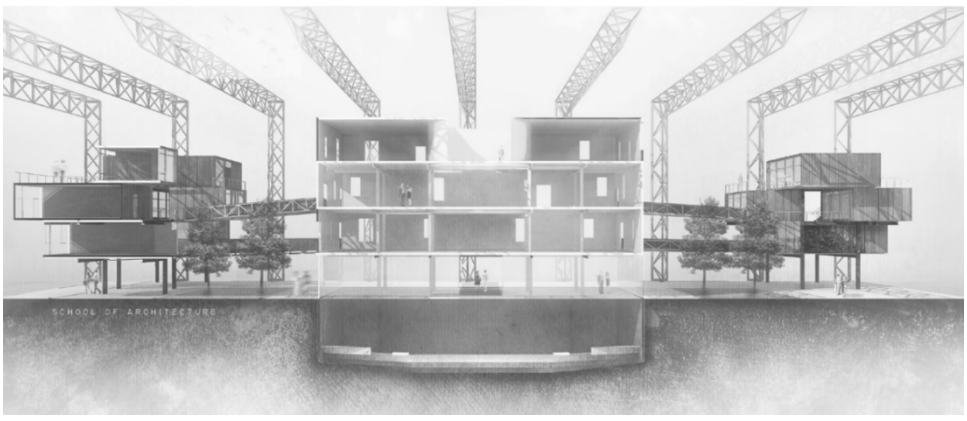

Figure. 4. A building under construction, a new Liverpool School of Architecture

DISCUSSION

The designs by students through the inclusion of Ladovskii's expressive qualities originated from different backgrounds of spatial exploration by analysing the forms at different levels of perception. The commonalities of space were found as an accepted design tool to achieve better architecture. The main consensus of the study was the readability to articulate metaphors of gesture and movement. While the psycho-analytical methods search for a conceptual framework that is used as a useful design tool to generate form, by focussing more on the perception of the solution, it is agreed that the compositional structure of Space and Form is vital for becoming a complete architect. This approach offered a new understanding of Space, looking at different expressive qualities which turned into designs, explaining the formation process at interrelated solutions starting from geometric attributes of form to Revelation of dynamics, rhythm, relationships, and proportions providing a better understanding of Space architecturally.

CONCLUSION

The inclusion of Expressive Qualities introduced by students within contemporary architectural learning can be seen to facilitate useful learning through basic spatial design. Using the theme of 'Revolutionizing Space Teaching: Soviet Pedagogical Methodologies (1921-2022)' reveals it is possible to bring Soviet teaching methods into the architectural studio if only by abstractly providing an alternative approach to studio projects to teach how to design with an element of space. It further allowed students to apprehend the real laws and methods of architectural creation and to think not about the orders and proportions, but about the human who perceives them, where the role of human emotional and visual perception can form the basis of architectural composition, capturing the observer's imagination through his awareness of space by creating sufficient perceptual clues for measuring and detecting key spatial relationships.

NOTES

[1] See Khan-Magomedov, Selim Omarovich, *Nikolai Ladovskii.* Russian Avant-garde Foundation: Architecture-S Publishers, p. 25, 2007.
[2] See Rationalism and Formalism Khan-Magomedov, Selim Omarovich, *Pioneers of Soviet architecture: the search for new solutions in the 192s and 1930s*: London: Thames and Hudson, p 543, 1985.
[3] Ladovskii's own writing suggests, however, that the prime impetus for his interest in perceptual psychology as a motive force in architectural design was provided by the work of the German American psychologist – Hugo Munsterberg (1863-1916)
[4] Nikolai Alexandrovich Ladovskii, *"Osnovy Postroeniia teorii arkhitektury (pod znakom ratsionalisticheskoi estetiki)" [The Foundation for Constructing a Theory of Architecture (Under the Banner of a Rationalist Aesthetic)],* Izvestiia ASNOVA, no- 1 (1926), 3. Translation by author Russian original: Архитектура оперирует этими „качествами" как определенными величинами. Архитектор конструирует форму внося элементы, которые не являются техническими или утилитарными в обычном смысле слова и которые можно рассматривать как "архитектурные мотивы". В архитектурном отноше нии эти "мотивы" должны быть рациональны и служить высшей технической потребности человека ориентироваться в пространстве.
[5] Anatole Senkevitch, Jr, *Trends in Soviet Architectural Thought, 1917-1932 The Growth and Decline of Constructivism and Rationalist Movement*. Ph.D. Thesis Cornell University: U.S, p 301, 1974.
[6] Khan-Magomedov, Selim Omarovich, *Pioneers of Soviet architecture: the search for new solutions in the 1920s and 1930s*: London: Thames and Hudson, p. 545, 1985.
[7] Nikolai Alexandrovich Ladovskii, *Izvestiia ASNOVA, Osnovy postroenija teorii arhitektury (Foundations for building a theory of architecture) Proceedings of the Association of New Architects*. Moscow, p. 3, 1926, Translation by author Russian original: Архитектура оперирует этими „качествами" как определенными величинами. Архитектор конструирует форму внося элементы, которые не являются техническими или утилитарными в обычном смысле слова и которые можно рассматривать как "архитектурные мотивы". В архитектурном отноше нии эти "мотивы" должны быть рациональны и служить высшей технической потребности человека ориентироваться в пространстве
[8] Khan-Magomedov, Selim Omarovich, *Pioneers of Soviet architecture: the search for new solutions in the 1920s and 1930s*, London: Thames and Hudson, p. 107, 1985; Khan-Magomedov, Selim Omarovich *Psikhoanaliticheskiĭ metod N. Ladovskogo vo VKHUTEMASE–VKHUTEINE: ob"edinennye levye masterskie; psikhoanaliticheskaia laboratoriia*, Moskva: Arkhitektura, p. 194, 1993. Further advancements in Ladovskii's own theory suggest his interest in perceptual psychology as a motive force in architectural design. Arguing for the necessity of a laboratory for creating 'Space', Ladovskii referred to the work of the German-American psychologist Hugo Munsterberg (Harvard University): "A widely developed psychotechnics can, in the future, make its own demands of composers, even if it were constantly confirmed that genius finds unconsciously that which science develops with great effort"; see Alla Vronskaya, *Composing Form, Constructing the Unconscious: Empiriocriticism and Nikolai Ladovskii's 'Psychoanalitical Method of Architecture at VKhUTEMAS*, 2016 in John Shannon Hendrix, and Loren Eyan Holm (eds.) *Architecture and the unconscious,* Farnham: Ashgate, pp. 77-96; and Anatole Senkevitch, Jr, *Aspects of Spatial Form and Perceptual Psychology in the Doctrine of the Rationalist Movement in Soviet Architecture in the 1920's*, 1983.
[9] The program was constructed to provide for a gradual increase in the difficulty of 'abstract' problems in spatial forms (see Khan–Magomedov, 1993, p. 194). While the psycho–analytical methods used as a design tool for generating form, by developing a process of teaching without precedent, 'Space' focused more on the perception of the creation of architectural idea as opposed to material and function. Bokov, translates seven incremental early exercises extracted from Khan-Magomedov's research; see Anna Bokov, (2020), *op. cit.*, pp. 376-383.
[10] Nikolai Alexandrovich Ladovskii, Izvestiia ASNOVA, *Osnovy postroenija teorii arhitektury* (Foundations for building a theory of architecture) Proceedings of the Association of New Architects. Moscow, p. 3, 1926. Translated by author Russian original: 1) геометрических — отношения сторон, ребер, углов, характер поверхностей и т. д. 2) физических—весомость, плотность, массу, и т. д. 3; физико-механических—устойчивость, подвижность, 4) логических—выразительности поверхности как таковой и ограничивающей об'ем В зависимости от выразительности величины и количества мы можем говорить о: а) мощиислабости , б) величииинизменности , в) конечностиибезковечноти.
[11] Anatole Senkevitch, Jr, *Aspects of Spatial Form and Perceptual Psychology in the Doctrine of the Rationalist Movement in Soviet Architecture in the 1920's*.via, n6, p. 102, 1983.

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EDUCATIONAL VALUES OF DESIGN BRIEFS BASED ON CULTURE-LED REGENERATION PROJECTS: CASE STUDY IN HUDDERSFIELD

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INTRODUCTION

This paper describes and reflects upon the educational values of design briefs based on culture-led regeneration projects. It draws upon a series of successful design exercises that asked architecture students to design new structures and buildings in and around the town of Huddersfield in England, representing the case study for this paper.

Design-based modules constitute the central core of architecture and interior design disciplines. The design studio environment where students develop their projects is very similar to those found in architectural practices and similar offices. In this environment, students learn the required design skills through a series of projects of varying scale and complexity, which allow them to explore the design process from different points of view.

The teaching of design-based disciplines differs from that of many other fields. In architecture and interior design, one of the most critical skills to be developed is creativity. In Bloom's revised taxonomy of Learning Domains,[1] Creating is at the top of the list of higher-order thinking skills, followed by Evaluating, Analysing, Applying, Understanding and Remembering. Teaching the complex and multifaceted aspects of design requires a variety of teaching and learning strategies, including constructivist learning theory, experiential learning and project-based learning. The constructivist learning theory[2] is based on the idea of learners as active participants in the process of constructing knowledge. Students always play an active role in design disciplines because they develop critical thinking skills by being asked to design something. Experiential learning[3] emphasises the importance of learning through experience and reflecting while working, while project-based learning exposes students to specific real-world themes, challenges and locations.

A typical educational design process includes several stages that lead students to a final design proposal. The first step is the introduction of a specific design brief which includes information related to the theme, the building type(s) and its design requirements, and the main aims/learning outcomes. Moreover, this brief also usually introduces the site, the client(s) and the users. During the first and second years, students are usually assigned to a particular theme, building type and site. However, towards the end of their studies, they might receive briefs which are more open and which allow them to complete part of the document themselves. For example, they might be able to select a site, a client and the building type. However, these personal choices are still required to address a chosen theme proposed by the tutor.

The brief constitutes one of the essential elements of any design project. Sometimes, the brief may focus on one particular stage, or a few stages, of the design process. The project site could be a real location, a location inspired by a real place (even located on another planet), or an entirely imaginary place (which might also be inspired by fictional sites from literature, movies or cartoons). The briefs analysed in this paper invite students to explore real locations, relevant artistic and cultural themes, and the relationships of these to society and some of its current challenges.

CONTEMPORARY SOCIETAL CHALLENGES, THE ROLE OF CULTURE AND THE DESIGN BRIEFS

The whole world is currently facing numerous challenges, some of which are summarised on the Global Issues page of the United Nations website.[4] Scarcity of resources, including food and water, climate change, overpopulation and biodiversity loss represent just a few of these pressing challenges. Various international organisations continuously collect and analyse data on some of these problems, and develop and publish reports and other forms of documentation to raise awareness and support people's decisions at every level, from laypeople to decision and policy makers. Among these organisations, the WWF presents a knowledge hub on its website, from which it is possible to download several reports.[5] Another organisation is the already-mentioned United Nations, which shares a webpage with a proposed list of "17 Goals to Transform Our World."[6] Culture and education can positively impact all 17 of the sustainable development goals described by the United Nations, because they can influence people's way of thinking and hence their behaviours and lifestyles.

Having recognised the role of art and culture in improving society's challenges, some of the design briefs developed and adopted in the first year of the BA Architecture asked students to design a selection of structures and buildings that could host artistic, cultural and educational activities. These themes are relevant for students from very diverse cultural, social, geographical and economic backgrounds. The interest of new generations in current societal challenges is also mentioned in the publication "Millennials in Architecture."[7]

VALUE OF CULTURE-LED REGENERATION PROJECTS

Many cities worldwide have witnessed (or are witnessing) a period of economic and social decline due to various factors. Around Europe, for example, there are many cities which, after a period of rapid growth and related wealth thanks to their industrial production, have subsequently witnessed a considerable decline. In many of these cities, local authorities have launched urban regeneration projects which are very often culture-driven. As the name suggests, these initiatives are culture-led and have taken different forms, and all over the world it is possible to see projects that have had a positive impact on the regeneration of their town or cities. The European City of Culture and the UK City of Culture are examples of relevant and successful culture-led initiatives.[8] As mentioned in the report "Culture-led Regeneration: Achieving Inclusive and Sustainable Growth," published by the Local Government Association, the impact of these culture-led projects can range from "growth in tourism, creative and cultural sectors, to enhancing individual skills, knowledge and confidence, to strengthening community pride and place image."[9] Architecture and interior design can play an essential role in such culture-led regeneration projects. One internationally well-known and successful project is the Guggenheim Museum in Bilbao, Spain. This museum was designed by the internationally acclaimed American-Canadian architect Frank Gehry, and it opened in 1997. Since then, the city has seen an increasing number of tourists and a notable improvement in its image and attractiveness.[10] The impact of the new, iconic museum has been so significant that it has generated the expression "the Bilbao effect," which refers to the design of iconic architecture by a renowned international architect to transform an impoverished city into a desirable place for its inhabitants, and an attractive destination for tourists and people/companies working in the cultural and creative

industries (CCI). Several other European cities, including Lens, Metz, Essen and Istanbul, have tried to replicate the "Bilbao effect."[11] In the United Kingdom, it is possible to find similar examples, including Wakefield and Dundee.

The word culture can be interpreted in several ways. In the context of this research, this word is applied according to the definition included in the Online Oxford Dictionary "Lexico," namely, "The arts and other manifestations of human intellectual achievement regarded collectively."[12]

HUDDERSFIELD CASE STUDY

Huddersfield is a town located in West Yorkshire (England) and, like many towns and cities around the world, it has experienced a period of wealth, especially during the industrial revolution. Around the town, it is still possible to see buildings and other traces of its glorious industrial past, including mills, factories, canals and bridges. Like many other industrial towns and cities, Huddersfield has more recently experienced a decline, followed by some cultural, economic and social challenges. Several streets in the town centre feature empty shops, plots and buildings, a phenomenon shared by other places with a similar industrial past.

However, the town also has several positive points supporting its potential regeneration. The town centre is compact, walkable and enriched by some remarkable Victorian architecture[13] (Figure 1 - Left). Its topography and beautiful surrounding natural landscape of green hills (Figure 1 - Right) offer a variety of spatial situations and exciting views. Moreover, Huddersfield is a university town with local institutions keen to revitalise its town centre through ambitious plans.

Figure 1. (Left) Example of Huddersfield's remarkable Victorian architecture located in the town centre; (Right) View of the beautiful natural landscape of green hills that surrounds the town (images source: authors' personal archive)

Ongoing activities and future visions connected to art, culture and regeneration

At the moment, there are several ongoing initiatives aimed at regenerating the town through cultural interventions. In 2019, the town council published the "Huddersfield Blueprint," with the aim of redeveloping a selection of key areas to create a "thriving, modern-day town centre."[14] One of these areas is the new "cultural heart," which has been defined as "the most iconic vision within The Blueprint."[15]

The authors of the current paper are also developing a project entitled "(Re)Imagining Huddersfield's Narratives through Culture-Led Regeneration Projects," which is being presented (through various activities, a seminar, a presentation, a workshop and a public exhibition) as part of "Cultures of Place," another initiative led by academics from the University of Huddersfield's School of Arts and Humanities.

Since 2017, BA Architecture students have been exploring design projects connected by the common thread of art and culture in and around Huddersfield. Some of the projects have included a visitor centre, a bookshop cafeteria with gallery space, a museum, a pavilion and pods. All are culture-led regeneration projects, but they differ in scale and complexity.

Design briefs explored so far and their key elements

As part of this cultural strand, during the first term of their BA Architecture, students have designed two small structures, a pod and a pavilion. The Culture Pod project (Figure 2) asked students to design a small pod to be located in the pedestrian area of New Street, one of the main streets in the town centre. The pod had to showcase an 'arts' activity in Huddersfield. The main aim of this structure was to both 'represent' and 'accommodate' aspects of one (or more) arts-related cultural event(s) or product(s) from Huddersfield and its surrounding areas (including the university). The pod should be used to advertise events and exhibit small objects, and should also function as a ticket office for events linked to its related artistic area.

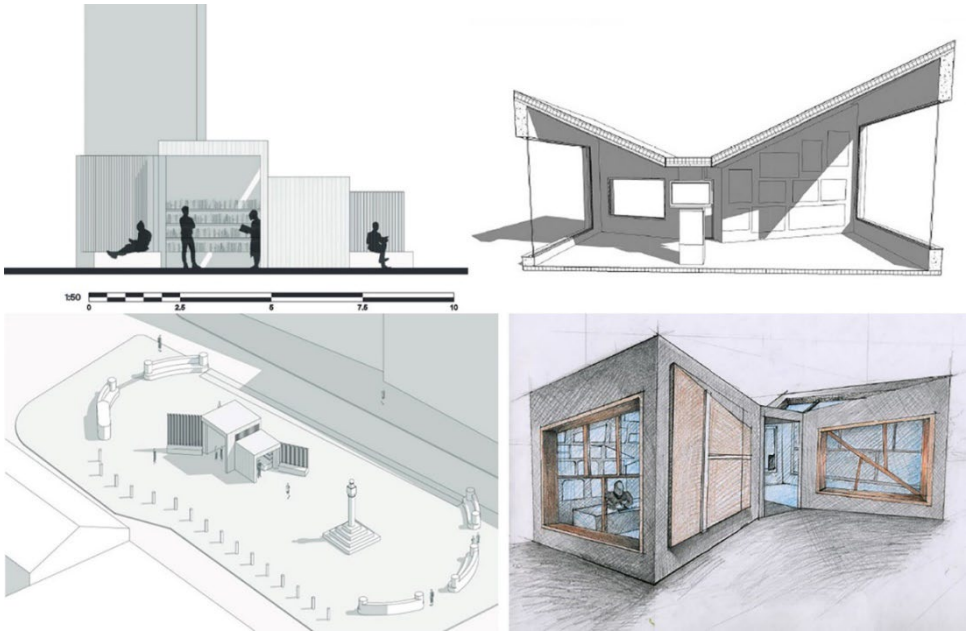

Figure 2. Examples of Culture Pods designed by students: (Left) Elevation and 3D view by student William Gower; (Right) Perspective views by student Afzal Rana (images source: final portfolios submitted by students)

For the Culture Pavilion project, students had to design a small pavilion in Greenhead Park, an English Heritage Grade II listed property designed and built during the Victorian era.[16] Students were free to select, within the park, any location for their pavilion (Figure 3).

Figure 3. Two photos showing the variety of locations within Greenhead Park, Huddersfield (images source: authors' personal archive)

This small structure could host an event or activities linked to the theme of their Culture Pod (so that the two designs would complement each other). However, students were also allowed to select a

different 'theme' (art or cultural event) from the one they chose for the Culture Pod. The pavilion (Figure 4) also had to include a flexible space that could be used for various cultural activities linked to the selected art form, such as small-scale performances, exhibitions or presentations.

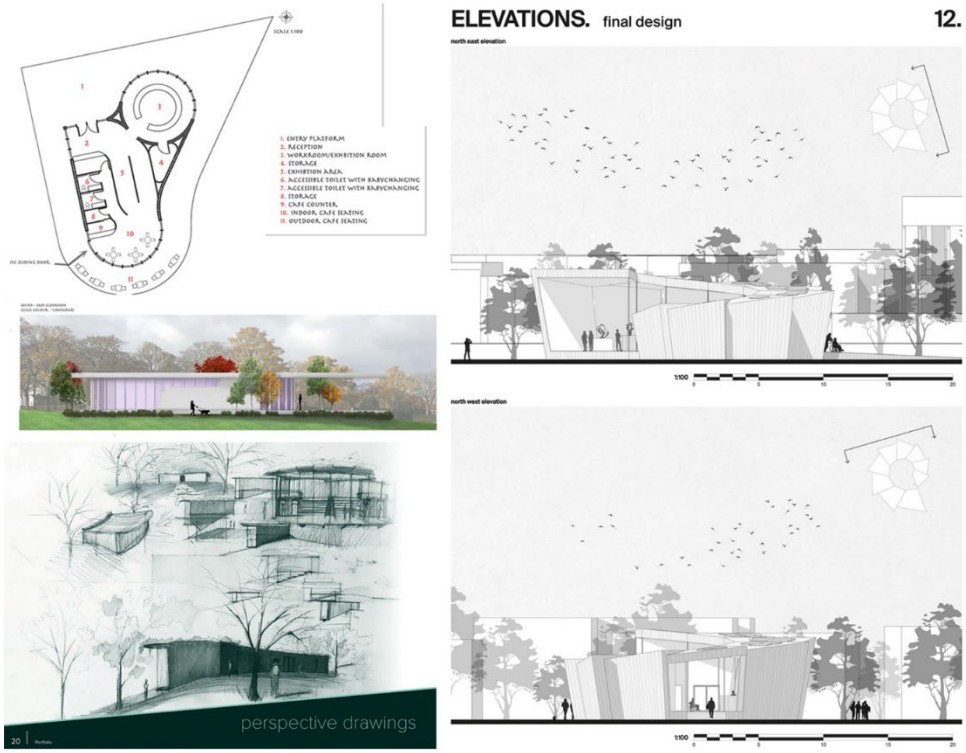

Figure 4. Examples of Culture Pavilions designed by students. (Top left) Plan view and elevation by student Julia Rondinone; (Bottom left) Freehand perspective drawings by student Michal Luszpinski; (Right) Elevations by student William Gower (images source: final portfolios submitted by students)

The Video Games Art Museum [17] (Figure 5) was one of the major projects proposed for two consecutive years during the second term. Video games have the potential to trigger economic and cultural changes, and a Museum of Video Games Art located in the centre of Huddersfield could contribute positively to both economic and cultural aspects of the town. The two sites (one per year) selected for this design exercise were an empty backyard used partially as a car park, and a public parking area next to the new "cultural heart." The museum should present exhibitions about the design process behind video games. Hence, it should feature spaces to showcase a broad range of items, including posters, production notebooks, artworks, screens and interactive installations. A further idea behind the building was to foster dialogues and exchanges of ideas around both a contemporary art form (video games) that uses innovative digital technologies, and the town of Huddersfield.

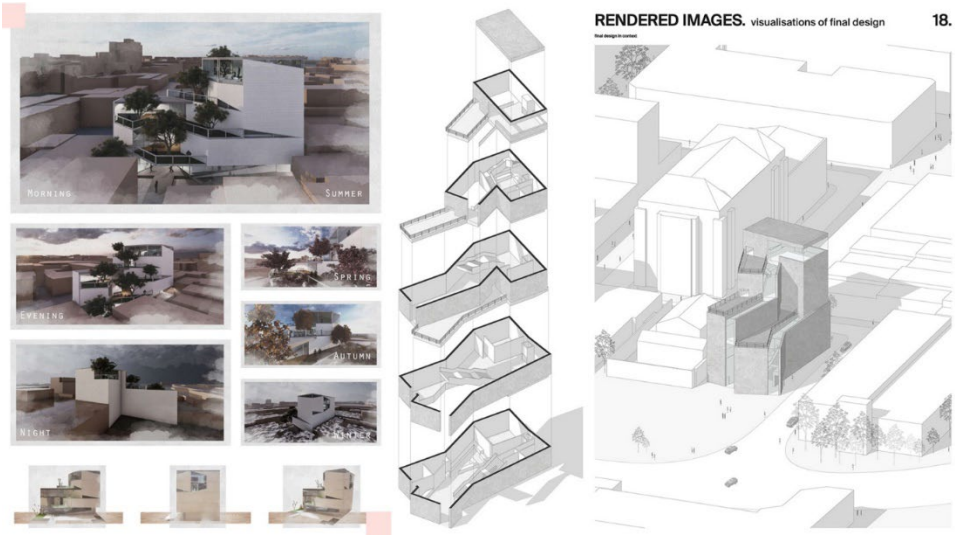

Figure 5. Examples of Video Games Art Museums designed by students: (Left) Rendered views by student Fidelia Florentia; (Centre and Right) Rendered views by student William Gower (images source: final portfolios submitted by students)

In the last two years, students have also explored the design of a Bookshop Cafeteria with Gallery Space, to be used for various activities including exhibitions, presentations and readings. The site for this building was located close to the campus, next to an important road (Firth Street), a pedestrian footbridge and the River Colne (Figure 6 - Left). The site also has relevant historical value represented by the presence of industrial architectural heritage repurposed for new functions (Figure 6 - Right).

Figure 6. Contextual elements of the site selected for the Bookshop Cafeteria with Gallery Space: (Left) View of part of the site and the River Colne; (Right) view of the site and the industrial architectural heritage repurposed for new functions including university buildings (images source: authors' personal archive)

The Bookshop Cafeteria would allow the merging of cultural and social life in a relaxing environment next to a beautiful natural setting that is worth (re)discovering (Figure 7).

Figure 7. Examples of Bookshop Cafeterias with Gallery Spaces: (Left) Plan view by student Lucy Gregson; (Right) Rendered images by Madiha Hussain (images source: final portfolios submitted by students)

Each project brief contains information related to various aspects of the design requirements, encompassing functions, spaces, site, technologies, materials and other project-specific considerations. The initiatives for development of the briefs came from multiple sources. Sometimes, a site triggered ideas for specific projects, while in other cases, the starting point was the idea of exploring the benefits of an artistic or cultural theme relevant to the town and its inhabitants. The main criteria that have informed the development of the briefs have been related to the key elements, in terms of theme, site and building type, which have been adopted so far.

EDUCATIONAL VALUES OF DESIGN BRIEFS BASED ON CULTURE-LED REGENERATION PROJECTS

This section identifies and describes a selection of key aspects and values of the design brief based on culture-led regeneration projects. Firstly, students had the opportunity to reflect on different artistic and cultural themes and expressions and their possible benefit to the town and people's lives. For the Culture Pod, students had to select an art form, cultural event or product which the pod had to showcase. The brief included a list of suggestions:

- The Visual Arts (architecture, ceramics, conceptual art, drawing, painting, photography, sculpture, motion pictures...);
- The Literary Arts (prose, drama, poetry...);
- The Performing Arts (music, theatre, dance, opera...);
- Video Games.

For the Culture Pavilion, they also had the possibility of selecting one of the above art forms. The themes of these first two briefs allowed students to select and conduct research on one of their favourite art forms, or to discover and develop a passion for an art that they had never previously explored. The information they gathered on cultural events in and around Huddersfield also allowed them to discover the town's cultural offering. One of the ideas behind the freedom to select their preferred art, rather than proposing one single option, was to be more inclusive and recognise that each student is different and has different cultural interests and background. This has been a

successful approach to introducing students to architecture, especially for a first-year and first-term project.

The Video Games Art Museum project exposed students to a new contemporary art form. They learnt how narrative, experience and interaction are intertwined within the virtual environments of video games. These games can also represent a valuable source of inspiration for architectural design and representation. Furthermore, the students noticed how specific video games deliver meaningful information through interactive experiences. Many students are already familiar with video games which they play during their free time. However, the focus on video games art provides them with an artistic and cultural dimension and depth that are not usually considered if they are only using video games as a hobby.

The idea behind the Bookshop Cafeteria with Gallery Space was developed during the Covid19 pandemic. During the pandemic, the lockdown and related restrictions constrained many people to spend most of their time at home for several months. This situation encouraged individuals to discover or rediscover some passions, including reading. The value of reading is well-known, and in today's world, where things are continually changing at a fast speed, it is even more important as an activity that encourages slowness and reflection and feeds the imagination. Hence, this project exposed students to reading and books, an activity and objects which were further explored through a mind-mapping exercise organised in collaboration with the university library. Students developed some interesting reflections that were shared with the whole classroom.

For all the projects, students had the opportunity to discover and explore different parts of the town, and to elaborate on reflections regarding how those sites could be transformed through the addition of new architectural interventions and specific culture-based activities. All the chosen sites were selected because of their particular features and variety of contextual elements. Walking was used as a tool to analyse, explore and identify sites with potential characteristics that could trigger intriguing design reflections and interventions. Students could also envision the new narratives/lifestyles that might be triggered by these new architectural and cultural projects. In addition, the site visits allowed them to appreciate aspects and areas of the town that they did not know. For example, part of the backyard used as one of the sites for the Video Games Art Museum seems to have been the result of demolition. The practice of using this kind of empty site for new buildings is defined as urban infill (or densification), and is considered a sustainable form of land development. Moreover, the projects asked them to establish a dialogue with the context, including the natural environments of Greenhead Park and the River Colne. Hence, each project exposed students to ideas and triggered reflections that were not limited to the architectural characteristics of the structure or object they had to design.

CONCLUSION

This paper has described and reflected upon the educational value of design briefs based on culture-led regeneration projects. It has drawn upon a series of successful design exercises that asked first-year architecture students to design new structures and buildings in and around the town of Huddersfield (England). The writing has demonstrated how design briefs based on culture-led regeneration projects can provide educational value on multiple levels for students of architecture or interior design disciplines. For example, the students were able to understand the possibility of interpreting art, culture and culture-led interventions in numerous ways, and to see how a network of different cultural venues distributed around the town could create a better environment and provide new lifestyles for inhabitants.

This paper presents part of an ongoing research study that will be further expanded with the project entitled "(Re)Imagining Huddersfield's Narratives through Culture-Led Regeneration Projects," as well as further research and teaching activities that will investigate additional artistic, cultural and educational aspects of projects in architecture and interior design. Specific building types (including

both temporary and permanent structures) connected to artistic and cultural themes could trigger new interests for local people and attract new audiences from other places. Some further possible sites (and new themes) for new design briefs have already been identified, including further backyards, infill spaces and interior spaces (historical arcades).

ACKNOWLEDGMENTS

The authors wish to thank the first-year BA Architecture students at the University of Huddersfield (academic years 2018-2022) who actively participated in on-campus and online tutorials (during the COVID-19 pandemic) and produced high-quality work. Danilo would also like to thank the tutors who have supported the design studio activities during the last five years. For the Bookshop Cafeteria project, grateful thanks are also due to the owners of the Read Bookshop based in Holmfirth (https://to-be-read.co.uk/), James and Louise, who kindly agreed to act as fictional clients for BA Architecture students and delivered interesting presentations on their bookshop and work.

NOTES

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THE IMPACT OF THINKING FAST AND SLOW ON TEACHING AND LEARNING STRATEGIES IN MATHEMATICS

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INTRODUCTION

Mathematics at university level can be challenging: students are introduced to statements, proofs, and a variety of methodologies that are unfamiliar. The extent to which students engage with such topics greatly moulds their abilities and progress along their learning journey. Instructional strategies for teaching mathematics at university require a variety of approaches since students' abilities, thought process, motivations and personalities differ. Knowing more about how the mathematical mindset works, particularly at the stage of undergraduate students, allows the educator to come up with effective ways to communicate the theory as well as guide the student to develop a successful learning style. The goal of mathematics educators at university level is to teach students how to tackle knowledge with competence and experience in steering, and not (only) to deposit facts and taught procedures in their memory bank.

Daniel Kahneman's celebrated book *Thinking Fast and Slow*[1], describes *System 1* (fast thinking) and *System 2* (slow thinking) processes and discusses their roles in understanding socio-economic interaction and decision making. Kahneman makes the case that presence of these two cognitive systems influences everything we do, including how we make decisions, and how we learn. In the past decade, and especially since the COVID-19 pandemic, there has been a rise in innovative digital approaches to education to engage students in creativity and collaborative ways. Although this may be an enriching way to motivate and teach students mathematics, a gap remains around helping students to train their strategic and disciplined thinking skills. Training a student to become a strategic thinker (capable of solving a problem or proving a theorem) does not happen instinctively but happens knowingly and intentionally. The benefit of thinking in such a way has benefits, as it becomes continual, and one is doing it consciously, thus developing a long-term skill.

There is a clear belief in the education literature on the growth mindset that student abilities to grasp mathematical concepts can be developed achievement.[2] There are a variety of positive behavioural and academic outcomes associated with such a belief which can be developed by interventions in teaching, assessment, and learning strategies. However, what do those interventions look like and why might they work? Based on Systems 1 and 2, as outlined in Daniel Kahneman's book *Thinking, Fast and Slow*, this paper explores how, and to what extent, the mathematical mindset of undergraduate students may be shaped by a layering of slow and fast cognitive processes. When are the two systems used in learning new mathematical concepts, and when using what they already know in the process? And how does the use of these systems influence problem solving, students' thoughts and their ability

to progress? This paper aims to use these questions to develop a rationale behind teaching strategies that reflect these insights and to discuss some limitations and difficulties that may arise while using such strategies.

AN OVERVIEW OF SYSTEM 1 AND SYSTEM 2

Kahneman's book made popular the idea that decision making in events occurring in our everyday lives can be seen as using two cognitive systems, which he termed System 1 and System 2. [3]

- *System 1* corresponds to a fast, automatic, and decisive thought process. This process does not actively require logical or rational thinking and relies on heuristics, instinctive and learned behaviour. Making decisions while in System 1 is easy and quick, but can be subject to quite severe biases, especially when untrained, as it typically makes a decision based on a small amount of available information. However, when well-trained, System 1 can produce a skilful but automatic response.
- *System 2* corresponds to slow and considered, rational cognitive thought processes. Such processes are effort-full, language-based and error-prone: they require search of memory for previously deposited facts and careful resolution of paradoxical information that often results in cognitive dissonance. For these reasons, System 2 is slow to come to conclusions and tends to be used in fairly limited circumstances in everyday life. However, it is a vital skill to develop for mathematical problem solving.

Note that these systems are more than simply *slow* and *fast*. They can broadly be thought of as independent agents, each with abilities, limitations, functions, and assumptions.[4] Kahneman and his collaborators' research has done much to clarify these limitations, especially in the area of socio-economic decision making. The systems correspond to the *dual-process model of cognition*[5] whereby System 1 is the automatic (unconscious) mode and System 2 is the deliberate (analytical) mode. In this model, decision making works as the two Systems independently, and often in parallel, try to reach a conclusion. Particular problems that might arise using System 1 thinking include anchoring, the availability trap, loss aversion, framing, and the sunk loss fallacy. One might say that one of the main aims of mathematical training is to develop and extend the ability for applying System 2 thinking in a wide range of problems, but we suggest it is more complex than this. In this paper we highlight particular effects associated with this approach can be used to understand problems and fallacies that may occur when attempting to teach or learn a new mathematical topic.

MAPPING SYSTEMS 1 AND 2 ONTO LEARNING MATHEMATICS IN HE

When approaching a mathematical problem, such as solving a differential equation or proving a theorem, there is usually a desire to reach the outcome. The use of System 1 is rapid and instinctive but will tend to use heuristics to come to a conclusion;[6] if these heuristics are not well adapted to the situation, this may result in failure to provide a valid solution. On the other hand, the effortful and slow nature of System 2 can lead to demotivation and abandonment of the problem. This is particularly the case if the student is not familiar with bringing an extended use of System 2 to a successful conclusion.

Implications for Problem Solving

When attempting an unseen problem, a student may have difficulties in decoding a question, comprehending what is being asked, sorting relevant and essential information from the extraneous parts, recalling, or deriving a method to solve the problem, working through each step, and knowing what calculations are relevant. How do we problem solve? There have been many models in literature on the stages of problem solving. One model involves the "four steps":[7] understanding and exploring the problem; devising a plan; carrying out the plan; reflecting on the solution. Having steps to follow

allows students to construct their own knowledge within the steps and gives them agency to collaborate actively on the problem.[8]

Frequently, some problems require students to move back and forth and across these steps. *Loss aversion* within System 1 can prevent students from making the right decisions, particularly when solving complex problems or when reaching a difficult stage within the problem-solving steps. The *sunk loss fallacy* is a similar problem - if a student has invested time in effort into a particular method that may not be appropriate, they may persist instead of switching to another more appropriate method. Both of these may cause students to disengage with a new mathematical approach and seek a way around solving the problem using methods they are used to.

Students can also switch back and forth between intuitive (System 1), deliberate, analytic (System 2) approaches during problem solving depending on their state of mind, progress within the problem and input from the educator. Encouraging students devote time and effort to System 2 can lead to "A-ha" moments[9] where knowledge gets successfully embedded into the student's skilful System 1, after which becomes accessible without the need for conscious processing.[10]

The effectiveness of a teaching approach is enhanced when its design and aims are aligned with the six levels of Bloom's Taxonomy[11]. Bloom's Taxonomy is a well-known tool used by many educators to classify learning objectives and is built on the cognitive domain that assumes that learning should start from the basics and progress towards higher level concepts using six level as shown in Figure 1. We suggest that motivational and integrational skills require extensive use of System 1, while intermediate levels require extensive use of System 2.

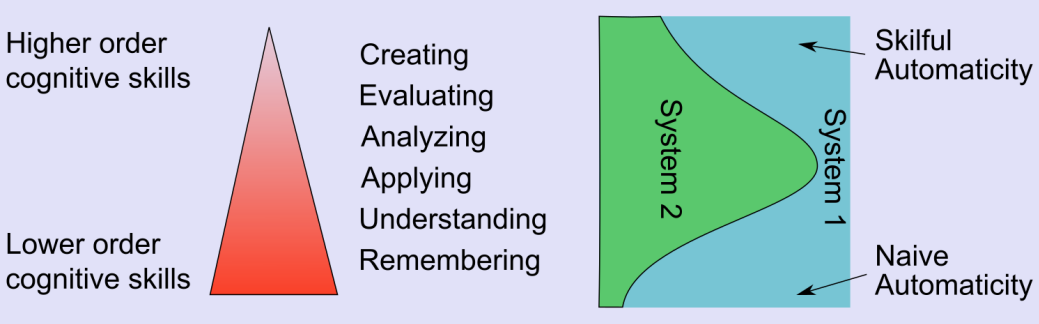

Figure 3. The role of System 1 (fast) and System 2 (slow) thinking within Bloom's Taxonomy. From lower to higher level thinking skills (i) remembering: memorization and recollection of facts without needing to understand; (ii) understanding: having deeper knowledge of the topic; (iii) applying: using what we know in solving and implementation; (iv) analyzing: this involves examining and breaking down information into smaller components, then determining how the parts relate to each other; (v) evaluating: this involves analyzing while critiquing and comparing; and (VI) creating; generalizing and extending the end result. We suggest that System 2 needs to become most active at the intermediate levels of the taxonomy.

We suggest that a common problem for students arises from the temptation to use System 1 excessively at intermediate levels of the taxonomy. It is essential to help students activate their System 2 thinking, via slow and careful exposition of topics such as mathematical logic: this gives students confidence that a cognitive excursion into System 2 is likely to be worthwhile by giving comprehensible building blocks and a likely outcome when faced with an unseen concept or problem.

The temptation for students seeing a problem for the first time is to jump from an initial understanding straight to problem solving in the hope of gaining a reward. The problem posed by this temptation is that it springs over the necessary use of System 2 shown in the intermediate level of the taxonomy in Figure 1. This can be aggrevated by a knowledgable (but impatient) instructor who fails to highlight necessary System 2 involvement and who may have forgotten the importance of this involvement

when learning this for the first time. Only through the involvement of System 2 in the solution to the problem leads to an approach that then becomes a reliable part of their System 1,[12] and after which the student requires reduced need for the effortful System 2 intervention with that particular approach.[13]

Implications for Reasoning

System 2 allows the mind to carefully identify benefits and drawbacks of using a particular approach. One way to influence the use of analogical reasoning and critical thinking is to set the problem to be solved in a way that compares two separate approaches with one leading to the wrong answer or conclusion and the other leading to the correct one. This may be particularly useful if the incorrect method highlights a common (but problematic) System 1 heuristic. When learning a new algorithm, it is useful to split the algorithm into distinct parts and to spend time with the parts in a sequential yet thorough manner. This allows the students to exercise their decompositional reasoning.[14] When doing this, it is important to slow down with the explanation when it comes to a more abstract, or unseen concept.

Occasionally, students fall into the *availability trap* whereby they apply an incorrect approach simply because they know how to apply it and believe it is somewhat relevant to the question. This can often take place even before the question is well understood. A useful exercise is to ask students to reflect and write down why the method they used is not applicable, rather than discarding it. This reflection helps them think more clearly about the goal of a problem and what *other* approaches are available to them and so stimulating System 2 deliberations. One way to deepen understanding of a theorem is to ask students to explain which hypotheses are broken in cases where the conclusion of a theorem does not hold.

How can we use *framing* to make an approach more appealing and convincing? Before introducing a new formal definition, start off by saying it using words only, and then explain the meaning behind that statement, again using words and images if possible. After the students have a good understanding of that definition, then they are ready to see the formal definition in terms of the mathematical notation and to launch into System 2 processes. It can be occasionally difficult to use various approaches to framing a mathematics statement, particularly in abstract maths, however speaking about its use or derivation (using words and images) to accompany the statement makes it easier to understand and removes the monotony of formal definition writing.

Implications for Student Engagement

One major challenge for the mathematics educator is to maintain student engagement across a range of backgrounds and expectations within a class. System 2 thinking is effortful and laborious, and as it does not lend itself to (lecture) theatrics or PowerPoint presentations, there is a temptation for the educator to leave it to students' independent study. This is especially the case in a cohort of students with mixed experiences in engaging System 2 to solve novel problems[15]. An experienced and successful student becomes used to the need to engage System 2 and to delay judgement on its outcome, in the knowledge that the effort is likely to be worthwhile. However, it can easily become a source of frustration and disillusionment, if attempts to use System 2 thinking to solve a problem are not successful even for "easier" material. This may be compounded by more experienced tutor or peers who may have learned advanced and accurate heuristics and who are able to solve a problem using predominantly System 1 thinking. In such a case it is important to devise strategies that ensure students value, and have access to, detailed (possibly pedestrian) System 2 arguments. If a learner "gives up" investing time in System 2 they may prioritise System 1 heuristics to get them through the assessment. In the worst case they may lose engagement with the learning altogether.

Implications for Assessment

Mathematics is a lot about ideas and processes, but this internalizes when students attempt examples and try to engage more deeply. A variety of assessments can make a difference, as does positive feedback, listening to different approaches to the questions, and having more open-ended questions, set yourself a question as a student and do it that way.

The concept of *loss aversion* certainly plays a key role in the students' approach to revision and assessments. Most students start with an aspiration to achieve high marks in their exams and course as a whole. As soon as the pace of the course speeds up and they settle in into university life, students start to have to prioritise their activities and set their own personal objectives. For some students, this is getting a first-class mark, for others it is simply passing each module. By focusing too much on certain objectives, students may miss the fundamental point that learning and training the mind for future (harder) topics takes more than just doing what is required to get a first-class mark or a pass. It requires slowing down with learning new concepts and training the high-level cognitive processes. Studies show that when students set their goal on learning rather than on achieving high marks, their problem solving skills and reasoning skills are enhanced considerably.[16]

Spending time on System 2 may feel risky for a student worried about gaining marks in exams. However, this has a long-term impact on their learning strategies. To that end, we argue that assessment should be designed in a way that approaches using System 1 (e.g. presenting comparable questions) is not enough. Assessment problems should be designed in a way that makes the revision of the topics deep and thorough, and that ensures System 2 is activated during the learning process. The paradox here is that assessing the outcomes using time limited examinations strongly incentivizes use of System 1 heuristics that are only likely to be reliable if they have been developed with the benefit of System 2! We suggest it is useful to consider which processes are engaged during assessment of an intended learning outcomes, and whether this is optimal. Overall, assessments should help students gain confidence that they can successfully engage System 2 thinking as and when needed. In addition to demonstrating and understanding of the basics of the topic, more challenging questions that require a slower thinking approach and a combination of concepts and theories are good ways to do this.

CONCLUSION

Learning mathematics requires the constructive use of both System 1, the fast, automatic (but heuristic and prone to bias) approach, as well as System 2, the slow, rational, language-based (but effortful and error-prone) approach. When teaching a new topic, a slow approach is a way to signal the need for System 2 thinking, however it is also important to recognize that as understanding of a topic matures, a System 2 technique may be transferred into skillful System 1 heuristics.

Going through the steps of problem solving in the slow manner of System 2 heavily relies on students identifying relevant details in problems, having the skill to identify what is irrelevant and what the meaning of each part is. With practice and time, repeated System 2 use on similar problems can create new, additional, skills for their System 1 thinking, thus giving them more areas of experiencing satisfaction that comes from success in solving problems.

It is important to make students aware of the variety of learning techniques, making sure they have some level of freedom in what and how they study. The assessments shouldn’t be too rigid, too much or too little, also neither too hard nor too easy. And encourage students to experiment and have an open mind. Students who have cultivated a growth mindset are less likely to be demotivated by failing an assessment or by not quickly grasping the theory. On the other hand, they are more likely to put in more effort and try out various approaches to bridge the gaps and identify ways to succeed the next time. Ideally, students will use their losses and failures to learn how to use System 1 and 2 appropriately to gain and succeed in future.

NOTES

[1] Daniel Kahneman, *Thinking Fast and Slow*, Penguin, (1st edition 2012).
[2] Jo Boaler, "Ability and Mathematics", Forum, (2013) 55(1) pp. 143–152.
[3] We stick primarily to Kahneman's terminology in this paper, though note that System 1 corresponds to automaticity and System 2 to cognitive rational responses. See for example a discussion of the effects of automaticity on the pedagogical process, Feldon, D.F., Cognitive Load and Classroom Teaching: The Double-Edged Sword of Automaticity, (Educational Psychologist 2007), 42(3), pp. 123–137.
[4] Daniel Kahneman, *Thinking Fast and Slow*, Penguin, (1st edition 2012).
[5] David Feldon, "Cognitive Load and Classroom Teaching: The Double-Edged Sword of Automaticity", Educational Psychologist (2007), 42(3), pp. 123–137.
[6] Daniel Kahneman, *Thinking Fast and Slow*, Penguin, (1st edition 2012).
[7] Jason van Steenburgh, et al. "Insight In The Oxford Handbook of Thinking and Reasoning", ed. K Holyoak, R Morrison, New York: Oxford Univ. Press (2012), pp. 475–91.
[8] George Polya, *How to solve it, a new aspect of mathematical methods*, Stanford University Press (Doubleday Anchor Books, 1957).
[9] John Kounis and Mark Beeman, "The Aha! Moment: The Cognitive Neuroscience of Insight", Current Directions in Psychological Science, Sage Journals, (2009), 18(4) pp. 210-216.
[10] Brian Bottge, et al. "Impact of enhanced anchored instruction in inclusive math classrooms", Exceptional Children (2015) 81(2), pp. 158-175.
[11] Benjamin Samuel Bloom, *Taxonomy of educational objectives: The classification of educational goals: Handbook I, cognitive domain*, New York: Toronto, Longmans, Green, (1956).
[12] Daniel Kahneman, *Thinking Fast and Slow*, Penguin, (1st edition 2012).
[13] Richard Clark and David Feldon, "Five Common but Questionable Principles of Multimedia Learning", Cambridge Handbooks in Psychology, Cambridge University Press, (2012) pp. 97-116.
[14] Jason van Steenburgh, et al. "Insight In The Oxford Handbook of Thinking and Reasoning", ed. K Holyoak, R Morrison, New York: Oxford Univ. Press (2012), pp. 475–91.
[15] Linda Darling-Hammond and Jon Snyder, Authentic Assessment of Teaching in Context, Teaching and Teacher Education, (2000), 16(5-6) pp. 523-545.
[16] John Sweller, "Cognitive technology: Some procedures for facilitating learning and problem solving in mathematics and science", Journal of Educational Psychology (1989) 81(4), 457–466.

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EMPLACING ARCHITECTURAL EDUCATION IN A SOCIOPHYSICAL TERRITORY

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INTRODUCTION

Placemaking can contribute to create learning places that are integrated into the community, rather than confined to the classroom. Moreover, the combination of placemaking with artistic practices offers an opportunity to integrate educational activities into the cultural, social and physical milieu. In the collaborative reflective processes which placemaking conveys, artists and educational staff, students and residents all become knowledge providers through learning processes embedded in a sociophysical territory.

One of the purposes of the A-Place project "Linking places through networked artistic practices",[1] co-funded by the Creative Europe 2019-2023 programme, is to create transversal learning spaces with placemaking activities that link artistic practices with educational programmes at different levels, from high school to higher education. Since October 2019, we have been carrying out in L'Hospitalet de Llobregat, a city which is part of the metropolitan area of Barcelona, Spain, a comprehensive programme of learning activities integrated in the community. The purpose of these activities was to involve students and staff from university and high schools, artists and neighbours, in a common reflection on the sense of place and the collective identity. The activities included mapping of the sociophysical territory carried out onsite –pedagogic activities in public spaces and public facilities, urban walks with neighbours representing diverse social groups– and online –with digital maps and through social media–, and joint teaching and learning activities with high-school pupils and architecture students to identify meanings associated to places and represent them with texts, images, videos and installations in public spaces.

Creating places and designing spaces

The idea of place –in opposition to the concept of space– implies the existence of bonds between people and the environment they inhabit. Place is commonly referred to as space with meaning, as a "field or care" as Tuan described it.[2] For Sime "The term 'place', as opposed to space, implies a strong emotional tie, temporary or more long-lasting, between a person and a particular physical location".[3] Place is then opposed to abstract, geometric space. Unlike a space considered as a blank slate or empty container, a place is never empty. As Relph argued, places are "centres of meaning, or focuses of intention and purpose",[4] meanings and functions which are not the same for all individuals or groups.

People use public spaces, although they live in places; they create places by endowing spaces with value. However, architects have been often criticized for being more concerned with designing spaces

than with creating places, with the formal and material characteristics of the spaces than with the people who will live in them; in short, more with abstract space than with lived space. As early as the 1970s, Tuan called on design professionals not to reduce the complexity of being-in-the-world to simple abstractions,[5] a person into a component of a functional mechanism, either the building or the city. Rather, he appealed to planners and designers to expand their discourses in order to bridge the gap between the abstract world of design and the world of experience.[6] This dilemma between abstract space and lived space was also echoed in by Norberg-Schulz's *Genius loci.*[7] However, there are still discussions on how to overcome this dilemma in professional practice and education. Tonkiss, for instance, contends that cities are "material realities which also take their shape in memory and perception"[8] and for Yaneva social and physical structures are indivisible elements of a unique construction process: "We should question the assumption that casts social factors as the cause, while architecture is reduced to playing the effect".[9]

Placemaking process: a learning place

The term "placemaking" has been used since the 1990s by the non-profit organisation Project for Public Spaces, which has subsequently defined it in the following terms: "Placemaking is both a philosophy and a practical process for transforming public spaces. It is centered on observing, listening to, and asking questions of the people who live, work, and play in a particular space in order to understand their needs and aspirations for that space and for their community as a whole".[10] According to PPS, "successful" places have four qualities: "they are accessible; people are engaged in activities there; the space is comfortable and has a good image; and finally, it is a sociable place",[11] and placemaking is "a collaborative process by which we can shape our public realm in order to maximize shared value".[12]

Place and placemaking are hardly distinguishable if we think of a place as a social construction. In vernacular culture, such a distinction does not arise: place is already placemaking. But the links between people and places, once taken for granted, have been broken and need to be reinstated. Thus, it is argued that public spaces no longer reflect people's lives and aspirations, so they need to be "transformed". But people cannot re-establish lost links on their own, and this is where placemaking – as a process guided by placemaking experts– comes in to help. In fact, such self-consciousness about the act of "placemaking" is evidence of a loss, of a crisis derived from our expert culture; as Alexander claimed, a state of "selfconsciousness" which emerged with modern architecture.[13]

To the extent that placemaking aims to empower people to transform their living environment into a "place to feel good in, to belong to and be proud of"[14] it can be seen as an educational process structured in a sequence of stages: defining a place and identifying stakeholders, evaluating existing environments, proposing a vision for change, implementing and evaluating the changes, assessing the impact of the transformations and propose new actions.[15] This sequence is not linear, but iterative: once the change has been performed, a new process of action and reflection follows, leading to a reformulation of the aims and to further actions.[16] As in action research, those participants affected by the problem at stake are involved "in the research through a cyclical process of fact finding, action, and reflection, leading to further inquiry and action for change",[17] as described by Minkler. Therefore, we can think of placemaking as a "learning place" embodied in the sociophysical milieu and as participatory action research where stakeholders are involved in the definition and solution of a problem, with the shared purpose of transforming an existing reality.

Placemaking and the architect's education

Today, it is widely acknowledged that the creation of liveable and sustainable environments requires the participation of experts and non-experts. As stated in the New Urban Agenda published in 2017, it is necessary to "promote civic engagement, engender a sense of belonging and ownership among all

their inhabitants […] enhance social and intergenerational interactions, cultural expressions and political participation […] and foster social cohesion, inclusion and safety in peaceful and pluralistic societies, where the needs of all inhabitants are met". [18] In a context that seeks to promote participation, architects become one more actor –and not necessarily the most privileged one– in a collective endeavour aimed at addressing societal and environmental problems.[19]

Schneekloth and Shibley see placemaking as an opportunity to "move beyond expert models to relocate and embed architecture –*implace* it– within a broader human endeavor that we call placemaking".[20] In placemaking, "knowledges of the professional, the place, and the local people are shared, disputed, negotiated, and considered".[21] As Till argued, in order to work with non-experts, architects might need "to re-imagine their knowledge from the perspective of the user"[22] in order "to move between the world of expert and user, with one set of knowledge and experience informing the other".[23] Thus, placemaking enables the creation of spaces of dialogue between experts and non-experts; it is an opportunity to expand the architecture discourse beyond the realm of the expert culture onto the complexity of real problems and enabling people to take part in the "inclusive, democratic, and civic projects of the twenty-first century",[24] as Schneekloth and Shibley contended.

Through placemaking activities, in A-Place we have created learning places which overcome the boundaries between academia and community, art and architecture, digital and physical spaces. These learning places can foster a form of situated knowledge production involving experts and non-experts, which could contribute to facilitate future professionals a better understanding of the issues which concern people and the skills to effectively incorporate them in the design practices; that is, to engage learners in practices aimed at interlinking "different cultural codes, experiences and languages",[25] as Giroux intended.

A WEAVED PLACE

In the past, the territory of the city L'Hospitalet de Llobregat was an agricultural area located between a mountain range, the Llobregat river and the sea, at the southwest of Barcelona. It received the status of city in 1925, and soon started to attract industries and then migrants from other regions of Spain, especially between 1960 and 1980, until it became the second largest city of Catalonia, with a population of around 265,000.[26] As a result of its development, the city is now part of the urban continuum of the metropolitan area of Barcelona, to the point that it is hard to distinguish where one city ends and the other begins, unless we look the municipal boundaries in a map. In the last decades, a new wave of migration coming from other countries, especially outside Europe, has replaced the earlier generations of migrants. Over the years, the city has grown as an aggregation of urban fragments which have filled a territory criss-crossed by transport infrastructures, train lines and motorways. Today, it is a multicultural society with 28% of the population born abroad, around 50,000 of them from non-EU countries. Some of its neighbourhoods have one of the highest densities in Europe (53,119 inhabitants/km² in 2011).[27] To avoid segregation and social exclusion among groups from multiple backgrounds living in dense and separated urban environments, the city is particularly committed to developing a sense of identity that brings together diverse social groups and neighbourhoods and reinforces their sense of belonging.

As part of the activities of the A-Place project, in October 2019 we started the programme "A Weaved Place" with the purpose of involving community actors and architecture students in activities aimed at forging links across the multiple layers of the sociophysical territory of L'Hospitalet (Figure 1): mapping abandoned and ignored spaces in neighbourhoods, finding out the memories and stories that people associate with places, and proposing interventions to activate the identified places. Due to the lockdown undergone in Spain during the spring of 2020, some of the activities were carried out entirely online, and later in blended format. These included:

- Mapping of the sociophysical territory carried out onsite and online (urban walks, digital maps) with diverse media (texts, photographs, videos)
- Pedagogic activities in public spaces, public facilities and online environments
- Interventions in public space (designing and building objects)

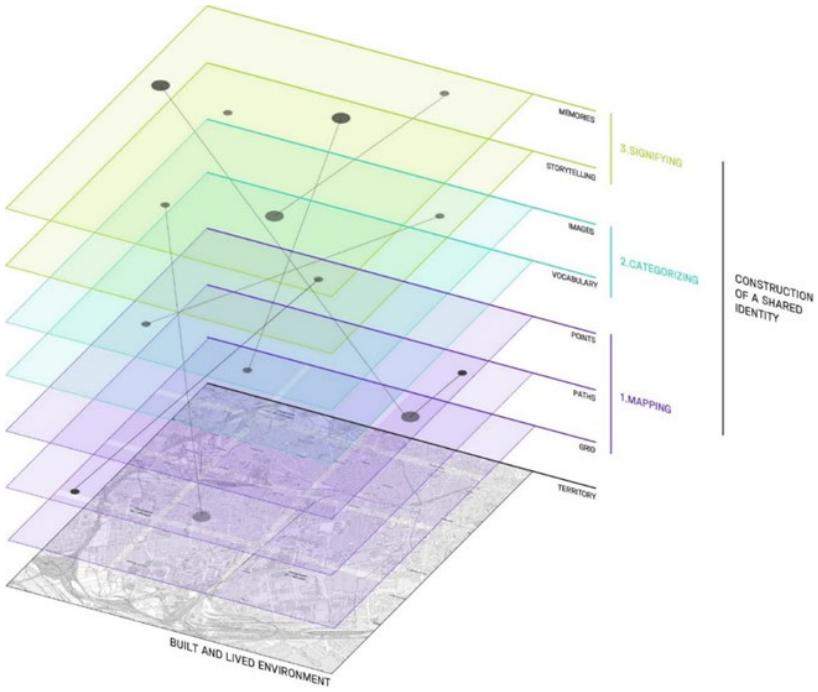

Figure 1. Interlinking the layers of the sociophysical territory with community-based learning and creative activities.

Creating transversal learning spaces

In architectural education, project-based methodologies have been used to integrate the various curricular areas, for example, design, construction, and urban planning, in the design studio. In this transversal learning space, faculty from the different subject areas interact with each other and students are expected to bring together the knowledge acquired in the various courses. Altogether, students and faculty reproduce in the design studio a model of reality "while also acting as a cohesive devise that builds community amongst the students and staff",[28] as Brown asserted. Furthermore, with "live" and "real" projects design studio education is extended beyond the academic premises –in the physical and conceptual sense– to create links with "real" problems which need to be solved interacting with "real" community actors in "real" settings.

However, as Luckan contends, "The fundamental problem is that interdisciplinary curriculum does not necessarily translate into interdisciplinary practice" which can only occur when architects "engage with the culture of place".[29] Learning places created around placemaking enable to move beyond the interdisciplinarity of the design studio, and to transcend the interlinking between architectural curriculum and practice. Since placemaking aims to create "good" and "successful" places in collaboration with other community actors, architects –as students and as professionals– need to engage in a research in and with the community. This research embraces not only architectural and urban issues, but also ethnographic, sociological, cultural and political ones as well. This means, as Schneekloth and Shibley argued, to emplace architecture to make it part of "a larger practice of place".[30]

In order to emplace our learning in L'Hospitalet, during the academic year 2020-21 we created a transversal learning space which included three subjects of our five-year architectural curriculum (Figure 2): LAB Design Unit (fourth year), Urbanism (fourth year) and Systems of Representation (third year). According to a tripartite structure based on the sequence Mapping-Building-Reflecting (Figure 3), each subject would contribute to the common task of finding spaces in the city to be activated through placemaking interventions: urbanism students made an analysis of the urban structure and identified potential spots for the intervention (Figure 4); students in the representation course contacted social and cultural organizations, activist groups and civic leaders and organize meetings and forum discussions online during the lockdown (Figure 5), and later made a visual analysis of the cityscape with photographs (Figure 6), and design studio students made proposals for mobile structures to hold performances, exhibitions and workshops in public spaces (Figure 7). Through the interconnection of different subjects and the contact with communities, students were expected to develop their capacities for interdisciplinary work and their communication skills with non-experts. For the community members, participation in the activities would contribute to increasing individuals' and groups' awareness of the value and meanings they give to their living environment, and to sharing these with the community. For both academic and community stakeholders, their participation in the activities would lead to a reciprocal exchange of knowledge.

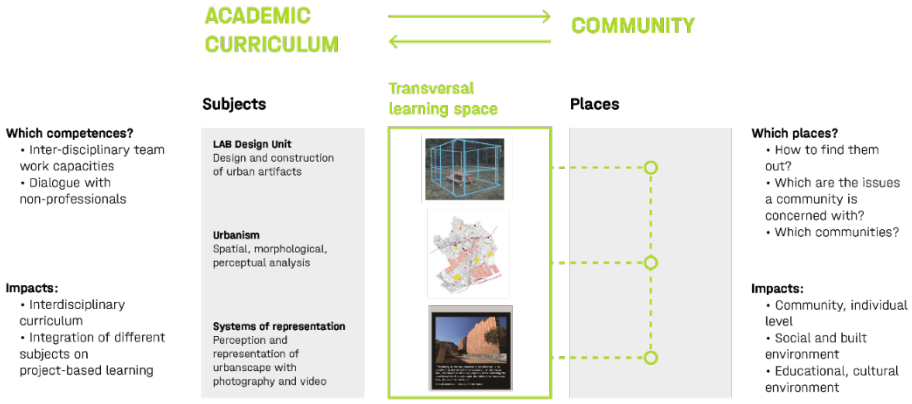

Figure 2. Emplacing architectural education in the community.

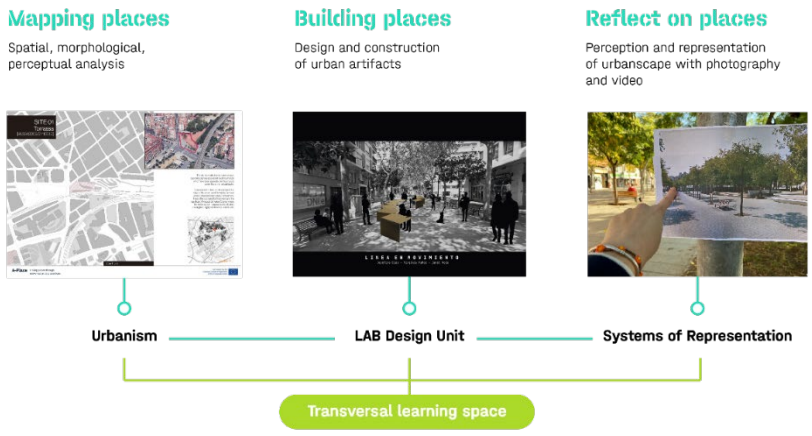

Figure 3. Interlinking the three subjects of the curriculum in project-based learning.

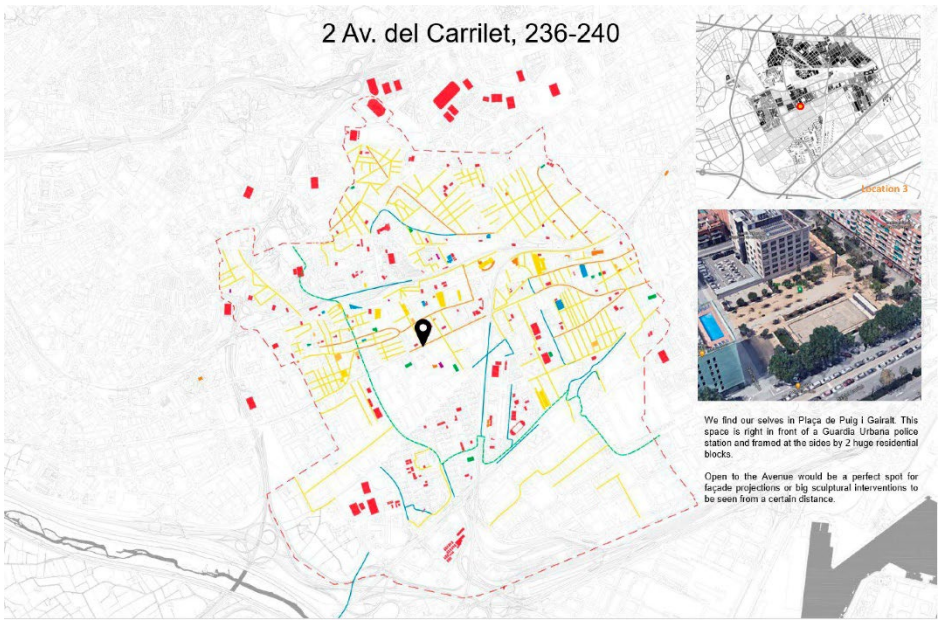

Figure 4. Proposal for a space to be activated with placemaking activities. Students: Lucas Escudero, Jordi Carbajo, Virginia Muñoz, and Ekaterina Smal.

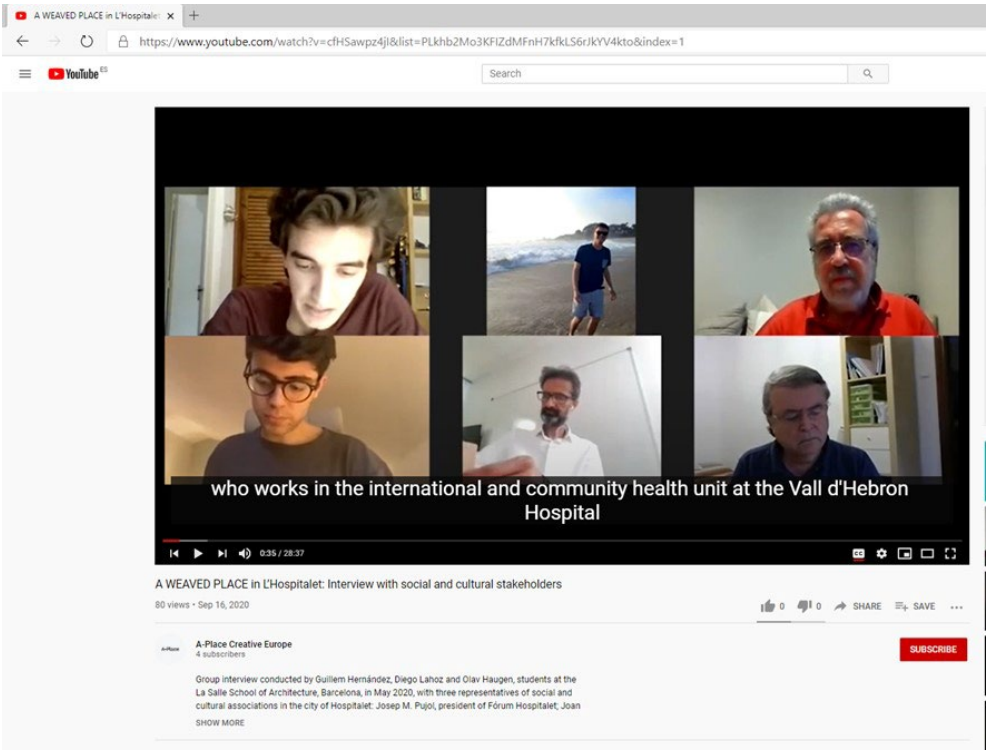

Figure 5. Focus group with community representatives held online. Students: Guillem Hernández, Diego Lahoz, and Olav Haugen, Systems of Representation, 2019-20.

Figure 6. Visual analysis of the city, linked to readings on urban theory. Student: Melissa Gandara, Systems of Representation 2021-22.

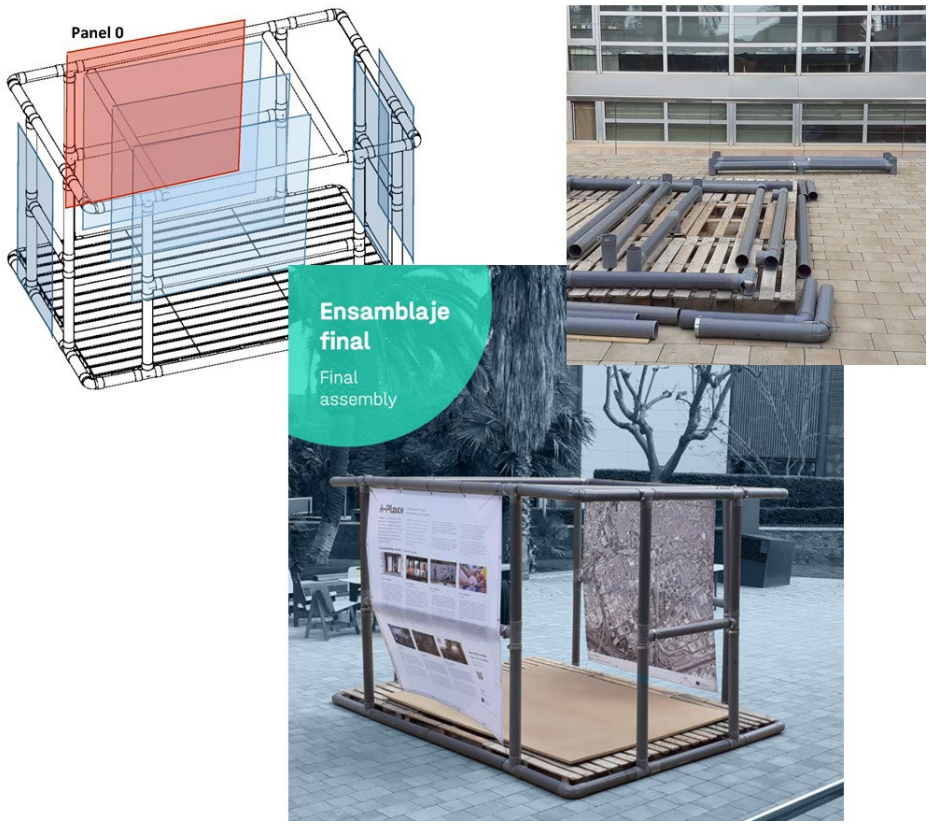

Figure 7. Prototype of modular structure to install in public spaces. Students: Omar Masoud, Ernest Sánchez, and Carolina Soto, LAB Design Unit, 2020-21.

Creating learning places

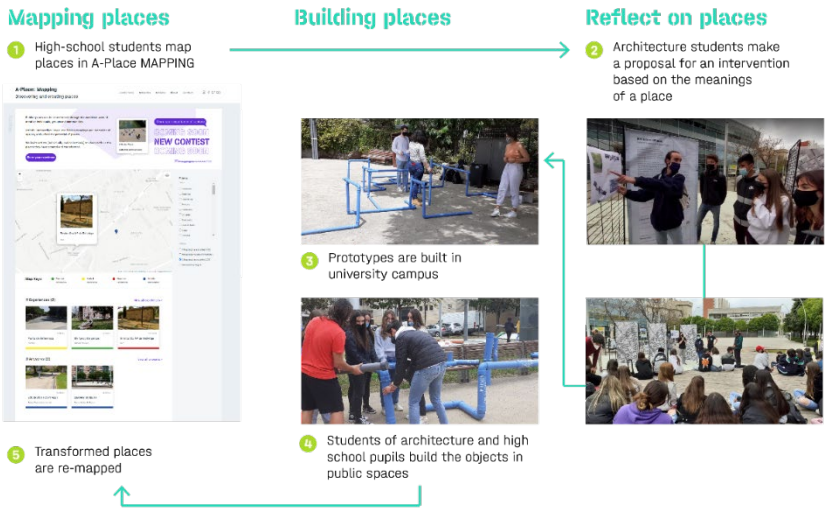

Figure 8. Sequence mapping, reflecting, building.

From April to October 2021, the interlinking of activities was extended beyond the limits of the academic curriculum to include community actors –neighbours, students and teachers from local schools– in learning activities and interventions taking place in the city premises, educational institutions and public spaces (Figure 8). We designed learning activities for high school students from local secondary schools to develop an awareness about the personal links they create with public spaces. The first task was to identify a place in the neighbourhood to which pupils attached a particular value, a life experience they had in the past, positive, negative or neutral. They described the experience with a text and a photograph published in the online environment A-Place: MAPPING. [31] After reading the accounts of the pupils and visiting the places they identified, architecture students made a proposal for an installation inspired in their experiences with places. Then, architecture students presented their proposals to the younger students in a joint event held in a square in front of the civic centre. The feedback and comments of the pupils were taken into consideration in the next design iteration. Finally, a prototype of the proposed intervention was built in the university campus, before it was installed in the public spaces of the neighbourhood, collaboratively by architecture students and pupils from secondary schools (Figure 9).

Figure 9. Installations in public space of the Bellvitge neighbourhood, L'Hospitalet, November 2020. Students (left to right, top to bottom): Mateo Juncos, Robert Martí, and Pau Martín; Nora Slenes Nilsen, Clàudia Pérez, and Dmytro Zhechev; Inês de Oliveira, Juliana Díaz, and Leonardo Fiore; Duygo Demiroğlu, Ivette Gutiérrez, Isabella Jaramillo, and Lexian Ye.

The activities were regularly disseminated through the A-Place social media channels,[32] and the installation in the public space was followed by the local media, press and television.[33] This was important for students to exercise their communication skills, explaining in a non-expert language the work they did for the local media, television and newspapers.

With the combined activities we aimed at promoting an interdisciplinary curriculum, to increase students' awareness of the often invisible meanings that underlie public space, to contribute to develop their communication skills to work with non-experts. Moreover, these activities open up other learning possibilities for students: to understand the role of representation tools in the understanding of a city (drawings, photographs); to approach the notion of place from different conceptual perspectives; to actually transform a public space, with ephemeral interventions planned and implemented with community members. This learning space situated in the community, engaging various disciplines and levels of education, can be seen as a case of transdisciplinary knowledge acquisition in architectural education.[34]

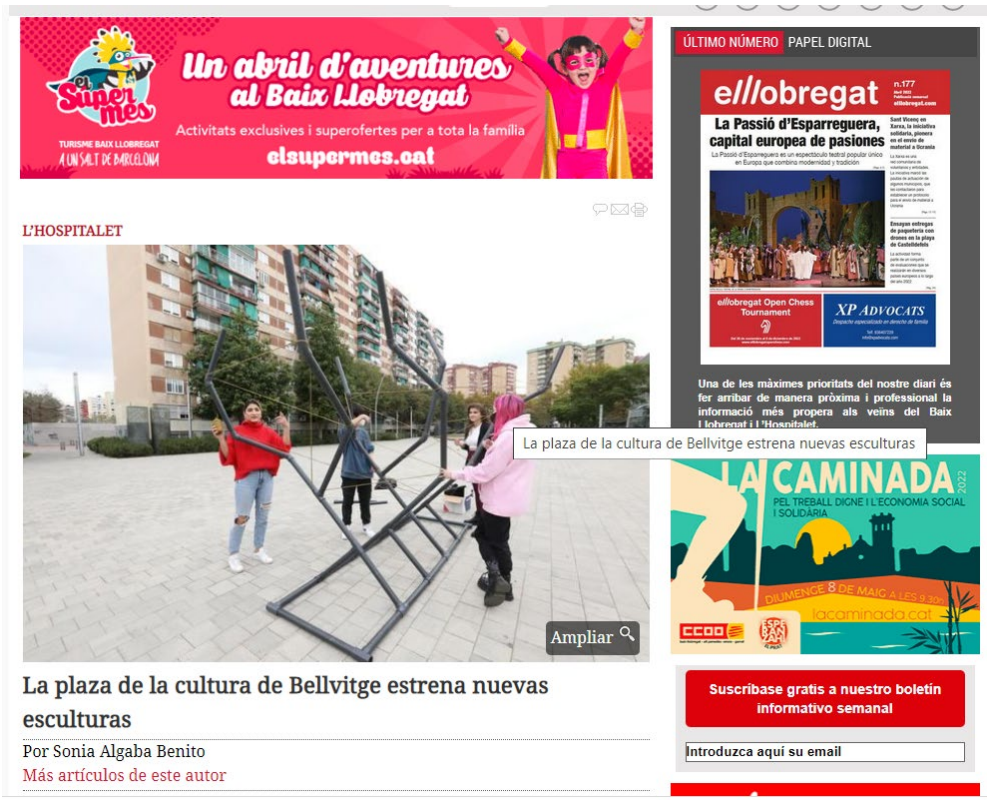

Figure 10. Dissemination of the interventions in public space through local media.

CONCLUSION

To implement learning process embedded in the community we need flexible strategies to manage open, creative process over time. Dealing with constraints and overcoming unexpected obstacles, are part of this process. Moreover, interconnecting subjects in the curriculum, creating links between universities and high schools, and fostering fruitful dialogues between experts and non-experts in a specific social and physical context, all require an extraordinary communication effort from all involved: staff, students and community actors. It is also necessary for all participants involved to understand and to situate themselves in an open, dynamic and collaborative learning process. This also requires a continuous communication among all actors involved in the learning process, which is key to maintaining the level of commitment of all involved.

The ultimate purpose of the transversal, community-embedded learning activities we designed and implemented is to bring about structural changes both in the academic curriculum and in the sociophysical territory. However, such changes might take a long time and they are difficult to trace. From a community perspective, a placemaking can contribute to visualize meanings, values and experiences that underlie the physical space through educational and participatory creative activities. The extent to which changes contribute to increase the sense of belonging and identity of the community members is however difficult to determine, particularly in the short-term. Similarly, a lasting transformation of the academic curriculum resulting from transversal learning experiences carried out under specific conditions (limited time, actors involved, results obtained) could be difficult to achieve.

ACKNOWLEDGEMENTS

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THE COLLABORATIVE CHALLENGE: BUILDING BRIDGES THAT CONNECT CAMPUS WITH THE FINE AND PERFORMING ARTS COMMUNITY

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INTRODUCTION

As a land-grant institution, the University of Missouri – St. Louis (UMSL) has a charge to positively impact our community. As the region's premiere public research university, and as stated in the current institutional strategic plan, the university seeks to be "a beacon of hope, a force for good and a powerful agent of change in Missouri and beyond. With a goal of becoming the nation's top urban, metropolitan public research university, the UMSL community is actively engaged in ongoing strategic planning efforts to ensure that we continue to live out our mission to transform lives."[1]

UMSL actively looks for methods by which to share a vision for socially engaged teaching. Through research efforts, instructional outreach, and community engagement and service, university faculty, staff, and students seek to "promote activities that encourage civil and constructive discourse, reasoned thought and sustained dialogue in an environment of inclusion, respect and appreciation."[2]

This paper will examine a collaborative group sponsored by UMSL. The Des Lee Fine Arts Education Collaborative (DLFAEC) is a partnership among fine and performing artists and teachers from the university campus, area public and parochial school districts, and a range of St. Louis nonprofit arts organizations. We will examine some of the impediments to be found in such an enterprise and offer some observations for steps toward eliminating barriers for collaboration.[3]

THEORETICAL FRAMEWORK

Beyond mission statements, there are other reasons for communities and universities to collaborate. It would seem an especially salient opportunity in the fine and performing arts. Resources for the arts are often limited and hard to come by. From around the globe, it is not difficult to find news stories reporting on arts funding being cut in the United States,[4] Australia,[5] and the United Kingdom.[6] At the same time, universities are experiencing budget cuts[7] across the United States,[8] even in locations where budget cuts have traditionally been less severe,[9] though many states hope additional funding may be coming their way.[10] There is an obvious rationale for a financial bridge to be built between campuses and community fine and performing arts communities.

Efficiency is another reason to frame partnerships around collaboration. When faced with the dilemma of scarce funding, and simultaneously, a belief in the power and importance in human existence, both educators and artists must find methods that maximize efforts. They seek "collective impact." The National Council of Nonprofits describes collective impact as "an intentional way of working together and sharing information for the purpose of solving a complex problem. Proponents

of collective impact believe that the approach is more likely to solve complex problems than a single nonprofit (or educational institution) approaching the same problem(s) on its own."[11] Collective impact has become a key part of the theoretical framework for the DLFAEC.

The DLFAEC also intentionally seeks to build community through collaboration. When teachers collaborate with other teachers, they better serve their students. But why just teachers within their own disciplines? How about teachers from different disciplines collaborating? "We might posit that sharing a project between two disciplines is not collaboration. Authentic collaboration requires what far too few of us are comfortable with: working with others outside of our discipline to co-construct knowledge."[12]

There is evidence that collaboration is framed in a developmental relationship. In his book *The Collaborative Challenge: How Non-Profits and Businesses Succeed through Strategic Alliances*, James Austin identifies three stages through which mature collaborative relationships develop between partners. The first stage he identifies as pure "philanthropy." One party comes to the table with funding; the other comes with a thank you. There is no reciprocity at this stage. Only the gift. If the partnership is worth further backing, then the relationship will move into a stage of development that Austin defines as "transactional." The transfer of time, talent, or treasure is regularized in some way and built into an accountable system. The final stage is the goal. If both parties find the relationship to be of mutual benefit, then both will find ways to contribute to the success of the relationship.

We have observed that, if a collaborative relationship remains stalled at the first stage, that is, one of pure "philanthropy," then the transaction will most probably become characterized by one party providing funds or services and the other party not receiving those funds or services with a thank you, but rather with a keen sense of entitlement.

Further, if a collaborative relationship becomes satisfied to remain at a regularized and stable "transactional" stage, then there is still space for dissatisfaction among partners. Perceived inequities between and among partners' contributions in effort or interest may not allow development into a level of collaboration that can enjoy the goals of efficiency, collective impact, and cross-disciplinary dialogue may not be realized.

The theoretical model for the DLFAEC turns to praxis through the application of nonbinding memorandums of understanding (MOUs). This is, of course, at a transactional level of collaboration. Outcomes of activities framed by these MOUs is based on core values that include 1) excellent curriculum and instruction, 2) quality artistic experiences, 3) a focus on providing fine arts experiences for underserved and diverse populations, 4) an integrated and collaborative approach to building programs, aiming for systemic and collective impact, and finally 5) encouraging potential for community building.

Previous Models

The DLFAEC began in 1996 as a partnership between philanthropist E. Desmond Lee and the UMSL. Lee's goal was to connect St. Louis through educational and community partnerships. The idea was to link the St. Louis cultural community with the expertise found at the local public university. Lee's vision included endowed professorships at the university that would be funded by a private gift, a match from the state, and a university-funded academic position. As time passed, other local universities joined the Collaborative.

The DLFAEC grew to 35 endowed professorships ranging from the arts to citizenship, science, community collaboration, nursing, and international studies. Lee promoted the vision "as a way for students, staff, and faculty to go beyond the traditional classroom activities to make a difference in the community."[13]

Visual art and music initially were separate endowments but merged to be the fine arts collaborative arm of the DLFAEC. The Collaborative involves three distinct groups working together to promote the arts. Agencies are community arts organizations like the Saint Louis Art Museum, the St. Louis Symphony, Saint Louis Ballet, and Metro Theater Company to name a few. A second group is comprised of local school districts that meet specific criteria, including a large population of students considered at-risk. These 15 school districts range from large urban to small rural. The third group are university faculty in the arts, including faculty specializing in theatre, music, and visual art education.

Before 2016, the relationship between local arts organizations, the Des Lee Fine Arts Endowed Chair, and local schools was, as described previously, either at a "philanthropic" or "transactional" level of collaboration. Arts organizations would determine programming, advertise children's performances, and then bill the Des Lee Fine Arts Endowed Chair for students who attended. While the school district members did collaborate on an annual Fine Arts Festival, each arts organization functioned separately. The Endowment primarily served as a funding source for students to gain access to the arts. While that opportunity is enriching and serves a vital role, opportunities to collaborate, provide professional development, and encourage dialog failed to materialize. Teaching and learning at all levels could be enhanced by engaging in dialogue to uplift the arts and arts education throughout the region.

This dialogue has begun. The practice of beginning the dialogue through the annual renewal of the Memorandums of Understanding prompts all partners in the Collaborative to revisit vision, mission, objectives, and then outcomes for the coming year, based upon a rubric of predetermined core values. With the guidance of the Director of the DLFAEC, much more "integrative collaboration" has begun to emerge. Other obstacles that are not driven by funding also need to be considered.

OBSTACLES TO SOCIALLY ENGAGED TEACHING

Socially engaged teaching requires effort, planning, understanding, and acceptance. The following are key considerations when developing socially engaged teaching collaborations.

Common Ground

A basic pedagogical principle is that, to engage the learner, we must meet the learner where they are. It is from the known that we may lead and encourage the learner on a journey of encountering new ideas, skills, and attitudes. Of course, that place of meeting may imply many dimensions. We might, for example, engage that fresh mind in learning using the imagination, especially for the novice or young learner. Michael Parson's aesthetic cognitive development theory[14] posits that the first stage of aesthetic engagement resides in, and springs from, the imagination – a place of "intuitive delight." It is a patch of imaginative grounding that serves as a springboard into exploring the colourful and brilliant world of sound, colour, shape, movement, and image. The collaborating educator joins the young learner in this space and leads them to places where insights about art can be developed. This is the partnership between teacher and learner that, in turn excites the collaborative educator's own practice.

There are, as Parsons explains, many significant aesthetic qualities that are yet inaccessible to these youngsters, and their experience of art lacks richness available to adults. We only reach deeper experiences with art through an education in which we encounter works of art often and think about them seriously.

Another dimension of common ground is found in digital places and on virtual platforms. The DLFAEC created such a virtual common ground for collaboration for students, school educators, fine arts organization artists and teachers, families, and other community stakeholders through the creation of a fine arts digital library. This library contains performances, master classes, lessons, lesson plans, and many other resources, gathered from the Collaborative members, and made available freely on the

Collaborative website. All resources are coded with learning standards as defined by the National Core Arts Standards (NCAS) and articulated specifically in the requirements of all 50 of the United States.[15]

Common ground may also mean, quite literally, common ground. That is, collaboration requires a meeting of the minds, wills, and in a very real way, a place. That place needs to be a place that is respectful and safe for all collaborators. Dr. Smith once had a very palpable experience that he believes illustrates the power of this principle. The *Primarily Arts Network* was a collaborative project involving university faculty, symphony orchestra staff, and schoolteacher personnel from a large urban school district in the U.S. Midwest. The charge of this grant project was to attempt to impact whole-school change and build community within a school environment, such that, incipiently, test scores and assessments might also show positive change. He intended to shape his efforts around engaging Chicago Public School teachers in exploring their own classroom curriculums (math, language arts, science, etc.,) using the fine arts tools to deliver meaningful and engaging interdisciplinary instruction.

He began the work and held the first meeting in one of the elementary schools within this large city. This was a tough school in a tough urban neighbourhood, with, as he and his colleagues were to learn, a tough faculty. It was an after-school meeting and, as he watched the room fill with these educators, he could easily see that they were not happy about being required to attend.

More palpable, however, was the suspicion and downright hostility he felt from the teachers – seeing white University professors coming into their school, and presuming to tell them how to teach their children. When the professors asked if they might simply send a clipboard around to collect names and emails, they received strong pushback. “Will you please just sign your name, give your email, and pass it around the group?” they asked. The response was curt and strong. “Hell, no!”

It became clear to the professors that they had much work to do. And that work would be for them to begin where these teachers were. Literally. Work in their school. Work with their curriculum. Work with their children. And the professors needed to put themselves on the line and in front of their classes to model the behaviours and ideas that they were attempting to foster – using the fine arts to teach across the curriculum.

The process of building trust was slow, but trust did develop. And that process was built on a willingness to engage the teachers on their terms, to seek to understand before being understood.

They had satisfactory results from the project. Test scores were impacted by the “whole-school change” approaches that they implemented. And the process started with building trust through authentic engagement. The process required finding common ground built on trust and meeting in a safe and respectful space.

Common Language

It may appear that, while all fine arts seem similar in their creative and expressive intents, they may not have a great deal in common beyond that. They all require quite different techniques and materials for them to be brought into being. Teaching with paintbrushes and clay is quite different from teaching with musical instruments. Some arts, such as music, occupy time. Others, such as visual art, occupy space. Still others, such as dance, occupy both time and space. How can creative artists and fine arts educators gather around collaborative projects to address common learning outcomes and lesson objectives in meaningful ways with such disparate tools and such different learning environments? One potential and potent answer, we believe, is to be found in the NCAS.[16]

The conceptual framework for NCAS was created and released in 2014 by a coalition of professional fine arts education organisations (National Coalition for Core Arts Standards) that came together to recontextualize and update arts standards that, as in the case of music education, had not been revisited since 1994. Virtually all 50 of the United States have adopted the NCAS, written state

standards based upon NCAS, or are in the process of reviewing and moving toward adoption in some form.

NCAS provides a framework of artistic processes that serve as a foundation for a common language among fine and performing artists. NCAS points to the fundamental activities that engage the creative process in all artistic endeavours and, therefore, guide the educational processes and outcomes of all artistic formats.

All the arts, NCAS points out, share common macro-processes and experiences. It can be thought of as a creative chain. The first link in that chain is the need to create. The art needs to be brought into being from out of nothing. For a musician, that may look like composition or improvisation. For a dancer, it may be choreography. For all artists, the NCAS process identifies a common process, or as we present here, a common language that all members of a fine arts and education community can use and adopt to build curriculum and instruction. To create, all art requires imagination. Next comes the plan to make, and finally, evaluate and refine. These are outcomes that transcend artistic processes or techniques and, as such, offer a common language for building bridges of collaboration.

The next step in the NCAS' creative process is the activity, performing or presenting the art. The standards offer language and more specific notions around which principles and praxis may be structured. Materials are selected, analysed and interpreted, refined, and presented or performed.

Finally, there is the opportunity for response. The listener of music, or the viewer of art, media, or dance, can select genre, artists, performance, venues, etc. There is choice involved, and sensitive collaborators are wise to note these possibilities. Audiences are also permitted to analyse, to interpret, and to evaluate. The artistic experience should acknowledge that important dimension of the artistic process.

Classroom Environment

The arts are included in most curricula for their opportunities to engage in creative works and expression. The arts are sometimes termed the creative classroom – and for good reason. The arts uniquely provide opportunities for creative expression[17] and are positively correlated with higher high school graduation rates,[18] better social skills,[19] a positive attitude toward school and learning,[20] and increased personal motivation.[21]

While the environment in the arts classroom may benefit the student in many ways, they are considered one of the prime opportunities for creativity in the curriculum. That, however, is not always the case. Often, the performing arts – especially music – become focused more on performance of repertoire than creativity. Even in the elementary classroom, some approaches to music education focus less on creative expression and more on music literacy.

In a socially engaged music classroom, the focus is on working together for a truly aesthetic experience, a shared experience that will inevitably enhance a student's music knowledge but also ensure that the student has opportunities to explore, create or improvise, and experience music and other arts. This might range from a guided listening experience where students hear something they might not have otherwise noticed, to rearranging a known melody to form a new tune, to creating a new melody using a favourite poem or verse.

CONCLUSION

Arts organizations, local schools, and universities can build strong partnerships that benefit students of all ages, university partners, and the community at large.

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HUMANS OF INTERIORS – DIVERSITY BY DESIGN

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INTRODUCTION

Knowing the world is often about seeing the world.[1] Within the disciplines of Interior Architecture and Design, visual depiction of spaces is a powerful tool to communicate use, users and qualities of the designed/proposed spaces. With a mixture of techniques we can produce images capable of plunging viewers directly into these imagined spaces. Visual depictions of people demonstrate social norms and values, teaching viewers how the world works and their place within it via symbolic socialisation. [2] Such visualisations, so provocative and seductive, are carefully designed to communicate the atmosphere that the designer is aiming to create, but if they fail to include a fair representation of the people those spaces are designed for, they misrepresent the aim of the project. This distinct lack of diversity and inclusivity within visuals is indicative of both a lack of consideration of the existence of people who are not the same as the designers themselves (who are overwhelmingly young, white and able- bodied[3]) and an equally problematic lack of understanding of the needs of these populations.

The paper is the account of a collaboration, a research project and a series of workshops conducted over the last few years by the University of Lincoln and Middlesex University London. Humans of Interiors/Diversity by Design aims at promoting a discussion across education and industry on the impact that visualization has on the representation of future spaces and whom these spaces are addressed and designed for: a discourse about social sustainability of spatial design. The research activities underpinning Humans of Interiors/Diversity by Design and the workshops devised internationally, help establish equality, diversity and inclusion (EDI) as an integral part of the design process and enable participants to apply their own critically reflective knowledge and understanding of these principles to the development of their design.

REPRESENTATION MATTERS

“Representation in the fictional world signifies social existence; absence means symbolic annihilation.”[4]

Over recent decades, interior architecture and design has established itself as an influential discipline, able to draw connections between spaces, people and objects and effectively communicate and disseminate to a broad audience: exponential growth in terms of projects, courses and debates has contributed to opening up the discipline on a global scale. However, despite working with and teaching a growing international group of people, we are aware that our cultural narratives tend to originate from a specific western canon, shaped by a very specific geographic and cultural niche. The way in which we model and explain spaces is deeply rooted in our own culture and in a very specific way of understanding the world.

Figure 1. Figures produced by BA and MA IAD students during the T&L innovation funded workshop 2020, University of Lincoln

As educators, we aim to foster a global spatial-narrative dimension for interiors, which allows a wider social, political and economic context to emerge. The work produced by our students reflects these ambitions, questioning the way we inhabit the world and how we can provide everyone with a better space to live, work and enjoy life.[5]

We can proudly assert that those principles translate into disruptive proposals, deeply rooted in research and innovation. However, when it comes to students visualising their ideas, often the representations of inhabitants for their spaces tend to fall short of reflecting the real world - portraying a more narrow and rather conformist view. The images used to portray our designs are much more than a communication tool as they offer an insight of a vision of our future world. More specifically, how we choose to visually depict people in our designs, demonstrates the social norms and values of this future world.

However, in investigating the process of producing such visualization, we understand that this part of the process is often no more than an afterthought, which demonstrates a lack of understanding of how the final visualizations impact the future of those spaces; most of the time these images are not even reflective of the demographic they have been designed for. More consideration of diversity and inclusion within design have the dual effect of encouraging end-users to feel more welcome within a space, and to highlight to the design community, the fact that end-users have differential needs based upon their individual characteristics

Figure 2. Figures developed by Elizabeth Fadairo, Interior Architecture Graduate 2021, Middlesex University

DIVERSITY AND INCLUSIVITY BY DESIGN

Design is a human-centred discipline with many interrelated and complementary fields that imagine and realise objects, spaces and future scenarios. Spatial design, specifically, is a very complex multi-disciplinary realm where different knowledge merges in order to explore, propose and produce spaces that can enhance human inhabitation and experience. The way in which we communicate our projects to stakeholders and end-users is a key part of what we do as designers, as the way we present and represent the spaces we design, impacts upon how these spaces are perceived and used. Extended research prompts the final choices to communicate materiality, usability, performance, functionality and technology, and the images used to portray our designs are much more than a communication tool

- they put forward ambitions and ideas for the vision of our future world.
Inhabitation, and how we choose to visually depict people in our designs is key - demonstrating the social norms and values of this future world, but - when it comes to populating the imagined spaces with inhabitants, designers rely less on extended research. Both in academia and industry, there is a reliance upon stocks of readily available images of people, which do not always reflect the diversity of the context, and therefore, the needs of the project. This lack of diversity in the people represented undermines the communication of the ideas behind the design; if we are designing a community centre but fail to include the full range of local inhabitants, we miss the aim of the project, no matter how good the project is in other respects. Of course, the project visualisations are not the only criterion through which a project is assessed, but they are crucial to how it is accessed and understood by the wider public.

Figure 3. Image developed by y2 Interior Architecture and Interior Design students, Middlesex University 2021-2022 (ID: Bielecka, Marlena, Marshall, Roslyn, Shahrestani, Rayhaneh, Wadud, Tasnim Taz, IA: Alessandro Viscardi, Diana Caiza, Hope Irinoye, AT: Jamally Francis).

The quality of the spaces we research, reflect on and design, has a big impact on the quality of people's lives. Decisions about how we imagine those places, their details and the interaction between people, spaces and objects can enhance or restrict a sense of belonging.
Designing spaces, we can help by removing real and imagined barriers between people and communities and foster a better world. On the contrary, such misrepresentation of users of the designed spaces can cause individuals or groups to feel excluded from spaces that are not welcoming, safe or designed for them[6]. 'People that have difficulty accessing and/or using products and services ("edge users") are often not included in the design process'[7] and are very rarely represented within design visuals. While some people on this spectrum are excluded altogether, a much greater number are inconvenienced, and these spectrums are rarely linear; in many cases, they are intersectional and multi-dimensional.
It should be noted that architectural visualisations do occasionally represent individuals with physical disabilities, however, this is typically because disability directly relates to pragmatic needs in

buildings for: entry access; vertical circulation throughout the building; escape routes; and accessible WCs. There tends to be little consideration beyond this in terms of EDI[8], and when there is, these portrayals can be negative, one-dimensional or reflective of incorrect assumptions and stereotypes[9].
It is important to acknowledge that each of the choices made by a designer about who to include as an inhabitant of a space is a political decision, a specific way of spatial identity-making and urban space-production, so this lack of attention is not just a matter of superficiality - it also reflects a limited cultural approach, in which designers are either unaware of, unable or not inclined to question the socio-political environment in which they are working.
To counter such limitations, we encourage the careful consideration of specific key personal and 'group' characteristics. Including these as part of the creative process can prompt critical reflection about who the inhabitants really are, and whom these spaces are actually being designed for[10]. More diverse and inclusive visuals in design projects have several positive effects, such as a wider range of end-users feeling more welcome within a space (a 'mirror' for marginalised groups to view themselves as included). The generation of more diverse and inclusive visuals will also highlight the diversity of the needs of end-users, based on their individual characteristics (serving as a 'window' through which designers themselves can understand more diverse needs). By extension, this also widens access to design as a career and a cultural field, as people from diverse backgrounds feel included when they see that design is for people like them.

Starting with Unconscious Bias

As we have stated, this distinct lack of diversity and inclusivity within visuals is reflective of both a lack of consideration of the existence of people who are not the same as the designers themselves, but also a lack of understanding of the needs of diverse populations[11]. For the most part these exclusions are not deliberate; they simply reflect the experience, awareness and inclinations of the students themselves, but this is how unconscious bias is communicated - providing a subtle message about who a space or place is meant for.
Our own qualitative investigations have revealed that this may be due, in part, to a lack of explicit instruction in how to counter unconscious bias and consider EDI, not only during the first steps of the research, but across the whole design process[12]. The conventional lens through which inhabitants are represented needs to be clearly redressed to include non-western ways of living, non-binary ways of being and to reflect on issues of class, gender, race and other individual characteristics. Our workshops involve challenging and remaking the current pedagogy, which has thus far been rooted in a specific geo-cultural niche.

Humans of Interiors/ the Workshop

This project is a collaboration between academics from The University of Lincoln's School of Psychology and the Interior Architecture programmes, and Interior Architecture at Middlesex University, and the Academic Writing and Language team at Middlesex University. We have developed a series of targeted and inter-disciplinary workshops with which to ensure that Interior Architecture and Design students, educators and practitioners, are equipped with the knowledge they need to deliver presentations and discuss unconscious bias in representation, as well as inclusivity and diversity. We encourage our students to challenge un-/subconscious social norms by introducing the psychology behind the ideas of bias, individual differences and intersectionality (the understanding of how aspects of a person's social and political identities combine to create different modes of discrimination and privilege, [13] and how these combines to impact our way of viewing and experiencing the world. Our seminars and exercises then facilitate discussion of how this change of perspective can be used in a practical sense to impact design outcomes and ensure diverse and

inclusive end-user engagement to develop meaningful relationships with communities that contribute to a design: designing *with* rather than *for*. These workshops also teach the importance of including a broad range of figures who represent the users of buildings; not just to highlight a practical necessity, but to represent and promote the diversity within our society.

Figure 4. Figures developed by Charlie Wooton (Year 3 IAD) during a research project associated with our workshops, University of Lincoln.

In January 2020 the University of Lincoln Teaching and Learning Innovation Fund supported an initial Diversity and Inclusion Workshop that was run within the School of Design, experience that was repeated in October 2020 at Lincoln. This workshop exposed students to an understanding of unconscious bias, established EDI as an important principle within IAD, and guided students in the application of this knowledge to develop innovative figures for their visuals.

At Middlesex University, EDI is an important principle that guides the briefs, carefully devised to be inclusive and open to define projects that are relevant for all.

In November 2020 these two approaches merged in delivering a collaborative workshop that was delivered at Middlesex University, combining the seminars on unconscious bias and EDI with a seminar on text-based narrative and the creation of graphic figures. We used exploratory writing activities to help our students invest the people they drew with believable personal identities. These activities included asking students to go and find an object that they imagined might belong to a person they were drawing. We asked them to focus, in spontaneous free-writing, on concrete-actual qualities of these objects; and then to make up anecdotes about them, that the person they were drawing might tell. This kind of generative writing helped the students build up a believable sense of their characters, so that when they drew them, they felt they knew them, a bit.

Figure 5. Figures developed by Year 3 in Interior Architecture at Middlesex University in connection with our workshop. The gallery includes the inhabitants of the Major Projects of Imaan Zorah Daureeawoo, Chung Yin Ha, Tiar'Na Aaliyah Iesha R A J T Banton, Jr-Yun Lin, Sareh Sarvar, Marwan Mohamed Hagi Mak, Leah Yazmina Roberts, Nancy Surajkumar Prajapati, Elizabeth Fadairo, Katherine Louise Dixon, William David Webster, Hozan Aziz, Ashna Butt, Paulina Agnieszka Kalferszt, Viktorija Marcinkeviciute, Tamara Oluwakemi and Hannah Orebiy.

Figure 6. Figures produced by year 2 IAD students Lauren Glass and Wiktoria Rabij as part of the UROS project 2020, University of Lincoln.

The figures produced by students were inclusive, innovative and reflected the protected characteristics. The range of figures produced can be used in students' projects, as a teaching tool, as will serve to help internationalise the representations used within both student and staff projects, and provide significant wider impact as a result.

The workshop has been the starting point of a revision of the design process and methodologies across the programme to embed EDI throughout the curricula.

The workshop has been piloted, refined and run at the University of Lincoln and Middlesex University in the UK in 2020-2021, and again in 2021-2022. Humans of Interiors is part of the curriculum and is delivered, in different versions - each one with specific outcomes, to all year groups

in the BA and MA programmes in Interior Architecture and Design Programmes. From the current academic year, we have delivered talks and presentations to conferences and international partners[14] and are designing an event that will broaden the context looking at other creative industries programmes like Fashion or Graphic Design.

CONCLUSION

Quantitative and qualitative feedback from our workshops has demonstrated that students feel they come away with a better understanding that different end-users have different needs in different contexts, with more awareness of personal characteristics and how these interact to impact upon the individual, and an increased understanding of the impact that visual depictions can have.

Following the workshop, one student from the University of Lincoln reflected

I was shocked to reflect upon my own work thus far and that of my peers only to recognise such blatant exclusion... I felt instantly compelled to engage with the [workshop] and it is my hope that through my participation and contribution to it that I will be able to educate those around me now and a wider circle as I progress through my career.[15]

Figure7. Image produced by Irma Signe Linnea Vesterlund, Interior Architecture, Middlesex University, y2 2019-2020.

Prior to our workshops, 82% of student respondents rated the choice of visuals as "somewhat important" whereas afterwards 91% rated this as "very important" and although 58% of respondents were only "a little bit" or "somewhat" confident in engaging with, including or designing for marginalised communities beforehand, afterwards 75% of respondents were "very" confident. We also found that 88% of respondents felt that our workshops had positively influenced the way in

which they considered the inhabitants of interior spaces when designing visuals.
“My design has more multicultural figures and is definitely more ‘’alive’’ since I brought diversity into my projects”,[16] “I could see the benefit not just in mine, but my colleagues’ designs and them becoming more inclusive after the session.” [17]
The legacy of the workshops intends to contribute to a sustained understanding of the effects of unconscious bias, both when selecting figures, and the consideration of inclusivity in a broad sense when working on design projects. The positive effects of the unconscious bias workshop and following conversations have resulted in a deeper understanding and application of knowledge surrounding intersectionality and the application of this knowledge to projects. This is evidenced with several award winners and shortlisted projects from Middlesex University at the Interior Educators awards in the category of ‘equality, diversity and inclusivity’[18] – as illustrated in Figure 7 and 8.

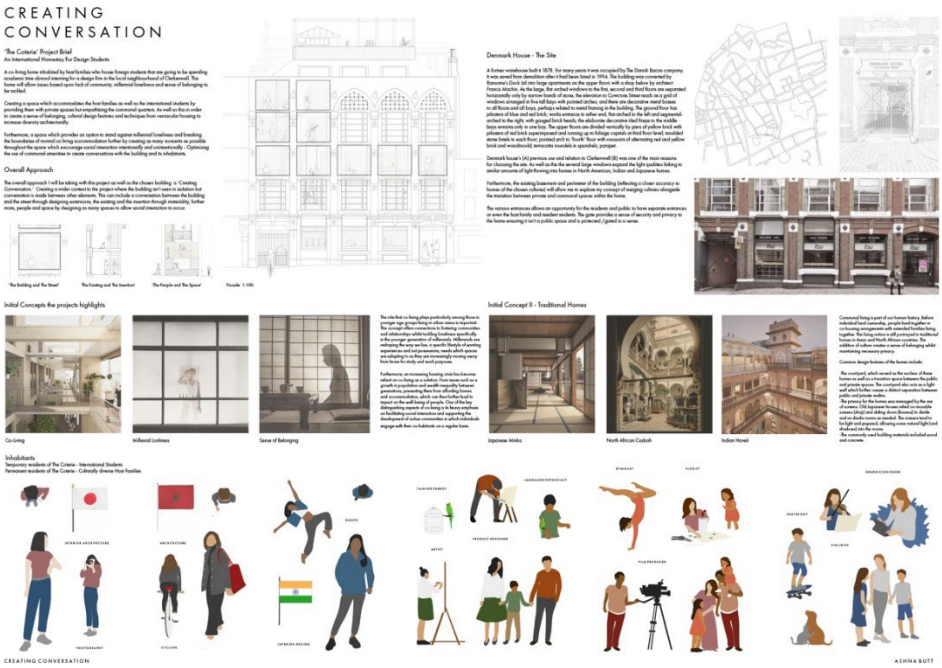

Figure 8. Images produced by Ashna Butt - Interior Architecture Graduate 2021, Middlesex University.

Students awareness not only of what they produce as designers and how they represent people in visuals, but also how an understanding of unconscious bias can support them moving forward in to the workplace was emphasized by recent graduate Josh Haynes. He states the following
With the aspiration of attaining a successful career spanning geographical boundaries, cultures and social contexts, it is imperative that my work (individual and collaborative) be both tangibly and intangibly respectful and accessible to all people. Devoting my personal time to the ongoing research into *unconscious bias* and contribution to awareness campaigns is something I am eager to do as part of the ongoing mission to offer equal opportunities to everyone in the modern day as well as my personal inclination to collaborate with those of differing professions (in this case psychology) in order to develop a holistic outlook within both my career and my personal endeavours.[19]
The evaluation of the workshops, seminars and projects has been evidenced in the success of final design projects and in the attention they gained specifically on their ability to be inclusive,[20] both within the university and nationally, as well questionnaire responses and qualitative feedback. Further action is proposed to evaluate the students understanding and application of unconscious bias and EDI principles in design and written work over the duration of their time spent at University and post-graduation. Once in the workplace, follow up discussions with students could take place to evaluate

whether the workshops have lasting effects in relation to the approach to design projects and choices of figures used, as well as decision making in seeking jobs and determining whether a company has an inclusivity statement and is actively seeking to employ people from diverse backgrounds.

NOTES

[1] GIllian Rose, *Visual Methodologies: An Introduction to the Interpretation of Visual Materials* (London: Sage Publications, 2001)
[2] David H. Weaver, "Thoughts on Agenda Setting, Framing, and Priming." *Journal of Communication* 57, no1 (2007): 142–147. doi:10.1111/j.1460-2466.2006.00333.x.
[3] Sally Benton, Stephen Miller and Sophie Reid, *The Design Economy* (London: Design Council, 2018), https://www.designcouncil.org.uk/resources/report/design-economy-2018.
[4] George Gerbner and Larry Gross, "Living with Television: The Violence Profile," *Journal of Communication* 26 (1976): 172-199.
[5] Edward Steinfeld and Jordana Maisel, *Universal Design: Creating Inclusive Environments* (Hoboken, NJ: Wiley, 2012)
[6] Catherine Horwill and Elli Thomas, *Inclusive Design: Beyond Accessibility* (London: Design Council, 2019), https://www.designcouncil.org.uk/news-opinion/inclusive-design-beyond-accessibility
[7] Centre For Inclusive Design, *The Benefits of Designing for Everyone* (London: Price Waterhouse Cooper, 2019), https://centreforinclusivedesign.org.au/wp-content/uploads/2021/05/inclusive-design-report-digital-160519.pdf.
[8] EDI stands for Equality, Diversity & Inclusion.
[9] Catherine Horwill and Elli Thomas, *Inclusive Design: Beyond accessibility* (London: Design Council, 2019), 6. https://www.designcouncil.org.uk/news-opinion/inclusive-design-beyond-accessibility.
[10] Tasoulla Hadjiyanni, "Rethinking Culture in Interior Design Pedagogy: The Potential Beyond CIDA Standard 2g", *Journal of Interior Design* 38 no3 (2013): v–xii.
[11] Rob Imrie, "Architects' conceptions of the human body", *Environment and Planning D: Society and Space* 21 no1 (2003): 47–65, https://doi.org/10.1068/d271t.
[12] Matteo Zallio and P. John Clarkson, "Inclusion, Diversity, Equity and Accessibility in the Built Environment: A Study of Architectural Design Practice", *Building & Environment*, 206 (2021): 108352. https://doi.org/10.1016/j.buildenv.2021.108352
[13] Kimberlé Williams Crenshaw, "Demarginalizing the Intersection of Race and Sex: A Black Feminist Critique of Antidiscrimination Doctrine, Feminist Theory and Antiracist Politics," *University of Chicago Legal Forum,* 139 (1989); Sumi Cho, Kimberlé Williams Crenshaw, and Leslie McCall, "Toward a Field of Intersectionality Studies: Theory, Applications, and Praxis," *Signs* 38 no4 (2013): 785–810. doi:10.1086/669608.
[14] Design School, Politecnico di Milano, MSc Interior and Spatial Design, April 2022.
[15] Year 3 Interior Architecture and Design Student, University of Lincoln (UK).
[16] Year 3 Interior Architecture and Design Student, Middlesex University (UK).
[17] Year 3 Interior Architecture and Design Student, Middlesex University (UK).
[18] Interior Educator is the subject association representing well-established Interior programmes from across the UK with more than 50 Higher Education institutions. The National Awards are a well-established student competition that awards prizes for graduate and progressing students. From 2022 the National Awards has introduced a specific category *Diversity, equality and inclusion* that "awards for projects which address issues of social justice and equality, and fundamental human rights and dignity for all'.
[19] University of Lincoln, Undergraduate research opportunities scheme grant application 2019.
[20] *Diversity, equality and inclusion* for the National Awards by Interior Educators. In 2022 for Graduating Students, Shortlisted Ashna Butt Middlesex University London, for Progressing Students Irma Vesterlund - Commendation Middlesex University London

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ARCHITECTURAL DESIGN JURY UNDER COVID-19: THE CASE OF GRADUATION PROJECTS AT A UNIVERSITY IN THE UAE

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INTRODUCTION

COVID-19 forced changes to teaching and learning modes, including those of architectural design. In the University under study, students and instructors transitioned to remote online teaching around the middle of the spring 2020 semester. Since then, the architectural design studio jury has undergone multiple changes as faculty navigated the evolving situation of COVID-19, familiarity with new tools, and the strong jury tradition.

Since the mid-twentieth century and until the COVID-19 pandemic's effects were felt, the jury tended to have similar format in universities.[1] The common jury arrangement included drawing sheets of the project under review pinned to the wall, a model of the project, and sometimes a screen displaying a video of this project (Figure 1).[2] Prior to COVID-19, this setting applied at the studied program. But when the reviewed project included a substantial research component, the data projector and white screen replaced all or some of the drawing sheets. Musa described how traditionally in the program under study students stood next to the displayed material facing the jurors to whom they presented the project, while students' peers, family, and friends stood or sat at the back of the room where the jury took place.[3]

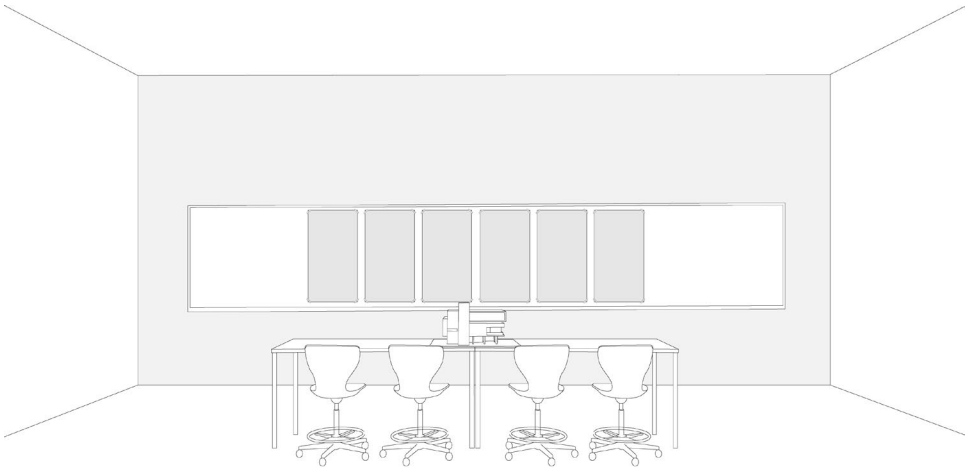

Figure 1. Pre-COVID-19 jury setting (by Majd Musa)[4]

This paper investigates the architectural design jury system under COVID-19 in a university in the UAE. It discusses how the conventional jury for graduation projects was realigned between March 2020 and December 2021 when the university had to adapt to the new condition of social distancing and remote learning. The paper explores changes to the traditional form, practices, and roles of the jury and their implication to architectural design education.

RESEARCH METHODS

The research was primarily conducted through surveys of views of senior students at the university under study. The surveys were followed by interviews with some participants.[5] The research involved literature review and reflection on the authors' experiences: the experience of an instructor and jury member and that of a previous student familiar with the jury transformation under COVID-19.

The research participants were selected from students who had the graduation project juries in spring and fall 2020 and 2021. The surveys were conducted online in February 2022. The participants had two juries in each semester: interim and final juries. The fall juries reviewed Phase I of the graduation project, which had a substantial research component; the spring juries reviewed Phase II. Projects varied in scale and nature, and students worked in teams of two or three. Except for spring 2020, the juries consisted of a fifteen-twenty-minute presentation by the students and a ten-fifteen-minute critique by the jurors and response by students.[6] A few juries had external jurors; most juries only had faculty supervising graduation projects, but not the ones they judged.

LITERATURE REVIEW

Scholars addressed the traditional architectural design studio jury in different contexts and emphasized its need for reform.[7] Anthony found the jury system inadequate as a learning tool.[8] Similarly, Jones argued for reconciling the formative and summative roles of the jury.[9] In her turn, Webster called for fixing the imbalanced power relations in the system.[10] Musa analyzed the conventional pre-COVID-19 jury at multiple studio levels in the program under study.[11] She found that the jury emphasized assessment over learning and had uneven power relations that leaned towards the jurors. Musa recommended reforming "the institution of the jury and power relations embedded in it," being "open to change and experimentation," and utilizing recent technologies "to bring the age-old design jury to the 21st century."[12]

In the past two years, scholars studied the jury under COVID-19 in other universities, including those in Egypt,[13] Jordan,[14] and Iran.[15] They reported juries conducted online in virtual meeting rooms and agreed that the jury was negatively impacted.[16] Al Maani, Alnusairat, and Al-Jokhadar and Megahed and Hassan attributed that primarily to the absence of face-to-face communication.[17] Alnusairat, Al Maani, and Al-Jokhadar and Asadpour pointed out the resultant lack of an emotional connection to jurors and the unsatisfying student-juror relationship respectively.[18] However, these scholars noted some benefits of the online jury, including accommodating overseas jurors, paving the way to blended learning,[19] and, since the juries were recorded, serving as a record for students.[20]

Studying the transformation of the interior design jury for graduation projects in another university in the UAE, Ahmad, Sosa, and Musfy reported that the jury included a virtual reality exhibition room modeled after the program's exhibition gallery.[21] Students prepared soft copies of the traditional posters and virtual models that were exhibited in the virtual exhibition, and they created their own branded e-folio websites that were added to the exhibition.[22] The authors found that although face-to-face interaction was absent, students had the benefit of showcasing their projects globally, connecting with job recruiters, and engaging the wider community.[23]

DISCUSSION AND FINDINGS

The No-Presentation Jury

In spring 2020, a major defining element of the jury was simply discarded – students' oral presentation before the jurors. Students were required to submit digital drawings in the format of a PowerPoint presentation that were graded by the jurors in the absence of students (Figure 2). Students, however, were given the option to voice record a presentation in the interim jury and were required to do so in the final jury. The submission had specific slide numbers, format, and size, which students had to adhere to.

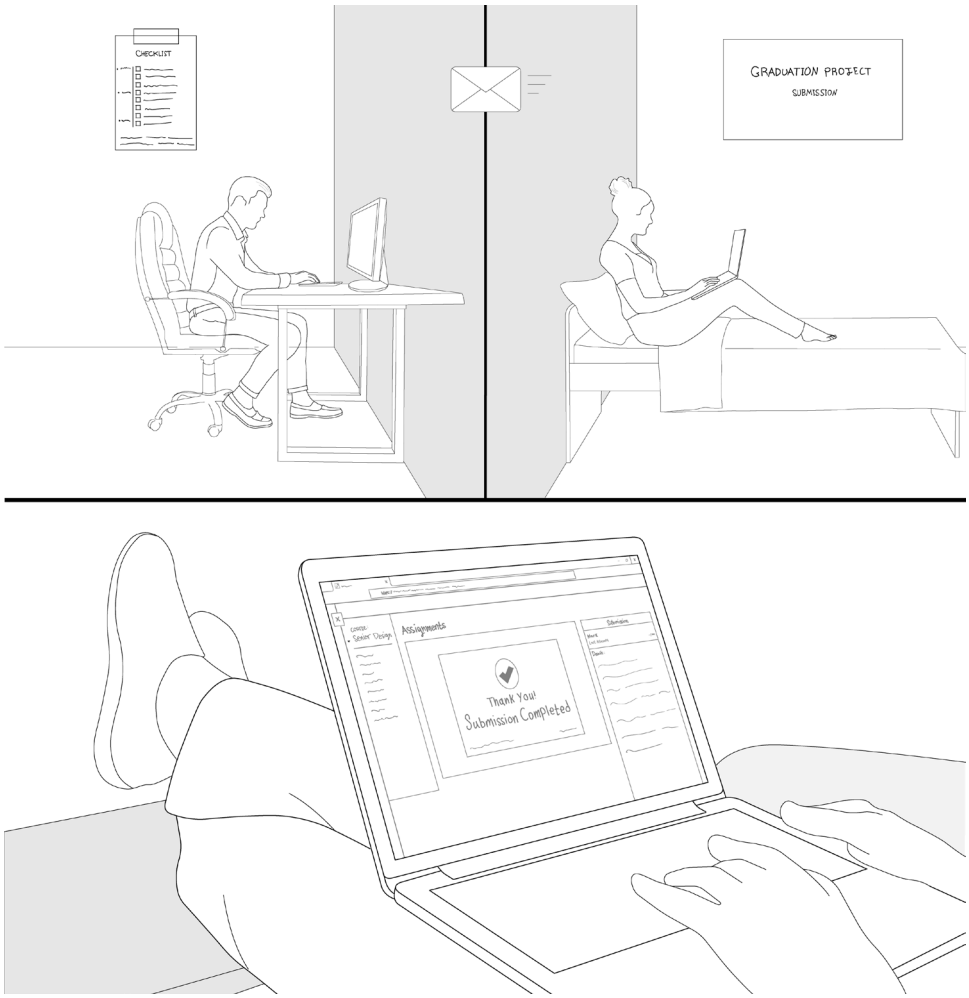

Figure 2. In the no-presentation jury, students submitted digital drawings prepared at home, and instructors reviewed submissions absent students (by Majd Musa)

Most research participants were disappointed to learn that they would not deliver a presentation in the jury. Students wanted to be able to defend their projects, and voice recording over the slides could not serve this purpose. They wanted to make sure that their project received a fair review. They wanted to know the justification for the grade they received and see other students' work to compare with theirs. In the absence of the oral presentation, students exercised less power in the jury than in the traditional jury, in which scholars such as Musa and Webster found the student-juror power relations leaning towards the juror.[24]

While many participants received written comments from the jurors in the interim jury, none got feedback in the final jury. Traditionally, jurors delivered oral feedback after students' presentations. Although, as Musa rightly pointed out, students used the comments from interim juries to improve

their projects but rarely worked on their projects after the final jury, they learned much from the comments and discussions in the conventional jury.[25] In the absence of the traditional discussion, the written feedback became an important learning tool. In fact, when asked whether the jury was a good learning experience, only twenty-five percent of the participants said yes; the rest either remained neutral or disagreed.

Traditionally, the jury provided students with a venue to showcase their projects and feel proud of their accomplishment. But when the oral presentation was eliminated and no posters were pinned on the walls, the sense of achievement was partly lost. Thus, half of the participants thought their work was not recognized, and over one third said their project was recognized only because they shared it with friends and family. Twenty months after graduation, over sixty percent of the respondents still wanted to present their projects on campus.

There was no after-jury celebration of this milestone with peers, friends, and family, no balloons, or flowers. That was discouraging for most students. Thus, one participant commented, "it didn't feel like a jury." Another said, this jury mode "ruined the meaning and fun of the experience." A third respondent commented, "I disliked not being able to present my hard work in front of my family and friends who'd been waiting for this for … years."[26]

The Online Jury

In fall 2020, online juries took place in virtual rooms on Microsoft Teams (Figure 3). This jury mode would be used again in spring 2021, but for students who preferred it over what was supposed to be an in-person jury but ended up a hybrid jury. The online jury gave students the chance to present their work and, at least in theory, defend it.

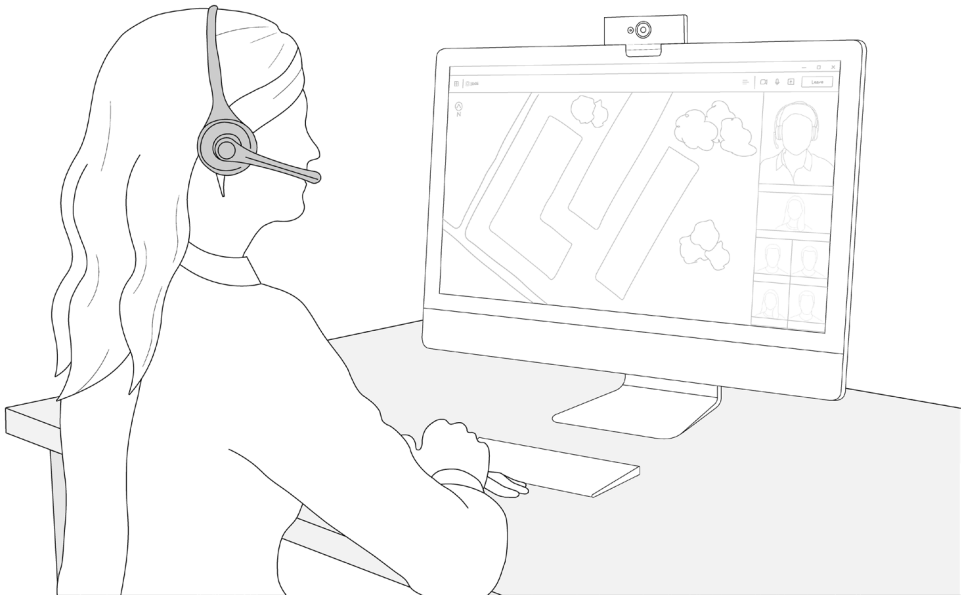

Figure 3. Online juries were in virtual rooms where students delivered presentations and jurors gave critique (by Majd Musa)

The slide format was like that of the no-presentation jury of the previous semester but without the voice recording. Although the slide size was quite large, it was viewed on a laptop or PC screen, which negatively affected the clarity of the details. Half the juries did not utilize any of the available features when giving feedback, which was an issue Alnusairat, Al Maani, and Al-Jokhadar also highlighted in a different context.[27] Two thirds of the juries faced connection-related technical difficulties: synchronizing with team members and jurors, sharing screens, audio and video issues,

and internet interruptions. Such issues were detrimental to students' time management, presentation flow, and self-confidence.

Most participants believed they did not receive adequate time, if any at all, to respond to critique. In fact, participants were divided on whether the jurors could follow and understand the projects. Most participants believed the earlier factors, as well as the lack of body language, caused this evident gap in communication. Miscommunication was troublesome especially that students no longer had the luxury of discussing feedback with jurors later as they did traditionally. This impacted the value of the jury as a learning tool.

One significant outcome of online juries was the shift in student-juror power dynamics. Fifty percent of the participants felt less anxious presenting online. This could be attributed to reasons such as sitting in front of a screen, rather than standing before an intimidating group of jurors, and reading directly from a prepared script. Students could choose whether to turn on their cameras or remain hidden. Those who chose to be on camera believed that would increase their confidence and allow them to connect to jurors better and claim ownership of their project in front of their jurors, colleagues, friends, and families. Those who preferred to be off camera believed that would make them less nervous and allow them to read their script without being noticed, or they simply were too stressed and did not have time to get ready.[28] While students enjoyed the freedom of choosing to be on camera or not, they preferred having their jurors on camera. Participants reflected that not seeing the jurors' facial expressions made them feel less comfortable, judged, and alone, whereas seeing the jurors' reactions made them happy and confident.

Participants believed their projects were recognized because they were able to share the presentations with friends and family. However, some admitted that they were unhappy with their projects receiving less recognition than the peers who attended the jury on campus. The end of the online jury was remarkably underwhelming, only marked by participants receiving a video recording of the jury session. Some chose to attend their peers' online juries, while others left the call to have a modest celebration with a few friends or family or simply sleep.

While fifty percent of the participants rated the online jury experience of Phase I of the project as good, over seventy percent rated the online jury of Phase II as only satisfactory. Possibly that was because of the nature of Phase I of the project and given that this class of students already had the no-presentation jury on a previous design studio the semester before, having a jury – even online – was quite an improvement. Another reason might have been that, unlike Phase II, all the class in Phase I had the jury online. Those who had the jury online in Phase II compared their experience with the experience of their classmates that attended the hybrid jury on campus.

The Hybrid Jury

In spring 2021, students were given the choice to either attend the jury online or on campus.[29] This was the same class that the semester before had to experience the online jury for the first phase of the graduation project. As members of the same team could not always agree on whether to attend online or in person, some juries ended up with some team members attending online and others in person. In addition, some external jurors and students' peers joined the jury online. This resulted in the hybrid jury mode (Figure 4), which had the same deliverables and restrictions as the online jury. But unlike the online juries, the hybrid juries displayed the presentation slides to those joining on campus on large interactive screens. Some students also used physical models to further illustrate their projects (Figure 5). Friends and family were not permitted. However, the jury was broadcasted on Zoom.

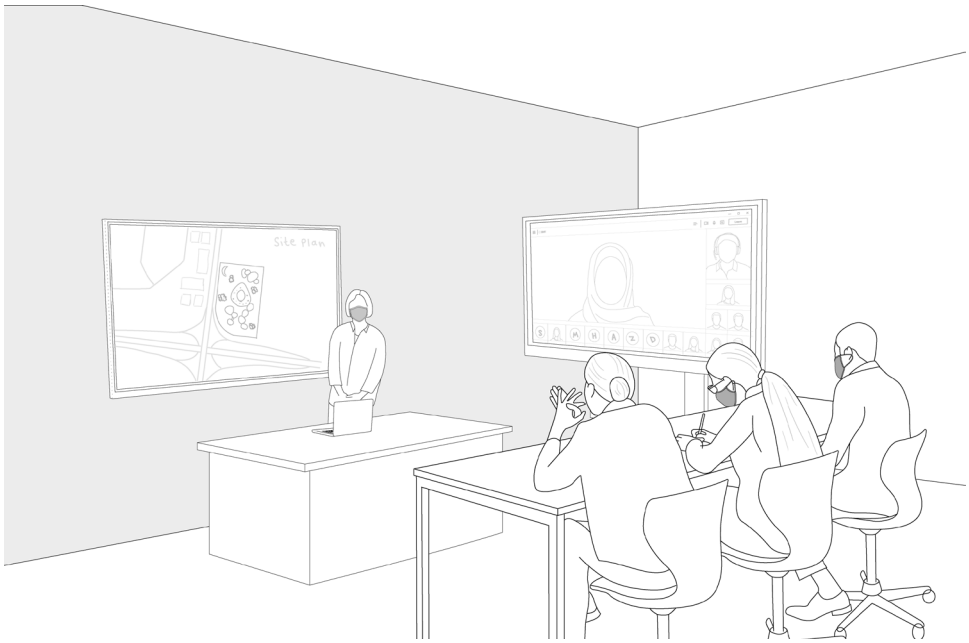

Figure 4. Some team members or jurors attended the hybrid jury in person, others online (by Majd Musa)

Figure 5. Students attending the hybrid jury in person presented models of the projects (by Majd Musa)

Sixty percent of the participants believed that on-campus jurors were able to follow the project better than online jurors. Most participants said they had the chance to respond to some of the comments made in the jury. Most students felt empowered having their jury on campus. Eighty percent agreed that the on-campus jury allowed them to present their project to its fullest potential. They were more motivated, excited, and confident, especially as they presented beside their teammates and were able to perceive jurors' reaction and use body language during the presentation.

Those who attended the hybrid jury in person took videos of their presentations and posted the videos on social media. Having been at home for over a year now, one can understand how valuable this moment was for the students. They were invited to keep printouts and models of their projects to be exhibited in the department. A few select groups were interviewed by the university media, and some of the interviews aired on local TV. Students celebrated with their peers in person. Some had friends

waiting outside the jury room, and the end of their jury was marked by singing and music ringing in the department. Students felt a strong sense of achievement over their projects. Overall, sixty percent of the participants rated their experience as excellent.

The In-Person with Non-Conventional Tools Jury

In fall 2021, the jury was conducted in person. It echoed the conventional mode of the jury but with less visitors, no external jurors, and only few friends, family members, and peers of the presenting team (Figure 6). The same PowerPoint slide format required in earlier modes of the jury under COVID-19 persisted although models were now added. Students would connect their laptops to the large interactive screen in the room where the jury took place to share the screen with their presentation (Figure 7).

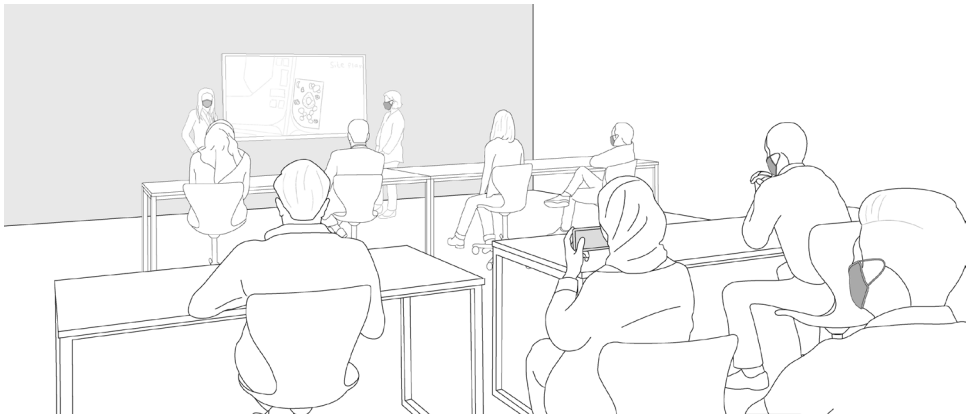

Figure 6. Few audiences attended the in-person jury (by Majd Musa)

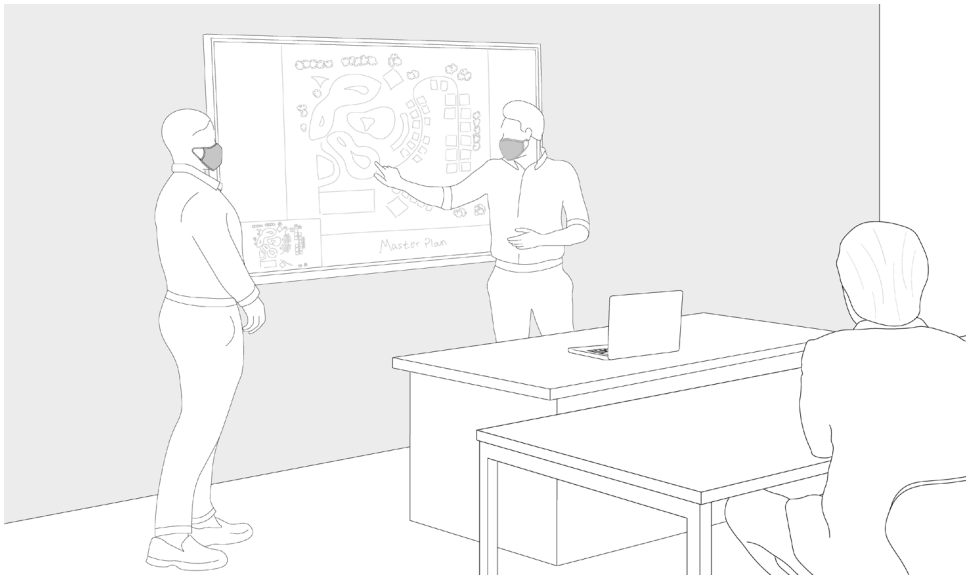

Figure 7. In the in-person jury, students presented their project on a large interactive screen (by Majd Musa)

Students perceived the jury as an empowering setting, reporting similar reasons mentioned by those who attended the hybrid jury in person. However, students were mostly unfamiliar with the smart screen used in the jury. They faced problems connecting the laptop to the large screen, sharing the screen, and using the presentation tools of the smart screen. These issues caused anxiousness and losing one's train of thought (Figure 8).

Figure 8. Students faced technical issues with non-conventional presentation tools (by Majd Musa)

All participants said they felt a sense of achievement. The majority thought their projects were recognized, not least because they presented them in the jury and shared the presentations or recordings of the jury session with friends and family. Students celebrated their achievement with friends after the jury. Not surprisingly, over eighty percent agreed that the jury was a good experience. Despite students' positive experience with this jury mode, some highlighted that it involved spending more time travelling and having less time to prepare the project. Interestingly, these were never reported as issues in the pre-COVID-19 jury. But now that students had experienced other modes of the jury, such issues surfaced and were among the reasons why over thirty percent of participants who had the in-person jury said if they were to be given the opportunity to have the next jury online, they would have taken it. In fact, participants who had the online and no-presentation juries pointed out saving travel time and money and having more time to work on the project as advantages. All jury modes under COVID-19 had the advantage of saving time and money otherwise spent on printing.

CONCLUSION

The four approaches to the jury reflected various levels of confidence in and experience with available technologies, as well as how deeply rooted the jury system was. The in-person with non-conventional tools jury somewhat echoed the conventional jury. The no-presentation jury highlighted the problem of the jury's emphasis on assessment over learning. Because the conventional jury system was too precious to be adapted to the new situation, it was undermined by the elimination of students' oral presentation. The online jury mimicked but could not capture the soul of the traditional jury or achieve its learning goals. The hybrid mode had a good potential to improve the jury, but its potential was not fully achieved. While the completely in-person and online juries and juries that eliminated student presentations, at least in theory, provided students with equitable opportunities, the mode that involved some students in hybrid and others in online juries did not.

At the end, none of the four jury modes matched the traditional on-campus jury and its conventional tools, for the approach was to recreate the traditional jury system using the new tools. Not only did this approach miss on fully utilizing modern technologies, but also it assumed that the pre-COVID-19 jury was perfect, which was untrue. The right approach would be to transform the jury taking advantage of what recent technologies may offer.

The post-COVID-19 jury should not be the same as the pre-COVID-19 jury. The exciting potential of the hybrid jury should be explored in interim juries. Another more drastic approach would be to consider the exhibition as a replacement for the final jury. In fact, most research participants regardless of the mode of the jury they experienced preferred informal discussion of their projects with peers and instructors in an exhibition setting over the jury. The new exhibition setting should be hybrid and use the latest technologies to allow physical and virtual display of student works, thus extending the audiences beyond the campus while allowing the much-needed social interaction.

NOTES

[1] See Kathryn H. Anthony, *Design Juries on Trial*, reprint (Champaign, IL: Kathryn H. Anthony, 1991/2012), xi, 3; Rosie Parnell et al., *The Crit: An Architecture Student's Handbook*, 2nd ed. (London and New York, NY: Routledge, 2007), 6-8; Majd Musa, "Assessment, Learning and Power in the Architectural Design Studio Jury: A Case from the United Arab Emirates," *Archnet-IJAR: International Journal of Architectural Research* 14, no. 3 (2020), doi:10.1108/arch-01-2020-0009, 490.
[2] Musa, 490.
[3] Musa, 490.
[4] The authors are thankful to Ahmad Diaa Semary for his help in preparing the figures for publication.
[5] The authors are grateful to the research participants for sharing their experiences.
[6] As shown in the Discussion and Findings section, the spring 2020 juries had no student presentations.
[7] Anthony, *Design Juries on Trial*; Su Hall Jones, "Crits–An Examination," *International Journal of Art & Design Education* 15, no. 2 (1996): 133-141, doi:10.1111/j.1476-8070.1996.tb00660.x; Helena Webster, "Power, Freedom and Resistance: Excavating the Design Jury," *International Journal of Art & Design Education* 25, no. 3 (2006): 286-296, doi:10.1111/j.1476-8070.2006.00495.x; Helena Webster, "The Analytics of Power," *Journal of Architectural Education* 60, no. 3 (2007): 21-27, doi:10.1111/j.1531-314x.2007.00092.x; Ashraf M. Salama and M. Sherif T. El-Attar, "Student Perceptions of the Architectural Design Jury," *Archnet-IJAR, International Journal of Architectural Research* 4, no. 2-3 (2010): 174-200; Musa, “Assessment, Learning and Power,” 489-502.
[8] Anthony, 34-36, 132-133.
[9] Jones, “Crits,” 133.
[10] Webster, “Power, Freedom and Resistance”; Webster, “Analytics of Power,” 295.
[11] Musa, “Assessment, Learning and Power,” 492-500.
[12] Musa, 501.
[13] Sara Elrawy and Doaa Abouelmagd, "Architectural and Urban Education in Egypt in the Post Covid-19 Pandemic," *European Journal of Sustainable Development* 10, no. 2 (2021): 91-112, doi:10.14207/ejsd.2021.v10n2p91; Naglaa Megahed and Asmaa Hassan, "A Blended Learning Strategy: Reimagining the Post-Covid-19 Architectural Education," *Archnet-IJAR: International Journal of Architectural Research* 16, no. 1 (2021): 184-202, doi:10.1108/arch-04-2021-0081.
[14] Saba Alnusairat et al. "Architecture Students' Satisfaction with and Perceptions of Online Design Studios during COVID-19 Lockdown: The Case of Jordan Universities," *Archnet-IJAR: International Journal of Architectural Research* 15, no. 1 (2021): 219-236, doi:10.1108/arch-09-2020-0195; Duaa Al Maani et al. "Transforming Learning for Architecture: Online Design Studio as the New Norm for Crises Adaptation under COVID-19," *Open House International* 46, no. 3 (2021): 348-358, doi:10.1108/ohi-01-2021-0016.
[15] Ali Asadpour, "Student Challenges in Online Architectural Design Courses in Iran During the COVID-19 Pandemic," *E-Learning and Digital Media* 18, no. 6 (2021): 511-529, doi:10.1177/20427530211022923.
[16] Elrawy and Abouelmagd, “Architectural and Urban Education,” 99-101, 105-106; Megahed and Hassan, “A Blended Learning Strategy,” 186-187; Alnusairat et al., “Architecture Students’ Satisfaction,” 220, 232-233; Al Maani et al., “Transforming Learning,” 350-351, 352-353; Asadpour, “Student Challenges,” 512, 516.
[17] Al Maani et al.; Megahed and Hassan.
[18] Alnusairat et al., “Architecture Students’ Satisfaction,” 226; Asadpour, “Student Challenges,” 524.
[19] Megahed and Hassan, “A Blended Learning Strategy,” 187, 194-196.
[20] Al Maani et al., “Transforming Learning,” 355.
[21] Lina Ahmad et al., "Interior Design Teaching Methodology during the Global COVID-19 Pandemic," *Interiority* 3, no. 2 (2020), doi:10.7454/in.v3i2.100, 170-172.
[22] Ahmad et al, 170-173.
[23] Ahmad et al, 175-176.
[24] Musa, “Assessment, Learning and Power,” 497; Webster, “Power, Freedom and Resistance,” 292; Webster, “Analytics of Power,” 22.
[25] Musa, 500.
[26] Survey responses, February 2022.
[27] Alnusairat et al., “Architecture Students’ Satisfaction,” 226-227.
[28] A few participants also cited their cultural backgrounds as reasons for not having a camera on. Since they could not see or control who was watching the online jury session or who would view the recording of the session, they preferred to be off camera.

[29] By then, COVID-19 situation started to change. Some had already been vaccinated against the disease, and higher education regulators started to put some pressure on educational institutions to gradually go back to campus.

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NO NEED TO PANIC: WHAT THE DIGITAL EXPERIENCE TEACHES US ABOUT TEACHING DESIGN

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INTRODUCTION

Panic quickly set in across the globe amongst those of us in the university community teaching in the design of the constructed environment. New York was hit early and hard by the pandemic, and shifted to on-line learning in March 2020; Parsons School of Design would remain on-line for two semesters. Melbourne similarly shifted to on-line learning in March 2020, and was hit by two years of border closures and six lockdowns, which meant that on-line learning was in place for four semesters. The prospect of transitioning the teaching of design disciplines – which intrinsically deal with the physical presence of things and the social engagements of studio culture – to digital platforms filled us with questions, concerns, and dread. We were, of course, used to routinely incorporating into our teaching — without thinking — sketching, gesturing, and holding models. These automatic techniques each had to be reconsidered in the shift to on-line classes. In making this shift, however, some unexpectedly positive discoveries surfaced regarding the relative fluidity and resistance of on-line learning vis-à-vis its on-campus counterpart, and regarding how teaching through a different medium challenged us to think about different ways of learning. These offered new insights into how our students learn and how we can reimagine learning environments, from the advent of community agreements, to reimagining team-teaching approaches and design reviews, to reconsidering the relationship between media and content in design studios.

FLUIDITY AND RESISTANCE

As architect and educator Christian Gänshirt writes in *Tools for Ideas*, the strength of digital tools are precisely their abstraction and attendant lack of resistance, making them able to become universal machines, able to perform the tasks of a myriad of specialized devices and equipment. This lack of resistance enables their speed in exploring alternatives, and their capacity to enable designs that would be nigh impossible using analogue tools. This lack of material resistance also brings with it an altered relationship to time, space and our perception of both.[1]

The shift to on-line learning, particularly as it pertains to design studios, has come at a cost. Common to a number of observations of the impact of digital learning of design during the pandemic, whether in product design (Parsons School of Design), spatial design (Monash University) or architecture (Swinburne University of Technology), have been difficulties understanding scale, proportion, and materiality.[2] When coronavirus brought about a shift in learning to a fully digital mode, it became easy to neglect the physical.

Yet, for all of these costs, there have been benefits of this shift that are too powerful to dismiss. One of these has been precisely the very abstraction of digital tools in overcoming the resistance of space and material. This has enabled a reconsideration of our relationship to time and space, with ramifications for how we teach and how we conduct design reviews.

Space: The Resistance of Campus Buildings

The shift to on-line learning in March 2020 offered the potential for a new fluidity of learning. On-line classes could be accessible to those for whom coming to campus would be impossible, whether due to border restrictions or lockdowns, and could be asynchronous to fit the schedules of students that were now located in disparate parts of the world.

Architecture at Swinburne commenced in 2018 and is rapidly growing. This growth presents a real challenge for our physical space, which is becoming an increasingly rare commodity. Prior to the pandemic, our physical space limitations constrained our teaching ambitions in Construction 3, which is a big course with multiple sections that explores ecologically sustainable design. Our aim has been to teach the sections simultaneously, to enable a collaborative approach of a team of experts, each with different strengths, and have group critiques and workshops that make use of the expertise of the team. Yet, as of 2019, it had been impossible to do this effectively, either we got the spaces we wanted without the simultaneous schedule, or we got the simultaneous schedule without adjacent spaces to make it meaningful.

The shift to on-line teaching in 2020 offered an opportunity to finally put our aspirations to the test. Once we scheduled the class with simultaneous sections, digital teaching tools enabled us to fluidly respond to the dynamics of the course. We merged all the sections to introduce the teaching team and projects. We coupled sections for in-class workshops and digital pin-ups and pulled them apart again for progress discussions. Interestingly, 2020 brought us better results and a better overall experience compared with 2019. Apart from reconceptualizing the projects for online teaching, the real contributor to this was the fluidity of digital space, which enabled the teaching team to better leverage our individual strengths, and manipulate the class format.

In the second half of 2021, with the Australian vaccination campaign finally well underway, we anxiously sought to return to campus, and thus planned for on-campus teaching. Our intent was to replicate what we had done digitally in 2020. Although scheduled to teach in “flexible teaching spaces”, we were stymied by rather inflexible resistance, both from buildings and bureaucracy. When another lockdown hit just as the semester was starting, the return to the fluid space of on-line learning was surprisingly consoling.

Time: Asynchronicity in Design Reviews

While video conferencing worked well for summative final reviews, it compromised how we prefer to conduct formative mid-semester reviews that remain open to multiple simultaneous conversations among critics and students. For the BFA Product Design and MFA Industrial Design programs at Parsons, we developed a remote asynchronous format for midterm reviews during the online year of instruction.

Over a period of one week, critics from around the world each viewed five-minute student video presentations, reviewed work submitted to digital whiteboards, and submitted written feedback, as in the example in Figure 1.

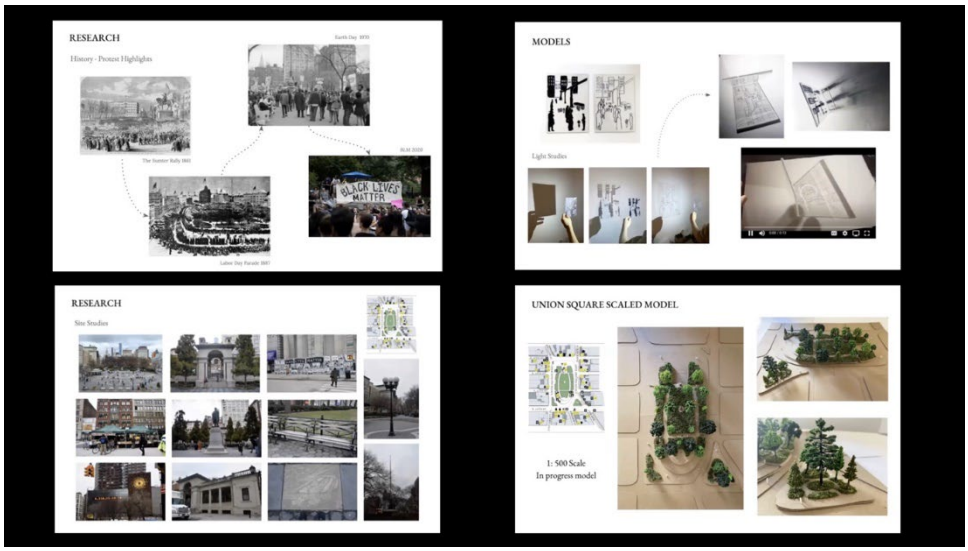

Figure 1. Excerpts from Goksu Piskinpasa's midterm video presentation.

This approach provided advantages that are not possible on campus. Since a global audience of critics could review the student work on their time, it was easier to include a more diverse group of busy professionals across different time zones, as well as inviting three times the number of critics that we could normally host on campus.

We tailored each critic's expertise to the student work they reviewed. For example, an architectural historian in New Zealand was invited to review a Product Design student's historically reflective installation for Union Square since she had previously published a book about the socio-political history of the site.

In addition, students were each assigned to review one of their peers using the same feedback form provided to critics and understood that they would be assessed on the quality of their feedback, as if being in a design team. Additionally, students were assigned to complete a written analysis of the feedback they received, as well as self-assessments of their own progress.

The feedback forms included several questions derived from the course learning outcomes to frame the critic's feedback, as well as stimulate greater self-reflection in students about their learning experience and assessment of their own performance, as shown in Figure 2. Interestingly, the student self-assessments consistently aligned with the assessments by their three professional critics and one peer critic.

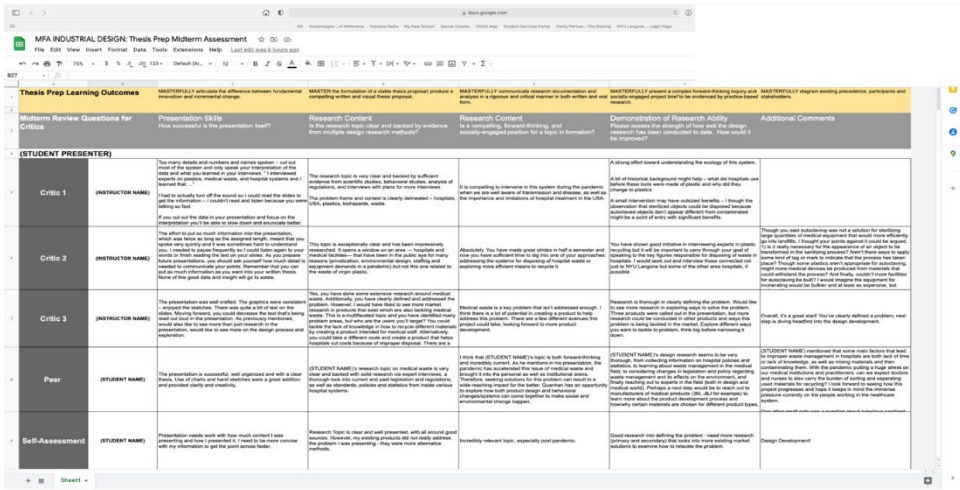

Figure 2. Asynchronous Midterm Assessment Feedback.

This asynchronous review format was first used for the MFA Industrial Design Thesis Preparation course. It was so successful that the graduate students requested that their studio instructors adopt it the following spring, so we continued to use it after returning to on-campus instruction.
Instructors, critics, and students have shared that they believe the quality of critical feedback in written form has been superior to their experiences for in-person formative reviews. Use of the review format during the last two years tentatively demonstrates greater student comprehension not only about what they are learning, but more importantly, how it matters to the distinctly different ways that each student aspires to practice design.

TOWARDS PLURALIZED LEARNING: VISUALITY, TACTILITY AND SOCIABILITY

In *Frames of Mind*, published in 1983, developmental psychologist Howard Gardner argued against a single definition of intelligence. Rather, thinking about a wide gamut of human endeavour and the intellectual faculties which enable them, Gardner proposed intelligence was simultaneously a quality of humans, a way in which we differ from one another, and the way in which we carry out tasks. Gardner defined intelligence thus, "An intelligence is the ability to solve problems, or to create products, that are valued within one or more cultural settings…"[3] What would become known as the Theory of Multiple Intelligences proposed seven types of intelligence: linguistic, musical, logical-mathematical, spatial, bodily-kinaesthetic, interpersonal, and intrapersonal. He would later add an eighth: naturalistic. Writing in 2011 on the implications of Multiple Intelligence Theory, Gardner argued for a "pluralized" approach to education that utilised "multiple modes of delivery" in order to make use of multiple intelligences.[4]
The shift to on-line learning increased our awareness of the hitherto unnoticed multiple ways by which students learn, as it offered us surprises, whether teaching CAD or design studio.

Multimodal Learning of Digital Design Tools

People learn in many different ways that take place in simultaneous cognitive, physical, emotional, sensorial, and socially interactive experiences. The absence of physical material resistance for advanced modelling lessons at Parsons School of Design required reimagining how it could be sustained otherwise for online instruction. As Malcolm McCullough notes in *Abstracting Craft: The Practiced Digital Hand*, historically, the direct physical workability of a material medium defined its affordances and constraints for creative expression. Yet, as Christian Gänshirt notes, digital processes "… no longer offer any material resistance to the designer, but they do offer mathematical resistance…."[5] Despite the absence of the physical material resistance in computational design, McCullough claims "materiality is… pivotal to the question of craft in the electronic realm".[6] In short, computational processes modify symbolic notation and data structures nearly continuously, akin to physical materials, and thus seemingly enable infinite possibilities for creative expression.
One online lesson taught students how to simulate the movement of foldable geometry, like origami, in CAD to design, develop, and execute laser cut and 3D printed kinetic models, such as those in Figure 3. This assignment was not successful during the online year. Too many students failed to absorb and apply the advanced CAD lessons, but all students succeeded to a high degree the following year on campus. Rather than reducing the complexity of lessons after failed results during the online year, the same assignments combined with new and more advanced exercises counterintuitively showed significant improvement in student learning the following year on campus.

Figure 3. 3D printed and laser scored kinetic model samples

One key difference may be that having a multimodal instructional format, which followed-up asynchronous video lessons with in-person work sessions, was a better match for *the nature of the content.* Students that learn well exclusively through visual and auditory experience, and English-as-second language students could repeat video lessons as needed on their time, and students that learn more easily in social groups or through tactile interaction grasped these lessons better during in-person class time.

The success of more advanced lessons may also be contingent on students becoming more *within the work* of a parametric environment by using CAD tools topologically and geometrically, as well as using the software multi-dimensionally. The result is a richer, denser, digital repertoire combined with greater psychological engagement for creative expression. These lessons seem to have inspired and empowered students rather than intimidating them and undermining their creative confidence.

Self-Reflective Learning and Community Agreements in Design Studios

If, as neuroscientists Jaak Panksepp and Lucy Biven write, "… the neocortex — the source of our human intellect — is the servant of our emotional systems," then neither intellect nor emotions can be ignored for instruction and learning.[7] During the year of remote instruction at Parsons, community agreements were used for the first time out of concern for the alienating experience of videoconferencing communication and social isolation. Use of community agreements for a course can help stimulate students to become more conscious about their own learning individually, as well as how they will be learning and working together as a group. It can also alter the relationship between the instructor and students by establishing one from the first-class day that is open to discussing their learning experience while showing attention and respect for each student. What they learn matters, but they should understand why on their own terms rather than first being offered a syllabus, like a learning contract filled with policies, protocols, and rubrics, that tells them what they're learning outcomes will be. One MFA student shared that the community agreement was profound for him, and he would adopt this for courses he teaches. (Figure 4)

As shown in Figure 4, one tenet of our community agreement states that “We are not here to compete against one another, but to mutually support greater learning together. To do so, our primary goal is not to have the best idea in the room, but to support a peer's idea to be the best.” Students were reminded of this goal at opportune moments during the semester such as conducting round robin formative reviews.

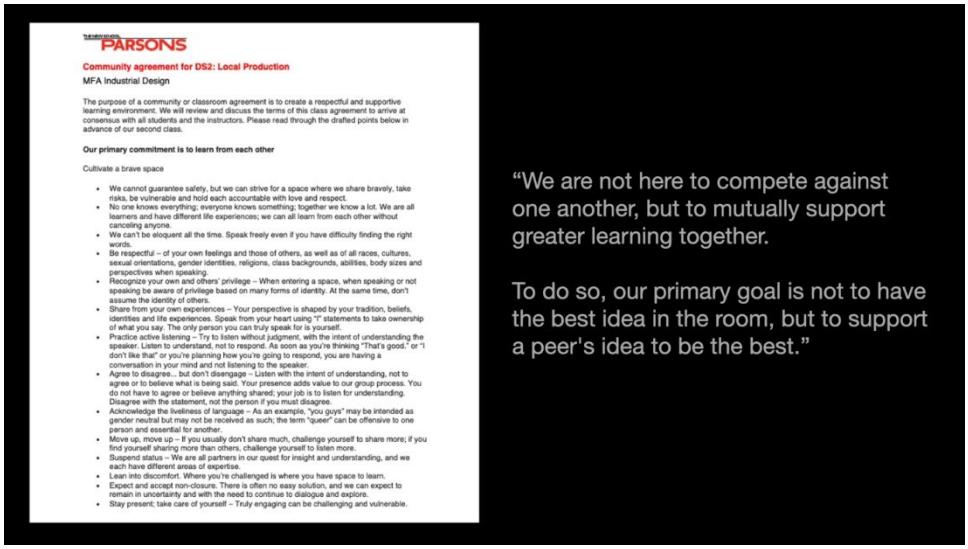

Figure 4. A Community Agreement used in an industrial design studio at Parsons.

Observing general improvement in student learning across five undergraduate and graduate courses tentatively demonstrates this resulted in greater student comprehension not only about what they are learning, but how it matters to them. In short, it appears to have strengthened intrinsic motivation for their education.

Sensorial and Digital Approaches vis-à-vis Remote Learning

In Spatial Design at Monash University, the pandemic revealed that the fluidity of the digital tools alone does not necessarily lead to successful learning. In fact, learning remotely seems to work better when it is counterbalanced by experiential phenomena.

The 2nd year studio had two 6 week-long projects. Focusing on temporality, materiality and construction, the *Fleeting Space* project asked students to design an immersive installation utilizing sunlight, air, and sound using an experimental, hands-on making process, while the *Transformer* project asked students to design a kinetic structure for the Human Rights Film Festival in the State Library in Melbourne using digital design tools. Initially, because the remote learning removed physical demonstration and interaction with students' work, the digital process of the *Transformer* project seemed to lend itself more to remote learning, whereas the *Fleeting Space* project seemed problematic as it offered an alternative that could not be easily abstracted digitally.

For *Fleeting Space*, students used ice, cellophane, light-sensitive chemicals, and coloured powders to create experiential maps communicating qualitative data on the temporal atmosphere. For example, one student studied temperature, humidity, and air movement to understand the varying intensities of the musky scent of a garden after the rain, as shown in Figure 5. Her installation was made of garden soil and fog which was placed near an open window to aerosolize the scent molecules, as shown in Figure 6. The installation was communicated through a combination of photos, videos, mappings and drawings. Despite the student’s limited access to materials and the limitation of communicating the project using only visual means, the project put up a fight against these restrictions and conveyed a sense of curiosity through highly experimental approaches.

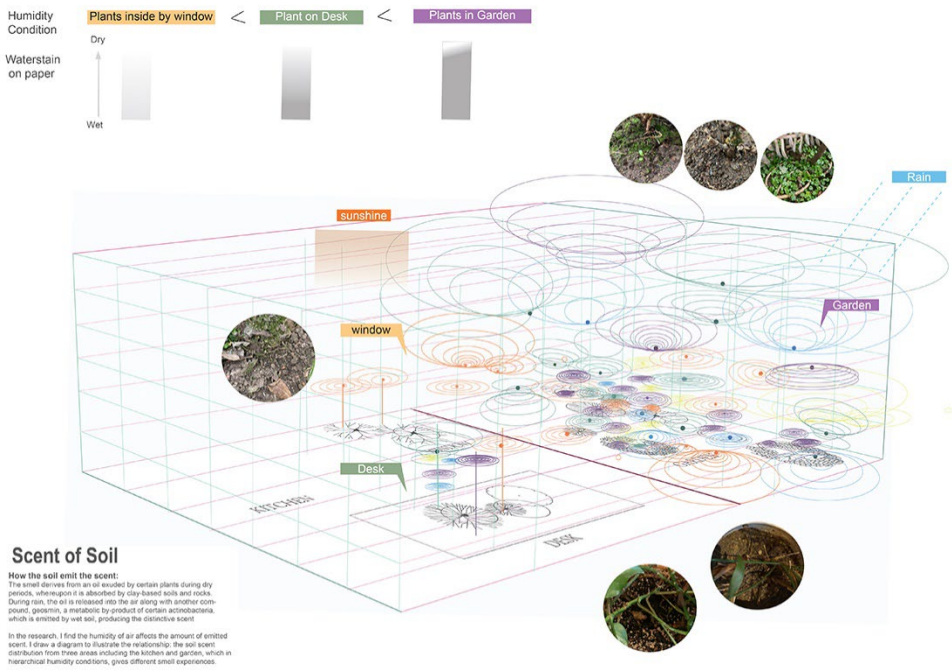

Figure 5. Atmospheric mapping by Zihan Zhou.

Figure 6. Scent installation by Zihan Zhou.

For *Transformer*, on the other hand, students started by researching the site and client online. They made scaled physical models to explore a kinetic system and developed them further using Rhinoceros software. Unlike *Fleeting Space* which exposed students to physical design tools, the *Transformer* relied on digital tools for its development. Despite repeated instruction on using measuring tapes and the body to understand spatial experiences, digital tools were not adequate for students to learn about scale, materiality, and structure.

Upon reflection, *Fleeting Space* seemed more successful than *Transformer* in terms of quality of work produced. It seems that especially for inexperienced students, the multisensory approach that Fleeting Space entailed may be critical in maturing their understanding of spatial experiences. One student anecdotally testified that working with her hands and physical design processes made her aware of her

thought processes and attuned her to her environment, and thus better enabled her to expand her ideas than digital design tools did. In *Tools for Ideas*, Christian Gänshirt argues that multi-sensorially engaged design processes evoke imagination.[8] In *Analogous and Digital,* Otl Aicher writes that the use of hands is linked to the plasticity of thought.[9] The haptic design tools for *Fleeting Space* guided students to *feel* the spatial phenomena and evoked imagination to design complex atmospheric experiences, as demonstrated in Figure 7, whereas *Transformer's* digital fluidity aligned too much with remote learning, and lacked the multi-sensorial nature of *Fleeting Space*.

Figure 7. Light and shadow installation by Natkanok Onratn.

CONCLUSION: THE INSIGHTS AND CHANGES THE EXPERIENCE BROUGHT

Our experiences with remote teaching during the pandemic left us with a number of lessons regarding the relative fluidity and resistance of digital teaching and learning, and the different types of learning. First though, it must be said that in reflecting on our experiences, it is clear that one size does not fit all; the type, size and culture of an institution impacted how the pandemic was experienced, and what discoveries we can bring forward from it. On one hand, we found that the fluidity of digital tools can offer desirable benefits with regards to time and space. Asynchronous design reviews, while being foisted upon us by the pandemic, proved so successful at Parsons that their use has continued through the shift back to campus. Teaching in digital space also offered a flexibility to adjust teaching structures in ways that might otherwise be challenging to do in physical space. On the other hand, the online experience highlighted the necessity for multimodal approaches that are the hallmark of the design process. While teaching digital modelling on-line offered aural and visual learners the benefit of asynchronous demonstrations that could be viewed repeatedly, it also highlighted the need for social and tactile learners to learn in-person. While community agreements offered a way of addressing the isolating experience of videoconferencing, amongst graduate students they had a wider benefit of increasing student engagement. And, although we may have thought that digital media

would work best in a digital learning environment, we were reminded that a counterpoint from physical reality and embodied experience is not only necessary but offers productive resistance.

NOTES

[1] Christian Gänshirt, *Tools for ideas: an introduction to architectural design* (Basel; Boston; London: Birkhäuser, 2007), 186-95.
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[4] Gardner, *Frames of mind: the theory of multiple intelligences*, xvi.
[5] Gänshirt, *Tools for ideas: an introduction to architectural design*, 190.
[6] Malcolm McCullough, *Abstracting craft: the practiced digital hand* (Cambridge, Mass.: MIT Press, 1996), 213.
[7] Jaak Panksepp and Lucy Biven, *The archaeology of mind: neuroevolutionary origins of human emotions*, 1st ed., Interpersonal Neurobiology, (New York: W. W. Norton, 2012), 103.
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[9] Otl Aicher and Wilhelm Vossenkuhl, *Analogous and Digital: Writings on the Philosophy of Making*, trans. Michael Robinson, 2nd ed. (Berlin: Ernst & Sohn, 2015), 22.

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THE WISE PROJECT: IMPROVING UNDERGRADUATE INSTRUCTION IN WRITING AND COMMUNICATION

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INTRODUCTION

Writing is central in students' development of academic language, critical thinking, and reasoning in the disciplines. Despite its importance for student learning, teaching writing is a complex and difficult skill. Many university instructors have little training or expertise in writing instruction,[1] which may result in limited instructional support for students' writing development. To support students' writing development, it is crucial for instructors to develop strategies to address the challenges students face in their writing across the curriculum. Graham[2] stressed the importance of a coherent vision and concrete strategies for teaching writing in and across classrooms and content areas. This paper explores a pedagogical approach based on best practices for writing across the curriculum (WAC) to address the complexity of writing instruction. The pedagogical approach integrates: (a) a common rubric for assessing student writing; (b) digital resources integrated into the learning management system for instructors to scaffold and assess students' writing assignments; (c) digital student resources to support writing development.

The complexity of writing in college

Writing is one of the most challenging skills to develop. The act of writing is complex and multidimensional. It involves multiple processes related to cognitive and affective factors and is shaped by the rhetorical situations in which it takes place.[3] Given the complexity of writing, students' writing development requires ample writing practices, opportunities to engage in various writing tasks, and continued support at the curricular and instructional level. Students' writing development is closely tied to their exposure to and experiences of writing opportunities, practices, and community resources and support.[4] The complexity of writing and writing skills development, coupled with the importance of writing in students' college and career success, attests to the need for successful and sustained instructional support across the curriculum.

At the college level, students are expected to develop proficiency in writing with diverse audiences within and outside their disciplines.[5] Beyond first-year composition and writing classes, content area courses and disciplinary practices create distinct rhetorical situations that require students to be well-versed with disciplinary norms, expectations, and literacy. Disciplinary literacy requires students to understand the specific practices of the content area in which the writing occurs. For example, writing in a literature class is different from writing in an engineering or criminal justice course. Students need to understand the nature of inquiry in the discipline, what constitutes "evidence," and the details of relevant genres, for example. The differences in disciplinary literacy add to the complexity and the

multidimensionality of writing as students develop specialized knowledge and skills to communicate effectively within their disciplines. Thus, it is crucial for faculty to help students develop writing and disciplinary literacy skills for college and career success.

Issues in undergraduate writing

Challenges of developing writing skills in college are often exacerbated by lack of coherent pedagogical framework for undergraduate writing, inconsistency in writing expectations, practices, instructions, and feedback beyond first-year writing classes, and lack of support for students with disparate writing experiences and diverse cultural, educational, and linguistic backgrounds. These challenges manifest in three different levels—student level, instructor level, and curriculum level.

Student-level challenges

US students entering college are underprepared for academic writing.[6] As many students in the United States have shown poor performance in writing skills over time, the National Commission of Writing[7] has declared writing as a neglected skill. As a complex, dynamic process, writing is simultaneously shaped and bound by cognitive characteristics and capacity and affective facets of individual writers.[8] Thus, both cognitive and affective constraints students encounter in their writing hinder their writing skills development. Cognitive and affective factors are dependent on each other. Students who are cognitively challenged by the writing tasks demands often feel anxious, unconfident, and unmotivated to write. Low self-efficacy, in turn, inhibits cognitive processing and adversely affects writing performance and outcome.[9] Providing writing resources and instructional support can help reduce the cognitive and affective constraints students face when writing in their disciplinary courses.

Instructor-level challenges

An ongoing challenge to the writing across the curriculum effort has been disciplinary instructors' lack of time for planning and providing quality writing instruction in their disciplinary courses.[10] Many faculty members teaching disciplinary courses are concerned about the additional workload for teaching writing and developing writing resources for their students.[11] As time devoted to writing instruction would reduce the limited course time available for content, instructors typically prioritize disciplinary knowledge and thinking as the primary learning objectives for their courses rather than writing instruction.[12] Even when instructors wish to incorporate writing instruction, most have little training or expertise in writing instruction *per se.*[13] Thus, they lack the pedagogical knowledge critical for developing effective writing assignments, providing meaningful feedback, and scaffolding student writing.[14] These challenges must be addressed for students' academic writing and disciplinary literacy development.

Curriculum-level challenges

In most universities, writing instruction is delivered through a campus-wide lower-division composition sequence and upper-division writing requirements provided by the disciplines. However, a well-documented phenomenon is students' failure to transfer what they have learned in first-year composition classes to their subsequent coursework.[15] Beyond composition programs, most majors lack a coherent, organizing structure for writing instruction despite its importance for student learning.[16] A lack of cohesive structure for teaching disciplinary writing leads to inconsistent writing expectations and standards across classes within students' majors. Using common evaluative standards and pedagogy creates a more cohesive writing curriculum which has been found to support growth in student writing.[17]

To address these challenges, we developed a pedagogical approach that incorporates three components: 1) distributing writing instruction throughout the undergraduate curriculum, 2) using consistent evaluative standards and scaffolds for faculty and students, and 3) using digital tools to scaffold writing instruction. In what follows, we present the rationale for our pedagogical approach to writing instruction in undergraduate disciplinary courses.

THE WISE PROJECT

The rationale for the project

The WISE (Writing Improvement for Students in Education) Project is a pedagogical approach designed in response to the multi-layered challenges discussed above by providing instructors and students writing resources and support. Specifically, the instructional design of the project targets three primary issues in undergraduate writing instruction: 1) the difficulty in providing timely and consistent feedback on student writing throughout the discipline or academic program; 2) instructors' limited knowledge of writing pedagogy, and 3) students' limited use of evidence-based writing strategies. These were addressed by creating a digital intervention delivered through the college's learning management system. It scaffolds the evaluation of student writing using a common rubric within the major, provides instructors with resources to support writing assignments and pedagogy, and supplies students with a set of digital mini-lessons and resources to scaffold their writing.

The theoretical sequence linking the WISE Project to student outcomes flows from existing research on effective writing pedagogy[18] to improve undergraduate students' writing performance and efficacy in writing. The WISE Project encourages undergraduate instructors to provide enhanced and consistent feedback on student writing, learn to better design writing assignments, promote peer-review, support diverse learners, and maintain academic integrity with ready-to-use digital resources and video tutorials. At the same time, undergraduate students use short video tutorials to learn and practice evidence-based writing strategies aligned with the writing process and the rubric to support their writing. The implementation of the WISE Project may result in the following outcomes: increased teacher knowledge of writing pedagogy and its evaluation and greater student self-efficacy, motivation, and strategy use.

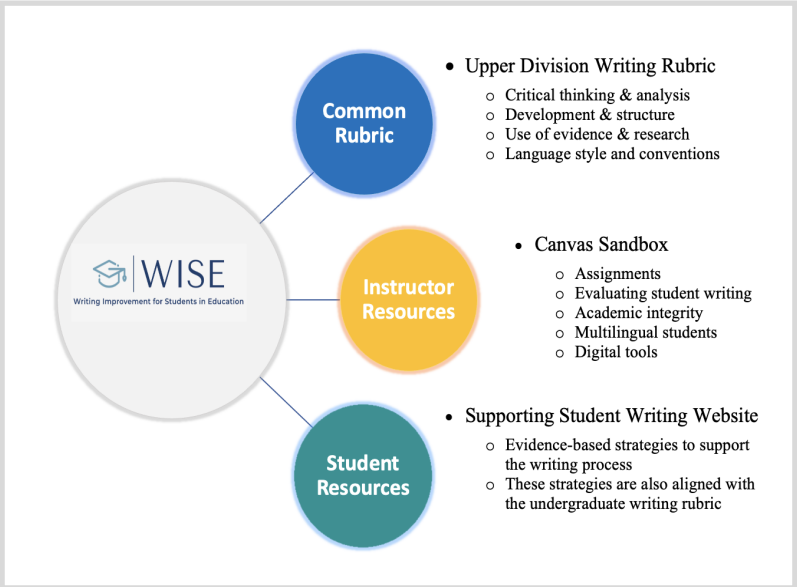

Figure 1. The Wise Project

The pedagogical components

The WISE Project is aligned with the WAC principles of providing sustained writing support to students beyond writing courses throughout their major by promoting consistent and fair assessment, equitable feedback, and high expectations for student writing. The three core components of the project are described in detail below.

1. **A common rubric for assessing student writing.** Using a common rubric enables instructors to establish greater coherence in their understanding of disciplinary writing, allowing consistency across the major for instructors' expectations for student writing and its evaluation, thereby providing students with consistency in the assessment criteria and feedback. Despite a shared vision about disciplinary writing, what constitutes good writing also reflects task demands (such as length of the assignment or on-demand vs. time given), genre, and audience. Thus, we developed a core rubric that reflects disciplinary writing standards and a set of genre-specific rubrics that are better aligned with each assignment.

2. **A set of digital tools for instructors.** The digital tools are provided through Learning Management Systems (LMS) such as a Canvas sandbox course containing rubrics, sample assignments, and resources to scaffold and assess students' writing assignments. These resources can be imported into instructors' courses, thereby reducing the workload of writing instruction. The additional workload associated with teaching writing has been one of the main concerns among faculty members and a significant challenge for many WAC programs.[19] The WISE Project's design and development of digital tools respond to this concern. In addition, professional development for instructors on using and modifying the common rubric and digital resources has been provided through short video tutorials. Ultimately, using these tools should enhance instructors' efficacy and result in better instruction which consequently will benefit students.

The Canvas course sandbox that we have created contains the following six modules:

1.*Evaluating Student Writing*. This module contains general and task-specific rubrics that instructors can easily import into their own courses. The module also includes a video tutorial and documents providing an overview of the rubric and step-by-step instructions on how to import it to their course and link it to their writing assignments. Also included are a short video tutorial on how to provide effective feedback to students and downloadable handouts containing sample comments and sentence frames that are aligned with the rubric's criteria and reflect varying degrees of mastery.

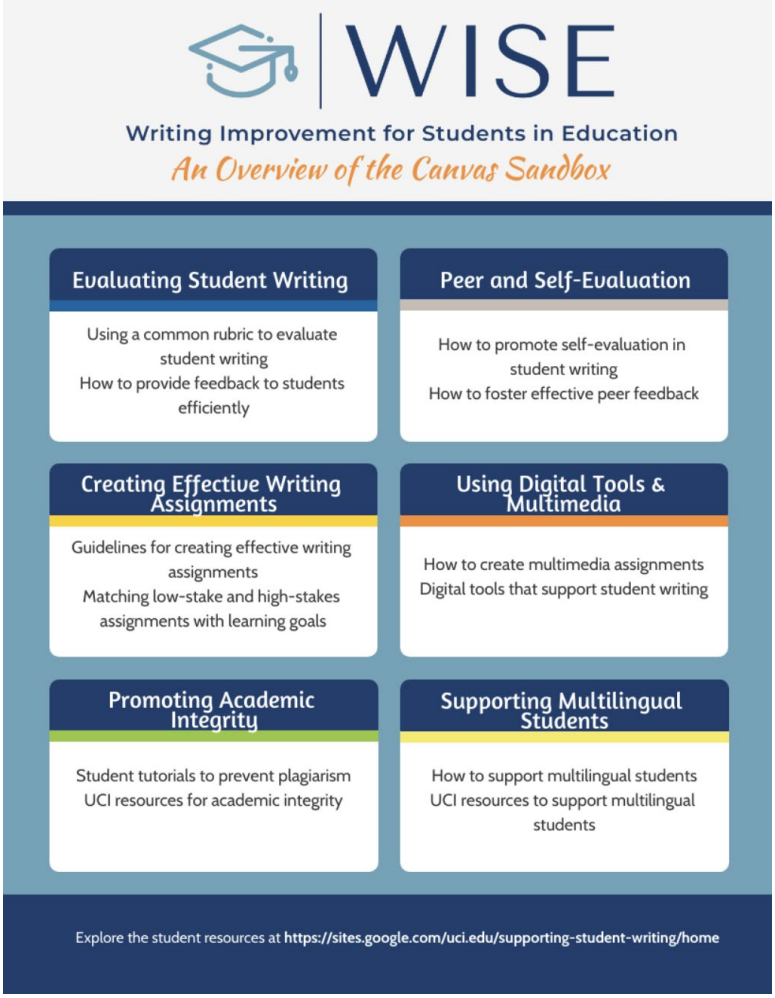

Figure 2. Canvas Sandbox for the WISE Project

2. *Peer and Self-Evaluation*. This module includes a set of rubrics to support peer review and a self-evaluation survey that can be easily imported into instructors' Canvas courses. We have developed several evidence-based peer-review activities such as *What I Really Mean Is*, or *I Believe, I Don't Believe*. The model also contains a video and downloadable document that provide an overview of peer-review and self-evaluation and step-by-step directions on how to import the resources into their classes.

3.*Creating Effective Writing Assignments*. As many disciplinary instructors have little training in writing instruction, this module contains videos and downloadable documents that provide guidance in creating effective assignments and presenting assignments with clarity to students. It also includes guidance on matching high-stakes and low-stakes assignments with their desired student learning outcomes. For example, a fifty-word paper responding to a targeted question encourages students to concentrate on a single, focused issue, consider the essential points to make, and prepare for class discussions.

4.*Using Digital Tools & Multimedia.* This module consists of resources to help instructors incorporate Universal Design for Learning principles into their course to increase student access, engagement, and opportunities to demonstrate their learning. It incorporates videos and downloadable documents that provide guidance in how to use Canvas tools and discussion boards to enhance student connectedness and existing software (such as Grammarly or Ref-n-Write) to support student composition. Also provided are examples of multimedia assignments, such as creating graphic novels, podcasts,

websites, infographics, and videos to demonstrate their knowledge and links to free software for students to complete these assignments.

5.*Supporting Multilingual Students*. Considering that multilingual students encounter unique challenges in disciplinary writing, this module offers video tutorials and downloadable handouts to support their writing. Instructors are presented with an overview of the diverse learning needs that these students may experience, along with best practices and approaches for supporting multilingual students. The module also includes downloadable documents describing resources available on campus to support multilingual students, as well as the links to access campus resources.

6.*Promoting Academic Integrity.* Rather than reactively responding to plagiarism, this module includes an assignment that requires students to submit their certificate of passing the Indiana University Plagiarism Tutorial (plagiarism.iu.edu). It contains a step-by-step tutorial on how to import the Preventing Plagiarism tutorial to their courses and downloadable handouts describing campus resources for academic integrity and how to access them.

3. **Student Resources.** Student resources are provided in the form of a website that contains short videos and pdf handouts of strategies to support writing development (aligned with both the writing process and the common rubric). The goal is to illustrate and emphasize the value of writing for students' success in their academic career and beyond and increase student writing self-efficacy. Student self-efficacy may be promoted with "instructional activities that give students choice, encourage strategy use, provide for self-evaluation, and change assessment context."[20] The student resources website is designed to cater to students' needs while considering these principles for fostering self-efficacy and self-regulation.

The student resources website has two major components designed in form of web page tabs:

1.*Mastering the Writing Process.* This web page tab provides students with an introductory overview of the writing process as a whole, as well as specific information about each of the six stages of the writing process (*planning, goal setting, drafting, evaluating, revising and editing*[21]). Lessons for each stage of the writing process can be accessed using a dropdown menu. Each lesson consists of evidence for its significance and evidence-based strategies for its implementation. For example, the *planning* strategy's webpage features a short video with accompanying downloadable notes providing research-based evidence for its importance for effective writing and several brief video tutorials and downloadable handouts on how to implement *planning* strategies.

2.*Mastering the Rubric.* This tab provides an overview of the writing rubric and tutorials about each of the four criteria in the rubric. For the WISE Project, we adapted UCI's Upper Division Writing Rubric to the disciplinary standards of Education Science and their different types of writing assignments. The *Mastering the Rubric* tab on the student resources website consists of four lessons aligned with the four rubric criteria organized in form of a dropdown menu: *Critical Thinking & Analysis, Use of Evidence & Research, Development & Structure, and Language & Style Conventions*. Each lesson has short video tutorials and downloadable handouts presenting an overview of the criterion and link evidence-based strategies from the writing process to that criterion.

These pedagogical components of the WISE project provide undergraduate instructors with the support they need to provide writing instruction throughout the curriculum without placing heavy burdens on their time. Our initial pilot of the WISE project implemented in UCI's School of Education shows potential, as the participating instructors found the writing resources beneficial to their pedagogical practices and their students' writing development. The findings of the pilot study suggest that creating a rich set of digital resources to support writing instruction and assessment has the potential to improve writing instruction across the curriculum while still offering content instructors flexibility in their adoption. It is noteworthy that the instructors who piloted these resources as part of the WISE Project found them easy to use, helped them be more consistent and equitable in their feedback to students, and believed their students improved in writing as a result.

While the WISE Project was developed to help all undergraduates with their writing skills, we are especially mindful of the importance of meeting the needs of populations, such as underrepresented minority students, first-generation, and low-income students. The supplemental writing resources can provide a much-needed support to these students in their disciplinary courses by demystifying the writing process and providing richer learning opportunities, and guided writing practices. Scaffolding student writing throughout the undergraduate curriculum, from their introductory composition classes to upper-division writing classes, is considered a best practice that may be particularly helpful for underserved students who disproportionately matriculate lacking the writing skills required for college success.[22] Given the importance of writing for college and career success, providing support to these students is a crucial mission towards equitable education.

CONCLUSION

The WISE Project is an initiative to support writing development of students beyond first-year writing instruction and in disciplinary courses. Curriculum plays important roles in students' writing development.[23] The multidimensional facet of writing development requires a cross-curricular approach that promotes sustained writing support, clear objectives, and expectations for writing development, and consistent and coordinated effort to improve students' writing skills across classes and content areas. Thus, it is crucial for disciplinary instructors to develop strategies to address the challenges students face in their writing across the curriculum.

As writing plays an integral role in students' learning, the WISE project seeks to promote sustained instruction in writing across the curriculum, create opportunities for a wide range of writing experiences, and form a community of faculty around effective teaching of writing. The effort to improve writing instruction across the curriculum is an important agenda of equitable education. The adoption of a WAC-based program, such as the WISE Project, can foster more equitable education throughout a major's course offerings by promoting consistent and fair assessment, equitable feedback, and high expectations for student writing. This endeavor is particularly important in a contemporary educational context where a growing number of multilingual writers and marginalized students are striving to become better writers and communicators. We believe that creating a rich set of digital resources to support writing instruction and assessment has the potential to improve writing instruction across the curriculum while still offering instructors flexibility in their adoption.

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SKETCHING AS A DISCURSIVE TOOL FOR CONTEXTUAL RESEARCH

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INTRODUCTION

Sketching is taught to students in different disciplines related to design, such as art / architecture / engineering, as part of the design studio or technical drawing courses, or as an elective or compulsory course on its own. These courses which are generally designed with the aims of gaining the habit of sketching, improving sketching skills, and using sketching as a tool of thinking in the -early stages- design process, are mostly experimental due to the practical nature of the act of sketching. In the studies examining the sketching education, [1] authors (generally the instructors of the courses) researched differing modes of instrumentalization of the act of sketching for various purposes, examined the tendencies of students and instructors on digital sketching in architectural design education and explored whether digital sketching can displace freehand sketching.[2] Analyzing these publications focusing on design education, it can be said that although the objectives of the courses are common, such as emphasizing the importance of sketching in the early stages of the design process, the ways of teaching sketching differ methodologically according to the perspectives of the instructors. For example, A. M. Putra et al. highlighted the importance of the "observational drawings" exercised on-site to "build visual memory"[3] while Sema Soygeniş et al., introduced the act of text writing while sketching to verbally support the thought process and to improve design skill with a new way of expressing the ideas.[4]

Coded M3692 "Sketching in Architecture", the main subject of this paper, is an elective course in the third-year curriculum of the departments at Gazi University Faculty of Architecture. In M3692, the act of sketching is considered one of the most important essence of design. In this context, although the word "architecture" is mentioned in its name, the course can be chosen by the students of Architecture, Urban and Regional Planning and Industrial Design departments. The main purpose of this elective course is to familiarize students with the use of sketching not only as a representational tool, but also as a "discursive" tool.

In the last two semesters, when distance learning started and became obligatory with the Covid-19 pandemic, the usual site trips organized by design studios to explore and analyze the context of an urban space, couldn't be carried out. As a result, students had to design a project in a place where they couldn't have any –spatial- experience. Having insufficient knowledge of the context due to the lack of direct experience at the project site raised an important question as to whether it is possible to discover an urban context virtually. To test the possibility, in the course held in the spring semester of 2020-2021, the students were asked to immerse themselves in the virtual reality of a city they chose as a virtual flaneur/flaneuse on their virtual tour and observe, perceive, and understand an urban space

and its context through sketches while having a virtual trip on web-mapping platforms. In addition, the students were asked to produce a narrative about the context of place again by instrumentalizing the act of sketching.

This paper aims to investigate the possibility of experiencing a place and its context virtually by mediating the act of sketching by examining the students' works, and to explore opportunities of gaining the habit of sketching as mediation of virtual site analysis in architectural design studios in the post-pandemic education.

MEDIATING THE ACT OF SKETCHING FOR THOUGHT PRODUCTION

Drawing and thinking are inseparable. If this is the case then learning to draw is closely related to learning to think. [5]

As it is well known, line is the language of the designer. According to Celal Abdi Güzer, "the line represents thought" and "thought becomes objectified by drawing" so "in a sense, line is the solid state of thought."[6] In an interview, Peter Eisenman states that "the drawings are an indication of the idea and the attitude that the architecture has" and refers to them as "red threads"[7]. In his book titled "The Thinking Hand" Juhani Pallasma states that an architect's hand functions as a "bridge between the imagining mind and the image that appears on the sheet of a paper."[8] Based on these architectural theorists' statements, sketching can be defined as a process of thought production and idea formation. In M3692, it is believed that sketching is one of the finest representations of the "thought process" or in other words "thought formation" which is, referring to Güzer, is also a critical process.[9]

Architecture is also a product of the knowing hand. The hand grasps the physicality and materiality of thought and turns it into a concrete image. [10] *With the aid of notes, sketches and diagrams we link the abstract world with the material world and develop architectural ideas in the form of texts, drawings, objects and buildings.*[11]

The act of sketching provides the designer with a critical perspective and creates a common ground for formal, spatial, social, and cultural explorations.[12] The purposes of sketching, a few of which are exemplified here, are used by various scholars interested in sketching to classify and name sketches, like "thinking sketches", "talking sketches", "prescriptive sketches", "visual impression sketches", "observation sketches", et cetera.[13] In the M3692 course, instead of focusing on such classifications, discussions are made on how sketching can be instrumentalized for though and discourse formation.

During the act of sketching, line -the language of the designer-, turns into a tool for communication. Communication can materialize in two different ways through sketching. First one is the monologue (2) which is the designers' communication with themselves.[14] In other words, the designer's inner talk, which is defined by Suwa and Tversky's as a "reflective conversation with one's own ideas and imagery with themselves."[15] The second way of communicating with sketching is the dialogue (2), which refers to the designer's communication with other individuals like colleagues, engineers, customers, and so on.

In addition to communication, sketching should be seen as a tool to "see" and "understand" the images created and formed in one's mind along with the built environment. Sketching can be used for analyzing a place- or in other words, the built environment in architectural context. This analysis is related to the perception of the designer, so using sketching in the process will improve the perception of the designer. With the help of the perceived information about the built environment, designers can create and produce the physical equivalents of the ideas or images created in their mind through this process. In the process, transferring of the ephemeral images formed in one's mind to the paper is short-lived and rough, thus sketches emerge during this period have an incomplete and vague character. These features of the sketch allow interpretation and provokes a cyclical process (ongoing monologue) and re-interpretation which can increase creativity.

M3692'S AIMS AND METHODOLOGY

Gazi University Department of Architecture students start their design education in the basic design studio. In addition, via technical drawing and expression techniques courses, students begin to use and practice the designer's language -line-, firstly using pencil and paper to develop hand-eye-brain coordination. In all these courses, students are advised to make freehand sketches. However, to keep up with the digitality of the era we live in, it is considered important for students to get acquainted with computer technology early in their career, therefore they are encouraged to use digital drawing/design programs also. At this point, it should be noted that students mostly prefer computer's mediation instead of freehand drawing.[16] Also, with the Covid-19 epidemic, it has become a necessity for students to use computer technologies, and the practice of freehand drawing has decreased and almost disappeared.

As mentioned, and exemplified in the introduction, sketching courses in design education generally unite with the aim of getting students the habit of sketching, boosting their self-confidence for freehand drawing, encouraging them to use sketching in the early stages of design processes and improving their skills of -freehand- sketching. So, in a way it can be said that these courses have undertaken a supplementary function for design studios. Sharing these aims, M3692 also focuses on to exercise the act of sketching to analyze and produce a discourse about the context of a particular time-space.

Lectures

A semester at Gazi University consists of 15 weeks. The syllabus of the course is revised and updated each semester and shared with the students beforehand. Within the scope of the course, 7 or 8 lectures are given. The following topics discussed in some of these lectures are: 'What is a sketch? and what is not?' 'Why do designers still draw in this century?', 'What is Visual Thinking' and so on.

In addition to these, some lectures called 'Eskiz Sohbetleri (Sketch Talks)' are also held during the semester. Architects, interior architects, and landscape architects were invited to these talks to share their own experiences on sketching. The purpose of all these lectures is to encourage students to sketch, overcome their lack of confidence in their freehand sketching and help them to gain the habit of sketching, especially while designing.

Learning by doing

Learning a skill is not primarily founded on verbal teaching but rather on the transference of the skill from the muscles of the teacher directly to the muscles of the apprentice through the act of sensory perception and bodily mimesis. [17]

Due to the practical nature of the act of sketching, students are expected to do various exercises in different scopes and scales, in line with the methodology of learning by doing.[18] It should be stated here that all exercises are expected to be completed in a certain time, like 5, 10 or 15 minutes to gain the skill of rapid self-expression technique.

In the first few weeks, several preliminary exercises such as drawing straight or curved lines, hatching and so on were practiced to accustom students' hands to freehand drawing. Exercises then continue with the creation of repertoires of forms such as people, trees, landscapes (Figure 1.), which will help them to scale the drawing and emphasize the context of a place in the sketches. During all the exercises, the notions of ratio, proportion and scale are explored by mainly relating each form to the other.

These preliminary exercises are then continued by the exercises dealing with the concept of abstraction. These are generally performed after the visual thinking lecture. In this exercises, students are expected to explore what they want to see, understand, and show in their sketches, and to study the level of abstraction in their drawings.

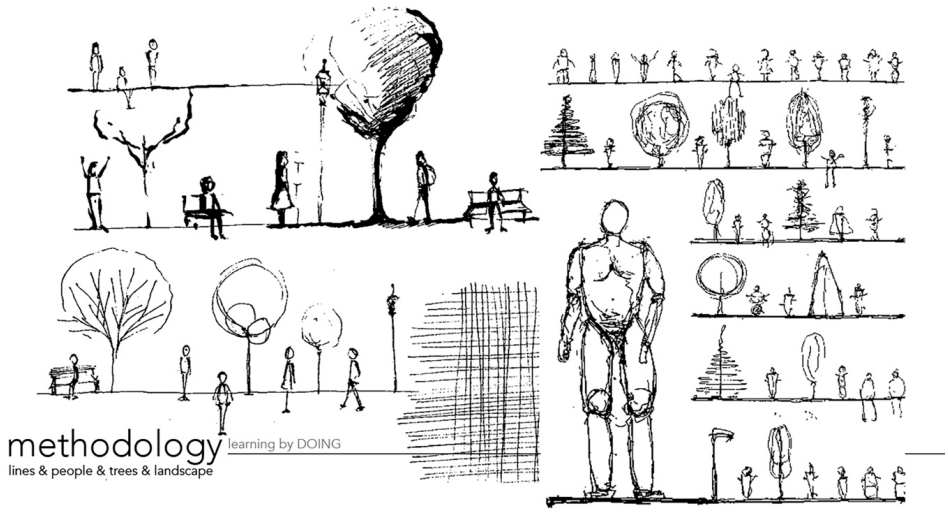

Figure 1. Creating repertoire of forms such as people, trees by Ceyda Ece Kıymaz and Elif Erkol.

After all these preparatory works, emphasis is given to the spatial studies. Firstly, two-dimensional sketches such as plan / section / facade (Figure 2) are practiced. In these exercises, sketches of a building with a simple plan scheme, which is generally an example of modern architecture, are usually made. Through these exercises practiced on architectural spaces, it is aimed that students gain the habit of seeing, understanding, and re-expressing architectural spaces.

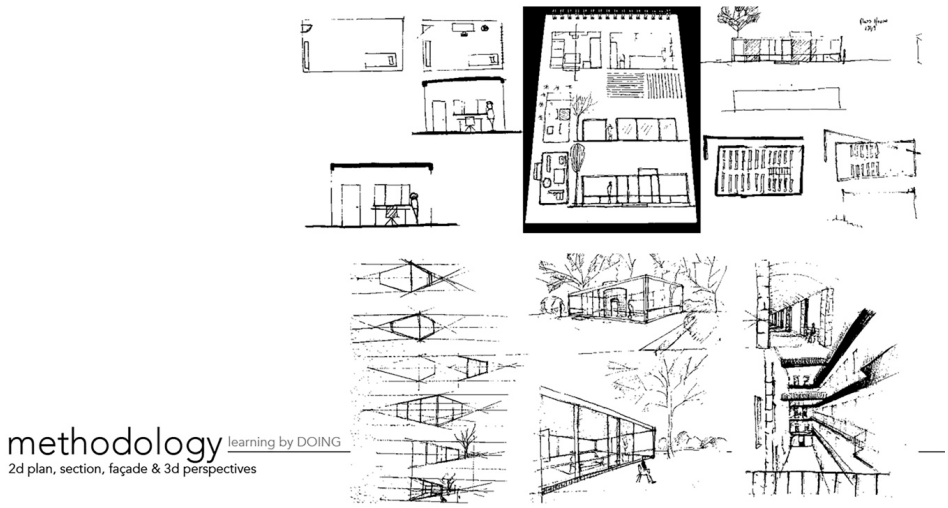

Figure 2. 2d & 3d sketching exercises by Ceyda Ece Kıymaz and Elif Erkol

Afterwards, to make 3D sketches, students are reminded of one-point and two-point perspective drawing techniques, and tips to pay attention to in free-hand perspectives are explained. Subsequently, students are expected to make various 3D sketches at different urban scales (Figure 2).

'Being at home' exercises

The spring semester of 2020-21, was the second semester of distance-learning due to the Covid-19 pandemic. Especially in that semester where the whole world stayed in their homes, students had to do the preliminary sketch exercises at their homes and especially in their rooms where they had to spend most of their time. To have a better understanding of the composition principles such as proportion, ratio, and scale, students were asked to make a series of 2D sketches (plans, sections, and facades) in a gradual and sequential manner -starting from their own room's scale and expanding to

the urban scale. With these sequential scale change sketch exercises, students were expected to discover and use different degrees of abstraction in their sketches. Next, students were asked to draw a few street perspectives from their room windows or the street where their house was located. With these exercises, students began to see, feel, perceive, and represent the context of a particular time-space that they physically experienced. The gradual change in scale, the levels of abstraction used in them, and the contextual diversity —such as regional differences in single houses and apartments— can be observed in Figure 3.

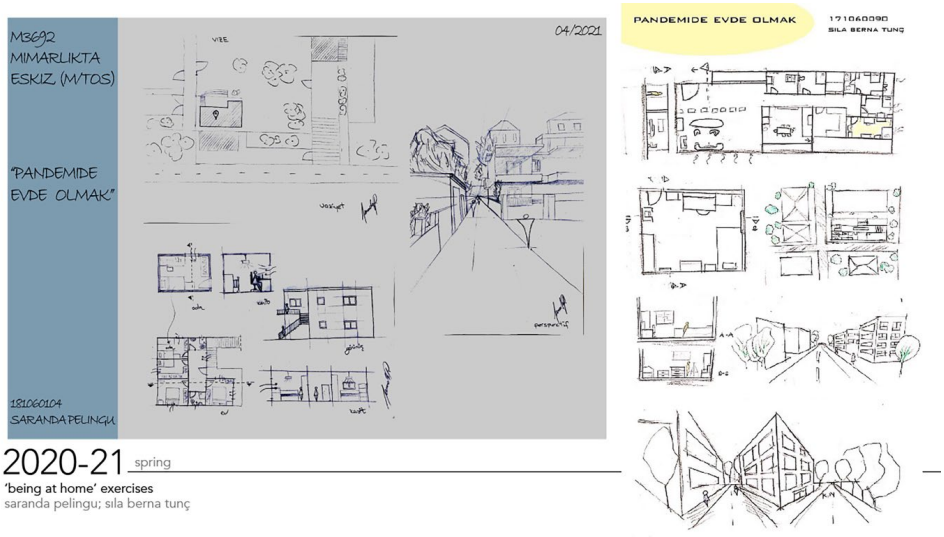

Figure 3. 'Being at home' sketches by Saranda Pelingu and Sıla Berna Tunç.

EXPERIENCING BEING A VIRTUAL FLANEUR/FLANEUSE FOR CONTEXTUAL RESEARCHING

The human body is a knowing entity. Our entire being in the world is a sensuous and embodied mode of being, and this very sense of being is the ground of existential knowledge. '[U]nderstanding is not a quality coming to human reality from the outside; it is its characteristic way of existing,' as Jean-Paul Sartre claims. [19]

The usual site trips organized by the design studios for students to explore, experience, understand and analyze the context of an urban space where they were expected to solve a design problem could not take place due to the Covid-19 pandemic. As a result, the students had to design a project in a place where they have never existed and did not -spatially- experience, therefore have no idea about the context.

As a course aimed at supporting design studios, to address and discuss this problematic, it was decided to experience whether an urban context could be explored and perceived virtually through the act of sketching in the 2020-21 spring semester. With the theme flaneur / flaneuse, students were asked to virtually experience an urban space on web-mapping platforms in a city of their choice and to create a narrative about the context of that particular urban space via freehand sketches.

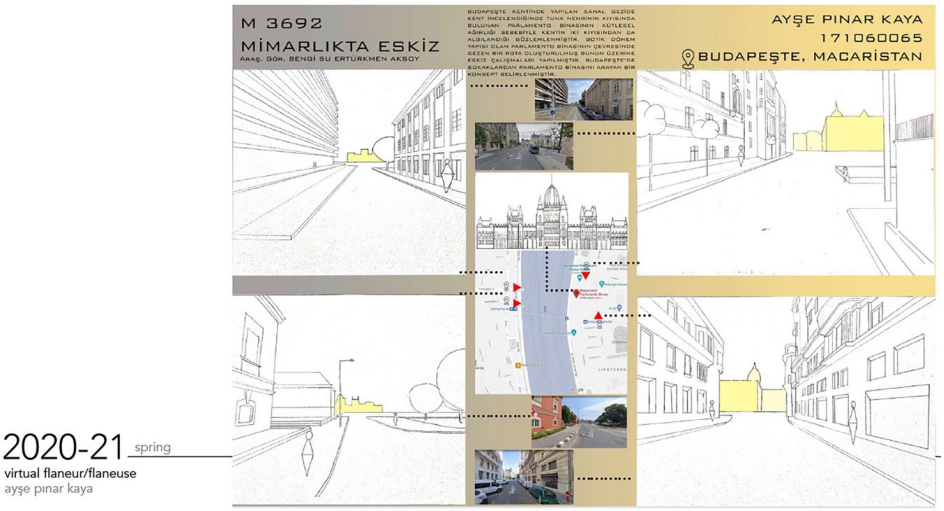

Figure 4. Contextual research at Budapest by Ayşe Pınar Kaya.

For example, one of the students, Ayşe Pınar Kaya, noticed the parliament building during her virtual tour on the streets of Budapest and wanted to investigate its importance for the city in her work. As she wandered around the streets, she was convinced that the building was one of the important landmarks of the city and wanted to create a narrative based on this observation. Accordingly, she directed her gaze to the building and highlighted the parliament building in her sketches by using color (Figure 4).

Eda Nur Ülker, wanted to explore Marrakech on her virtual visit. However, she could not find lots of information about the city on the web-based mapping platforms. The only data about the city was from the Jardin Majorelle, named after the painter Jacques Majorelle and later inhabited by the fashion designer Yves Saint Laurent. While she was wandering around, she was highly impressed by the colors red and blue which is unique for that urban space and formed her narrative around that (Figure 5).

Figure 5. Contextual research at Marakesh by Eda Nur Ülker

Nejla Altom, was curious about the local architecture of the Far East so she chose to visit Korea virtually. For this purpose, through sketches, she worked on different architectural elements such as

roofs and eaves of the buildings, tried to understand the city's scale and examined different uses of varying materials (Figure 6).

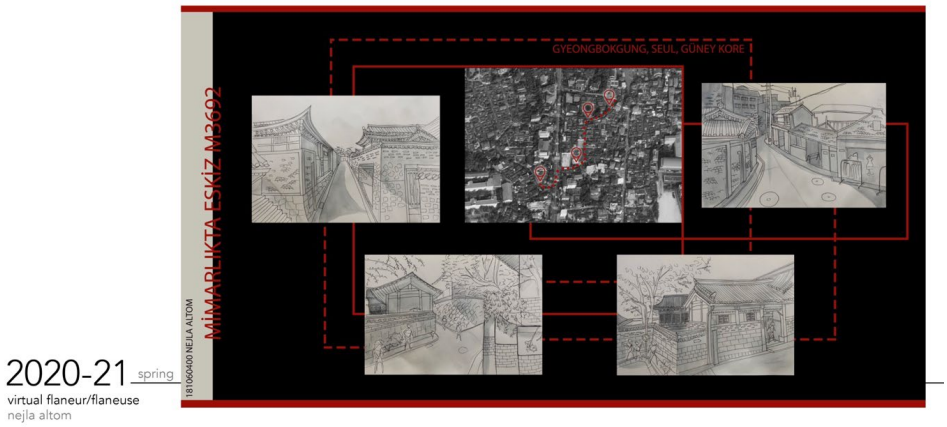

Figure 6. Contextual research at Korea by Nejla Altom

CONCLUSION

Examining the students' works, it can be said that through virtual trips made on web-based platforms, many aspects about the context of an urban space can be perceived and analyzed by instrumentalizing the act of sketching. As seen from the examples, sketching can also be used as a discursive tool in reinterpreting the urban space's context, as well as a representational tool to produce a narrative.

It should be stated here that virtual trips have both positive and negative aspects compared to physical time-space experiences. For example, being able to access an urban space at any time and observe the urban context anonymously through a web-based platform are important advantages of virtual experiences. But with today's accessible technology, examining urban spaces without real people and actions, or in other words, without real experience, can cause the context not to be perceived as a whole or to be misunderstood. Still for now, it can be said that many ideas about the context of an urban space that cannot be physically experienced can be obtained through sketches made during virtual trips in pandemic and post-pandemic education. However, it would not be wrong to say that with the rapid development of technology and the inclusion of virtual worlds in our daily lives in the near future, it will most likely be possible to feel the whole essence of an urban space virtually.

NOTES

[1] For further readings see, Omale Reuben Peter, “Assessment Methods in Free-Hand Sketching and Drawing Related Courses in Visual Communication Education.” IJREH 1.1 (2020): 56-71.; P. Heidari and Çiğdem Polatoğlu, “Current Discussions on Digital Sketching in the Early Stages of Architectural Design in Education.” Int. J. Architect. Eng. Urban Plan 28.1 (2018): 25-35.; A. M. Putra et al. “The Effect of Manual Sketching on Architectural Design Process in Digital Era.” JATIT 100.2 (2022): 413-422.; Sema Soygeniş et al. “Writing as a Tool in Teaching Sketching: Implications for Architectural Design Education.” JADE 29.3 (2010): 283–293.; Kateřina Nováková et al. “Towards Improved Architecture Education.” eCAADe 29 (2011): 63-69.; Susan Rice, “Teaching and Learning About Early Design Sketching in Architectural Education: Towards a Phenomenographic Viewpoint.” Higher Education Research and Development Society of Australasia (HERDSA) (2005): 430-439.; Sema Mumcu and Doruk Görkem Özkan, “Design as a Conversation with Lines: ‘Sketching and Free-Hand’ Course Experiences.” GU J Sci, Part B 6.1 (2018): 31-43.; Serpil Özker and Elif Süyük-Makaklı, “Importance of Sketching in the Design Process and Education.” TOJSAT 7.2 (2017): 73-77.

[2] Heidari and Polatoğlu, 25, states that in the early stages of the design process, architects prefer freehand sketches using paper and pen(cil) while most, if not all, architecture students use the computer even though the conventional digital software is not sufficient.

[3] Putra et al. 414-415.

[4] Soygeniş et al. 285.

[5] Rice, 432.

[6] Celal Abdi Güzer, *Çizgi ile Düşünmek | Çizgi’de Düşünmek*. Ankara: Mimarlar Derneği 1927, 2011: 2.

[7] An interview done and published by the Plane-Site in 2017, Peter Eisenmann. “Time Space Existence.” (published in 06/06/2017) Accessed May 29, 2022 https://www.youtube.com/watch?v=ZNgv2hD4FWI

[8] Pallasmaa, 14.

[9] Güzer, 2.

[10] Pallasmaa, 15.

[11] Yeoryia Manolopoulou, “Unformed Drawing: Notes, Sketches, and Diagrams”, The Journal of Architecture 10:5 (2005), 519, doi: 10.1080/13602360500462323.

[12] A.T. Purcell and J.S. Gero, “Drawings and the Design Process.” Design Studies, 19.4 (1998): 400-401.

[13] Putra et al. 414; Necati İnceoğlu, *Eskizler: Çizerek Düşünme Düşünerek Çizme*. (İstanbul: Nemli Yayıncılık, 2012): 33-65.

[14] Barbara Tversky and Masaki Suwa. “What Do Architects and Students Perceive in Their Design Sketches? A Protocol Analysis.” Design Studies 18 (1997): 385-403.; İnceoğlu, 13.; Mumcu and Özkan, 34.

[15] Tversky and Suwa, 386.

[16] Similar situations have been observed in different universities also. See, Reuben Peter, 58, Heidari and Polatoğlu, 25.

[17] Pallasmaa, 14.

[18] This approach has also been used by several instructors. See, Reuben Peter, 58.; Rice, 433; Mumcu and Özkan, 34.

[19] Pallasmaa, 12.

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PROMPTING CHANGE: UNDERSTANDING THE IMPACT OF PEDAGOGY ON FUTURE TEACHING, PROFESSIONAL AND SOCIAL PRACTICES

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INTRODUCTION

In higher education the contexts of teaching and learning are dynamic, and it can be challenging to understand the broader impact of pedagogy. Typically, discussions about teaching practices focus on student learning, monitoring the development of skills and knowledge, and more recently measuring the immediate impact of changes such as those brought about by COVID-19. Alongside this recent catalyst, other drivers exist to prompt a change, particularly in architectural education. Climate change requires new knowledge and skills to measure and mitigate impact. Existing design strategies are applied differently to new and emerging situations such as increasing urbanisation and changes to government policies and targets. The complexity of architectural projects continues to increase with ongoing technological advances, and more complex clients, stakeholder groups and communities.

In order to respond to the dynamic situations in which we live and work, we require practices that enable us to identify change, assess the impact and shift our position and understanding. A different focus is needed to understand the broader, more long-term social impact of pedagogy on this dynamic professional environment. This paper focuses on the Master of Architecture program at the University of Notre Dame Australia as a means of understanding this broader impact of learning and the role of transformative experiences in architectural education. This reflection on the experience of developing this new program informs our understanding of how higher education learning experiences in general can be transformative, prompting shifts in the worldviews of students, academics, and the stakeholders with whom they engage. These shifts in perspective can influence and drive change in future practices within the academic institution, related professions, and the broader community.

TRANSFORMATIVE LEARNING IN ARCHITECTURAL EDUCATION

Transformative learning experiences provide the catalyst for the shift in learners' worldview, refocusing on the value of communities and decisions that provide long-term benefits. In architectural education, these transformative experiences support the provision of design that provides both immediate and long-term benefit to individuals, communities and the profession.

In formal learning environments such as schools and universities, curricula structures are designed and implemented; learning is scaffolded; and knowledge and understanding is measured. This is evident in the structure of architectural education programs, wherein professional skills and knowledge are developed as the complexity and scale of the projects designed and discussed increases. The development of skills and knowledge determines an individual's worldview, through

which experiences are processed and situations and events are understood. Yet, as education becomes more focused on developing the capabilities required for potential futures, the skills and knowledge developed becomes increasingly disconnected from everyday life, limiting the application of formal learning to everyday behaviour. While providing opportunities for informal learning in lived experiences can increase the self-awareness of learning, prompt transformation of worldviews and initiate a change in behaviour, such learning requires a different set of skills. However, when discussing the role of design and research in environmental (architectural) education, there are many arguments for what constitute core or foundation skills.[1] Skills in communication with others are required when designing takes place as part of a collaborative process in environments that reflect the complexity of the real world.[2] Self-reflective practices make tacit knowledge more explicit and bring ongoing learning to the fore within design practices.[3] Previous research has identified that developing skills in critically reflective practice, meaningful communication and collaboration can strengthen the social responsibility of architectural students, as they come to understand not only themselves, but the diverse worldviews of others through meaningful communication.[4] Dave notes that 'spatial disciplines … not only reflect but also manufacture new values in anticipating changes and times ahead'[5]. It is this creation of new values and their relationship to the discipline of architecture that is of interest when arguing for an architecture program that supports transformation through the development of the core skills of critical reflection, communication, and collaboration.

A System for Architectural Learning

Here, architectural learning is defined as a dynamic system in which multiple environments and diverse stakeholders interact to create change. The skills needed to adapt to changing situations and the new understanding required to influence future positive change must be learned alongside architectural knowledge. Within the system of architectural learning illustrated in Figure 1, the multiple contexts – the built, social, natural and educational – that support development of new knowledge and understanding are made explicit. The people within this system – the staff, students and communities – act as participants and agents of transformative experiences. These people rely on the development of core skills to develop new understandings as they critically reflect, collaborate with others and communicate within and beyond the system. Diverse modes of interaction influence how people behave, share experiences, and relate to one another.

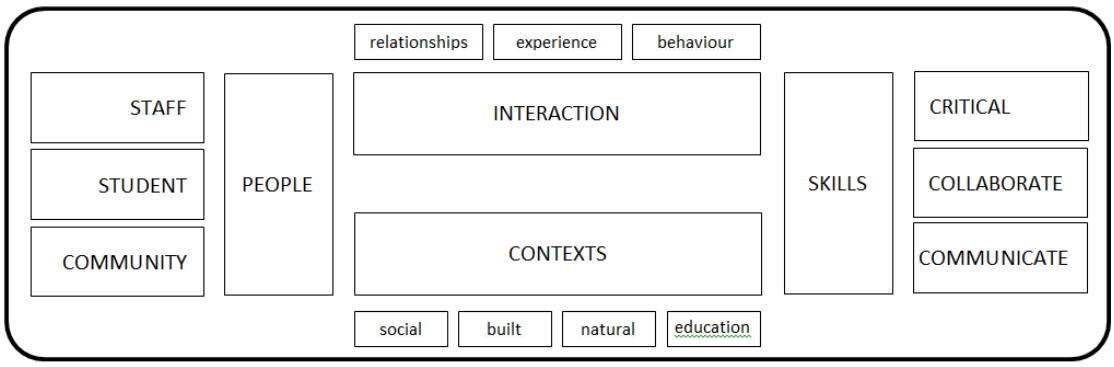

Figure 1. A System of Architectural Learning by Lara Mackintosh[6]

A Framework for Transformative Learning

This systems approach to architectural learning has led to the development of a framework for transformative learning for architectural education.[7] This framework illustrates how the potential for transformation is increased through events that can prompt change, situations that support change and activities that sustain change. Certain learning experiences can prompt, support and sustain transformation in response to changing contexts, providing different opportunities for those involved to shift their worldview, and to become aware of their development of critical thinking, communication and collaborative skills. Within these transformative learning experiences, teaching strategies can be used to support core skill development. These teaching strategies are goal setting or problem finding; developing collective understanding through a common language; and contextualising change to sustain transformation.[8] Recently, developing and implementing the new architectural program at the University of Notre Dame, Australia has provided the opportunity to explore how transformative learning experiences can be realised by implementing these teaching strategies,

IMPLEMENTING STRATEGIES FOR TRANSFORMATION

In most architectural education programs, the technical and professional areas of an architectural curriculum commonly focus on knowledge building through uniform delivery and understanding of principles. While electives such as international study tours, design-build programs and community-based projects increase the potential for transformation, the learning is not easily applied to everyday experiences. However, experiential learning, learning-by-doing, reflects the more meaningful process of transformative learning discussed by Atkin[9], in which the learner is engaged and the learning is grounded in the real world and experience. Such learning experiences have been provided by Lara Mackintosh, Katherine Ashe, Simon Pendal, Robyn Creagh, Holly Farley and Sarah McGann when they created the Master of Architecture program within the University of Notre Dame, Fremantle Walyalup. These learning experiences have begun to influence and drive change in practices within the academic institution, the related professions, and the broader community. One of these transformative experiences is the Architectural Practicum Program.

The Architectural Practicum Program provides the opportunity for Master of Architecture students to reflect critically on real world experiences from different viewpoints prompting new or revised interpretation of experience. Placements with professional partners enables students to complete their assessment tasks in practice, in tandem with their on-campus studies. This time spent in practice builds students' confidence as they strengthen their professional communication and enables them to be critical as they reflect on the depth and breadth of their experience in practice. Additionally, collaboration between students and partners develops industry networks in preparation for entry into the profession. This program is informed by the framework for transformative learning and the teaching strategies identified can be seen in the learning experiences provided.

Assessment as goal setting

In the classroom, it is generally expected that students have the same or similar abilities, can communicate effectively, and come to the same or similar understandings. In practice, the difference in abilities and architectural literacies between students and practitioners can result in difficulties in reaching common understandings. Recognising this diversity in ability and differences can help to identify the action needed to achieve the learning objectives. When this process of setting assessment goals occurs collaboratively between students and practitioner, the result can be a new common sense of purpose beyond the learning objectives, prompting the setting of a common goal through shared understanding. In this practicum program, this process is prompted and sustained through the structure

of the assessment tasks, as student and practitioner together decide on the direction and focus of the topic to be explored.

Collective understanding, common language.

When learning occurs collectively, common knowledge is produced through the sharing of experiences from practitioner to student, and vice versa. However, the theoretical understanding of one may contradict the other's experience in practice. Recognising these conflicts and making sense of them is a critical part of learning, achieved through meaningful and effective communication. Some experiences are best told verbally, while others are better represented visually or graphically. In this practicum program, students and practitioners alike are given repeated opportunities to share experiences and knowledge learnt in the different modes – verbally, graphically and written – in practice and in the classroom, to develop a common language and collective understanding.

Contextualising change to sustain transformation

Once transformation has taken place, supporting new behaviour is critical for this change to become sustainable in the long term. Reflection-in-practice[10] can lead to new understandings in response to emerging situations. When all involved can participate in reflection and critical review such contextualization of change can lead to unexpected responses to the dynamic contexts. The practicums invite a deep and broad engagement with the profession of architecture, and together the students and practitioners reflect on challenges in current practices. Students examine how design practices can respond to contemporary professional issues across all placements and practice partners are encouraged to reflect on changes to practice in subsequent practicums.

IDENTIFYING TRANSFORMATIVE LEARNING

The explicit development of the core skills of critical thinking, communication, and collaboration is difficult to recognise and document using traditional methods of benchmarking, global ranking, and accreditation. In addition to the use of assessment to document development of technical competencies, and observations in class, surveys are used to capture the development of non-technical skills and narratives are collected to record the different interactions for those involved.

Achievement of Learning Outcomes

In architectural learning, recognition of the core skills is often implicit within typical assessment strategies. Within the Practicum program, the benchmarks for successful achievement of outcomes are discussed in class and in practice. Together the students and practice partners define the focus of the assessment task and assessment rubrics accommodate the difference in practice, project and focus. Additionally, students and partners are encouraged to seek opportunities to extend this learning to the practice, as the technical and cultural knowledge developed by the students in completing the assessment tasks can be applied to support professional and personal development in practice. This is achieved when students share their final reports with the partners' practice at the end of each placement.

The (non-technical) skills

The core skills are often considered 'soft' or 'non-technical' skills and as such, they can be seen as secondary to discipline-focused skills. However, mastery of these non-technical skills ensures that in practice, the diverse stakeholder experiences and cross-disciplinary information are understood across a range of situations. The tasks undertaken in practice require students to work independently, finding relevant sources of information and liaising with project teams where required. Students are encouraged to look for experiences in practice particular to their interests and aspirations, and where

appropriate engage in discussions and activities beyond the scope of their assessed work. At the end of the year, in surveys used to identify achievement of employability skills such as communication, teamwork, self-management, initiative and professionalism, practitioners consistently rate students highly. Additionally, at the regular partner reviews, students speak about complex issues with precision and authority, often without notes. Students confidently present an alternative point of view and hold their position when questioned and asked to explain the decisions made.

Reflective Narratives

The practicum program supports transformation across a broad community and has had an impact on practitioners and academic alike as well as students. The student and practitioner narratives below are selected from emails and conversations in which they reflect on and review their experiences. As the sole academic involved in the practitioner program to date, the academic insights shared here are personal and are included as evidence of impact on an individual worldview.

The Student

In addition to the achievement of learning outcomes, the learning experiences are placed in an educational context where students can explore and develop their professional identity and independence, while also fostering the collaborative and communication skills required in a professional environment. For the students, *"the practicum element of the course has been invaluable. It has allowed my studies to be both broad and deep through its connection to the design industry."* The supportive studio culture established through the actions of the teaching staff in "*fostering the individual… has enabled a culture of openness and sharing where students spend time helping and encouraging one another.*"

The Practitioner

The connection between student and practice not only empowers students as they find alternative ways of responding to current issues but benefits practitioners, as they become learners themselves.
"… we're having a really productive day in studio today!...the discussions that have ensued have been fascinating and very insightful! … very excited to see what conversations will come out of this next week… enjoying the journey …"
Additionally, the student / practitioner relationship becomes more balanced when the student is *"treated … as another staff member whilst in the studio and has been subjected to the same level of review and critique as we would with other staff"*. This approach also serves to challenges pre-conceived ideas of the capabilities of students, as practitioners are *"very pleased with the enthusiasm, methodology and work ethic … demonstrated across this practicum. There is no doubt that she bit off more than she could have and has really challenged herself …I am impressed with her understanding and attention to details in her deliverables as a student …"* This balanced relationship is also evident in the partner reviews, where practitioners often defer to students in the discussions, as students lead the partners through new ways of thinking about practice and projects. On occasion, practitioners have indicated how they value the insights gained from students and in some cases, this has informed changes to their own practices.

The Academic

The development of this practicum program has prompted reflection of current teaching practices and has prompted a more critical pedagogy. Students are empowered to engage with and direct their learning experiences as the academic 'steps away', changing the role of the academic changes from 'the sage on the stage' to 'the watchful eye'. The impact of this new role is felt in several ways.

The focus of weekly classes shifts from ensuring achievement of assessment tasks in class through content delivery to providing opportunities for peer-to-peer and in-practice learning. This experience can be challenging for the academic, as the time normally spent actively lecturing or working directly with students is spent instead watching as conversations unfold. The assessment tasks are non-graded and while it is rewarding to see how the diversity of project types and direction focuses learning outcomes differently, there is little opportunity to reward excellence. This has prompted alternatives ways to celebrate achievement beyond the mark or grade and the Practice Partner Review sessions have become moments of shared celebration not often found in the assessment of technical subject areas. Engagement with practitioners outside of class is required to moderate assessment of competencies and ensure consistency of experience. The task of regularly explaining the teaching model to practitioners prompts reflection and provides validation beyond the usual student surveys and performance reviews.

CONCLUSION

The community that is often best served by an architectural program is the architectural education community itself, as it can be difficult to maintain long-term relationships with individual students whose time in the program is relatively short. However, understanding learning as a system and making this learning visible to a broader community means the influence of learning can also be felt more widely. When teachers are defined as co-learners, and when these teachers include practitioners, this community is extended to the wider professional community.

The experience of developing these new programs offers a unique opportunity not only to reflect on successes and challenges faced, but to look forward and identify new directions for architectural learning. Transformative experiences in architectural learning can support the development of core skills of critical thinking, communication and collaboration. Learning experiences such as goal setting activities and using effective communication and a common language to share experiences can also sustain change in architectural practice and teaching approaches. Embedding the key teaching strategies into architectural education can enable those involved to develop the ability to respond to changes in the future. The skills and knowledge developed can be applied to support professional and personal practice in different and dynamic situations. Designers that think critically about their experiences and set goals in collaboration with others are able to respond to new situations as they arise. The common language developed collectively through reflection and the sharing of experiences with all stakeholders, enables ideas and concepts to be communicated in ways that are easily understood by others from diverse contexts and backgrounds.

As the global mobility of professionals' increases these learning experiences will support a sustainable universal design industry. Transformative designers, those who have learnt through a transformative experience and those who are capable of effecting transformation in others and in their environments, will be able to understand new situations and contexts and communicate their ideas and concepts in ways that are easily understood by others. Learning to be able to respond to the unknown future requires different skills and a flexible, but purposeful, positioning of worldview, so that the decisions that will be made will be of benefit for all.

NOTES

[1] Bharat Dave, "On Shifting Grounds—Architecture, Landscape and Planning." In *Innovation in Australian Arts, Media and Design: Fresh Challenges for the Tertiary Sector*, ed. Rod Wissle et al. (Flaxton, QLD: Post Pressed, 2004).
[2] Victor Papanek, "For the Southern Half of the Globe." Design Studies 4, no. 1 (1983): 61–64.
[3] Donald A Schön, *The Reflective Practitioner: How Professionals Think in Action.* (New York: Basic Books, 1983).
[4] Lara Mackintosh, "Sustaining Learning: Transformative Experiences in Architectural Education" (PhD diss., The University of Western Australia, 2018).
[5] Bharat Dave. "On Shifting Grounds," p.89
[6] Mackintosh. "Sustaining Learning"
[7] Mackintosh. "Sustaining Learning"
[8] Mackintosh. "Sustaining Learning"
[9] Julia Atkin, "Values for a Learning Community: Learning to Know." (paper presentation, Victorian Principals' Conference, Melbourne, Australia, August 1999).
[10] Schön, *The Reflective Practitioner.*

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GAME-BASED LEARNING IN THE INTRODUCTORY ART HISTORY COURSE: WEAVING HISTORICAL CONTEXTS AND INCENTIVIZING CRITICAL LOOKING

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INTRODUCTION

This paper discusses my experience over the past several years as an instructor in offering an optional game-based learning (GBL) component in an introductory western art history course of 100 to 375 beginning art history students. This paper will contribute to the field of GBL-based pedagogy, particularly as it is pursued in the humanities. Recent publications have shown that GBL is a worthy approach and has considerable pedagogical value.[1] I note that almost none of the current literature on GBL in the humanities discusses the discipline of art history.[2] While the present study is not systematic, it foregrounds considerations specific to the application of GBL to art history content.

Students in the course could elect to complete or play two computer games designed by the Triseum Company, *Mecenas* and *Lumière*, as one of the course requirements.[3] This essay also foregrounds my qualitative analysis of the response of students to gameplay within the disciplinary framework of art history. The Triseum games channel significant aspects of the student learning experience in that through various mechanisms, they pique student interest and enhance students' skills of visual identification and analysis: for instance, the games strengthen students' retention of art and historical fact through spatial memory techniques.[4] I will offer anecdotal evidence gathered in my GBL-enhanced art history courses that indicates certain aspects of learning have been realized in practice and that points to consistent undergraduate motivation and engagement with two historical eras—that of the historical era of the Renaissance as well as with that of Impressionism in late 19th century Paris—through game-play. While I will describe basic scenarios of each game in what follows, I will focus more closely on the structure and key details of *Lumière*, the more complex and popular of the two games.

COURSE OBJECTIVES AND KEY CONTEXTS OF THE INTRODUCTORY ART HISTORY COURSE

The traditional art history lecture and textbook strive to inculcate the essential art history skills of visual identification and careful visual analysis of important artworks.[5] Conventional learning objectives in a traditional art history class include gaining the skills to be able to identify key objects, artworks, monuments and buildings in western and world cultures. Students are also asked to work toward using specialized art history terminology correctly in order to describe elements of artworks and architectural structures and aspects of the artistic process. Finally, students are asked to understand how the social, economic, theological, or other cultural, contexts of a given artwork or

architectural structure contributed to various meanings for the work during the time of its creation.[6] These objectives are presented in course lectures as well as in the supporting textbook used in conjunction with the lectures.

Students' retention of material is reinforced with targeted quiz and exam questions. These assessments test students' ability to define and apply critical terminology appropriately, and to identify crucial elements of a given artwork or monument as being connected to the work of certain canonical artists or architects in the western tradition. More challenging assignments and questions might further ask students to synthesize how certain historical economic and social contexts might have impacted the meaning of these objects and artworks. Such understanding of the complex webs of meaning behind an artwork characterizes skills and understanding developed in advanced or upper division work in the discipline. There are usually several major contexts for visual art that are foregrounded in a beginning western art history class. First, the context of the Roman Catholic church as a patron of the arts and architecture is underscored; then the historical rise of city-based markets and international trade and exchange, including those of the salon and the gallery system, is foregrounded; and finally, pivotal historical events such as monarchies, revolutions, scientific discoveries, imperialist expansion and nation-building are other cultural contexts of note in a beginning western art history course.

Many of my students have found the participatory, first-person game-narrative based in a historical time period—central to Triseum's art history games—to be more engaging as they work toward these same skills and as they learn about key historical and cultural developments. I believe one reason for this high level of commitment to the games is because at each gameplay level, the player repeatedly cycles through the game design's spatial clues and sites such that these, along with other information, become highly mnemonic and facilitate the retention of European historical names, dates and places, even for those students who have little to no previous study of western history.

BUILDING THE COMPUTER GAME INTO A SYLLABUS AS AN ASSIGNMENT

My introductory course uses the Triseum games as required assignments in tandem with a traditional lecture format with a supporting text and key terms lists. After some experimentation, I've found the optimal framework for coursework is to give students a choice of their primary course requirement. Students can opt to play/complete the two art history computer games *Mecenas* and *Lumière* as a requirement, or, to submit two essays that require a similar level of sustained work. In the online modality, this second written option was a film review, chosen from a curated selection of narrative films of varying levels of complexity and that engage key artistic figures after the Renaissance.[7] After a requirement choice was built into the syllabus students responded more positively to the games, as this then became a self-selected group of gamers.[8]

This reaction would confirm the idea that some individuals are simply game aficionados who have considerable expertise with gameplay and who seek out opportunities to play and experience different game designs (they could also be budding game designers). These students might choose to enroll in a course just because they've heard about the option of gameplay in it, or are simply curious about how a computer game could be used as an academic assignment.[9] Other students seem adverse to games or fearful of engaging with them, perhaps because they are not familiar with video games and thus are apprehensive about being required to play one in an academic setting. Sometimes the game-adverse are older, returning students but not exclusively so; in my experience in the classroom those students who are open to games don't seem to be a fixable demographic. Instead the openness to playing a computer game appears to be more of an individual choice, and of possible willingness to take on the risk of engaging with the unfamiliar as an aspect of higher education learning, and for which one is academically evaluated.

THE GAME *MECENAS*

Each art history computer game has several levels: *Mecenas* has four levels of play, and *Lumière*, three acts or levels (though it is the more time-consuming game to complete). The *Mecenas* and *Lumière* games are both structured around a historical persona and a first-person perspective; gameplay thus involves players playing the role of this historical personage of the era. Economic or artistic competition is foregrounded in each game—within the commerce and finances of a fifteenth-century Medici-like prince in *Mecenas* (and who remains an invisible presence); or, in *Lumière*, in the art-market interactions and exhibition-organizing of the American impresario "Horace Browne," who is the avitar of the game-player. Horace inhabits and works within the nineteenth-century Parisian studio/gallery system.

In these games or GBL-versions of art history material, the visual skills of art history are prompted in social interactions or networking that the first-person player of the game experiences. Especially in the *Mecenas* Renaissance-era game, the economic and political context of the era is made predominant through a series of trades and banking transactions that are to be completed by the first-person player.[10] In *Mecenas* the player does not have an avitar nor do you interact with other specific characters. This game then takes on a static quality, which some students indicated they preferred, but the game does not depict or move through specific buildings or sites in Florence or other city-states.

The first-person player of *Mecenas* is presented with possible economic transactions with other partners like the city-state of Milan and the Ottoman Empire; a Davizzi family trader; or a church mining guild (Figure 1). You are prompted as the player to make decisions about trading with them. You as the player play the role of a Medici-style banker, and must decide where to invest or divest and reckon with the political penalties that some business decisions carry with them. You try to stay out of bankruptcy while navigating the politics of Medici-family business dealings with both their allies and competitors of the 15th century. For instance, the game reminds you that usury is condemned by the church in punishing you by taking away points earned when you decide to accept loans in order to make a larger profit, since this hurts your social standing with the church and can risk your future transactions with them. In some transactions you must deal with fallout from the Protestant Reformation or the historical invasion of the Holy Roman Empire. You are asked to decide which major artwork to commission, which will make or break the reputation and career of artists involved (such as Sandro Botticelli). For these commissions you the player are presented, in a commissioning mini-game, with three images of artworks with brief descriptions. From these you are to select the one most appropriate to the situation or one that is most advantageous to your various alliances. This choice also requires that you are able to identify important Renaissance artworks that are covered in the class lectures.

Figure 1. Mecenas game, possible economic transaction of first-person player, screenshot. ARTé: Mecenas, Thomas, Andre; Bologan, Anatol; Carruthers, Steve; Finch, Sherman; Pedersen, Susan; Spurgeon, Janet L.; Stoenescu, Livia (2016). ARTé: Mecenas. Triseum. Available electronically: https : / /hdl .handle .net /1969 .1 /187089

THE GAME *LUMIÈRE*

With Horace Browne as her avitar, the player in *Lumière* moves through various spaces that depict the cityscape of nineteenth-century Paris. Horace, an American in Paris in the game, seeks to further his career as a gallerist and art activist in Paris. He ends up serving as a negotiator between the established old guard of the French academy and the upstarts of the younger generation who were the artists of Impressionism.[11] The old guard is represented in the game by the academy painter Ernest Meissonier and the head of the academy, the Comte de Nieuwerkerke, characters Horace encounters at the salon; their associated site is the Palace of Industry, where the official salons took place (Figure 2). The Impressionists in the game are represented by the artist-characters Gustave Courbet, Eduoard Manet, Berthe Morisot, Victorine Meurent, Mary Cassatt, Claude Monet, and Edgar Degas. In a layer of stealth introduction to key figures of the era in French culture, Horace encounters Charles Baudelaire and Emile Zola as the game progresses, major art critics of the era whom students then also register as important figures of the period.

Figure 2. Lumière game, Horace/avitar with members of the French Academy in the Salon, screenshot. ARTe: Lumiere, Thomas, Andre; Ramadan, Hadeel; Campana, Lilia; Leiderman, Daniil; Sutherland, Susan; Zawadzki, Mary (2018). ARTé: Lumiere. Available electronically: https : / /hdl .handle .net /1969 .1 /188003

As a player progresses in the game, an element of feminist critique is revealed in Horace's exchanges with women painters Cassatt and Morisot about the difficulties they encounter in exhibiting their work in Paris and about their concerns for their own reputations in Parisian society if they were to serve as models (Figure 3). Regardless, Horace tries to convince Morisot to pose for Manet; later, in a hand during the "Connections" mini-game (explained below), students are presented with the image of the actual 1871 Manet portrait of Morisot (Figure 4), and some students make the connection to the earlier conversation and the feminist content of this painting. The Connections game also underscores for players that Meurent, like Morisot, was an accomplished artist in her own right in addition to serving as a model for Manet (for which she is much better known in traditional art history).

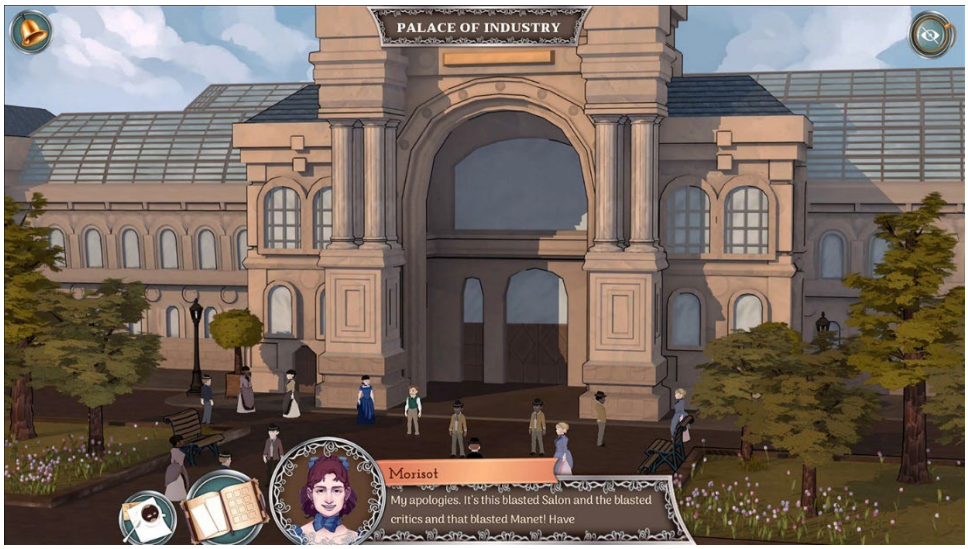

Figure 3. Lumière game, Horace/avitar in conversation with Berthe Morisot outside the Salon, screenshot. ARTe: Lumiere, Thomas, Andre; Ramadan, Hadeel; Campana, Lilia; Leiderman, Daniil; Sutherland, Susan; Zawadzki, Mary (2018). ARTé: Lumiere. Available electronically: https : / /hdl .handle .net /1969 .1 /188003

Figure 4. Édouard Manet, Le Repos, 1871; Édouard Manet, Public domain, via Wikimedia Commons (https://commons.wikimedia.org/wiki/File:%C3%89douard_Manet_-_Le_repos.jpg)

Visual Identification in the "Connections" Mini-Game

Lumière furthermore develops students' skills of visual analysis and identification through the drills presented in the mini-game "Connections" (Figure 5). Connections is a strategy card game that Horace/you are cued to play with another character as you progress into the later acts. It involves linking cards or artworks to each other on a playing surface in a number of categories: by period, by

artist or by genre (meaning: landscape, portrait, still life or history painting). You wager against your artist-opponents—Manet and Courbet, among others—about the accuracy of how you "link" artworks to each other through shared features. This categorizing of artworks requires you to be able to identify them. All of the cards/artworks featured in *Lumière* can even be looked up in a book-like Codex located in a button in the game, but many players do not realize this. The rounds of the Connections game demand visual knowledge of nineteenth-century art, and many players (myself included) have to replay the card game repeatedly in order to advance to the next level. Because of the repetition it requires, Connections is a drill and mnemonic about identifying various motifs and styles in artworks and knowing differences and commonalities between what the French academy valued and what the Impressionists put forward. While some students bristle at the repetition required, many say they honed visual skills in it and as a result, they scored higher on quizzes or exams in the course.

Figure 5. Lumière game, the mini-game "Connections," screenshot. ARTe: Lumiere, Thomas, Andre; Ramadan, Hadeel; Campana, Lilia; Leiderman, Daniil; Sutherland, Susan; Zawadzki, Mary (2018). ARTé: Lumiere. Available electronically: https : / /hdl .handle .net /1969 .1 /188003

Art History as Networking

The game follows Horace as he tirelessly organizes numerous artists to protest against the academy's policies and to stage a counter-exhibition for those rejected for the salon. In the game this alternative exhibition is staged in the commercial Durand-Ruel Gallery, some distance from the Palace of Industry; in reality, the historical Impressionists displayed their artworks in another wing of the same building after their public protests convinced Emperor Napoleon III to grant them a space there for an officially sanctioned "Salon of the Refused." As the player learns later in the game, even the Impressionists show independence—for instance, the avitar Degas declines to sign Browne's protest petition because he states that he still supports the official salon and not a counter-exhibition to it. And to use the parlance of our time, the game is about Horace as he "networks" in real time to cement his connections in Paris and to establish the artistic reputations of the upstart artists. *Lumière* thus debunks the facile myth of artistic genius as a direct route to fame and fortune. Horace enacts a key context for art: he shows that even in the nineteenth-century artworld, the building of crucial artistic and business relationships was a foundation for advancement and success.

Engaging Spatial Memory and Stealth French History

And while in comparison *Lumière*'s animated renderings of various art sites in the historical Parisian artworld are almost cartoonish, lacking the detail of the actual places in question (as we see in a side-by-side comparison, Figure 6), they nonetheless function as visual anchors for Horace's/the player's various encounters and conversations with major figures of Impressionism and important events in which they participated. Arguably, the game then uses well known spatial memory techniques, such

as the memory palace or journey (as outlined by Frances Yates in *The Art of Memory*). *Lumière*'s Parisian spaces include the Gare St. Lazare train station; the Palace of Industry (home of the Academy and the Salon); Manet's studio; Monet's home and gardens at Giverny; and the interior of the Durand-Ruel 78=Gallery. *Lumière* establishes a vaguely French atmosphere and another memory technique in the repeated music and other sounds which come up when one enters or exits a given game level or arrives at a particular site: for the train station, a French-style accordion riff is alternated with the sounds of French being spoken; in the salon and the gallery spaces, one hears muted conversations and footsteps on a wooden floor.

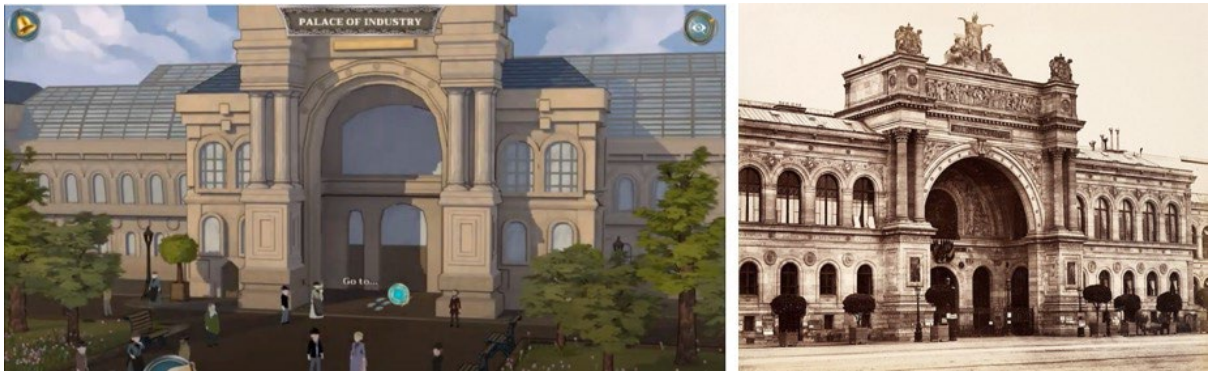

Figure 6. Left: Lumière game: the Palace of Industry; Right, photograph of the Palais de l'Industrie, Paris, by Édouard Baldus c. 1860. Left: ARTe: Lumiere, Thomas, Andre; Ramadan, Hadeel; Campana, Lilia; Leiderman, Daniil; Sutherland, Susan; Zawadzki, Mary (2018). ARTé: Lumiere. Available electronically: https : / /hdl .handle .net /1969 .1 /188003. Right: Édouard Baldus, CC0, via Wikimedia Commons: https://upload.wikimedia.org/wikipedia/commons/9/94/Palais_de_l%27Industrie_-_%C3%89douard_Baldus.jpg

During gameplay players are slyly introduced to specific Parisian avenues, neighborhoods and areas that were important to the Impressionists (such as the Boulevard des Capucines and Batignolles, in the 17th arrondissement). The mini-game "Discourse" delivers another stealth teaching moment (Figure 7): in it characters like the painter Victorine Meurent (and others) quiz Horace/you about current events, French history and aspects of art, asking you to fill in the blanks of their questions correctly—or face their withering boredom and haughty insults regarding your lack of sophistication. These exchanges are thinly disguised French history lessons and they are delivered without penalty, since players can repeat these mini-games and correct their answers in another round. Thus *Lumière* offers you/the player the opportunity to learn French history and art history quite painlessly within quasi-conversations or card games with major artists and critics of late nineteenth-century Paris, which students say they enjoy almost despite themselves. Many students later realize that having to repeat these quizzes to progress through a level facilitates their retention of even the lecture material.

Figure 7. Lumière game, the mini-game "Discourse," screenshot. ARTe: Lumiere, Thomas, Andre; Ramadan, Hadeel; Campana, Lilia; Leiderman, Daniil; Sutherland, Susan; Zawadzki, Mary (2018). ARTé: Lumiere. Available electronically: https : / /hdl .handle .net /1969 .1 /188003

CONCLUSION

I began by outlining major objectives of teaching the essential art history skills of visual identification and analysis in the beginning art history course, as well as of gaining knowledge of western history. In my experience students find that the participatory, first-person game-narratives by the Triseum Company, based in a historical time period, can be more engaging than a textbook as they work toward the outcomes of successful visual analysis and increased historical knowledge. The economic and cultural transactions completed by the first-person player within each game level of *Mecenas* and *Lumière* incentivize students to become more attentive to visual detail and to the facts of history. Student feedback evidences that the modality of gameplay, and the mechanics and mnemonics of the Triseum art history games, enable many students to become more confident in their visual, and finally also art historical, skills.

NOTES

[1] See Niamboue Bado, "Game-based learning pedagogy: A review of the literature," *Interactive Learning Environments* (2019): 1-13.

[2] As evidenced in Julie Borup Jensen, Oline Pedersen, Ole Lund, and Helle Marie Skovbjerg, "Playful approaches to learning as a realm for the humanities in the culture of higher education: A hermeneutical literature review," *Arts and Humanities in Higher Education* 21, no. 2 (2022): 198-219.

[3] André Thomas, Anatol Bologan, Steve Carruthers, Sherman Finch, Susan Pedersen, Janet L.Spurgeon, and Livia Stoenescu, *ARTé: Mecenas*, (Triseum, 2016), available electronically from https : / /hdl .handle .net /1969 .1 /187089; and André Thomas, Hadeel Ramadan, Lilia Campana, Daniil Leiderman, Susan Sutherland, Mary Zawadzki, *ARTe: Lumière* (Triseum, 2018), available electronically from https : / /hdl .handle .net /1969 .1 /188003.

[4] The Triseum Company has a broader disciplinary scope for game development which goes beyond art history, which indicates the reach of their GBL research into other fields such as the pedagogy of mathematics, specifically, the teaching of calculus. See also André Thomas, Paulo Lima-Filho, Susan Pederson, Hadeel Ramadan, and Anatol Bologan, *Variant: Limits* (Triseum, 2017), available electronically from https : / /hdl .handle .net /1969 .1 /188002.

[5] A focus on these disciplinary skills and student outcomes is clearly discernable in several commonly-used college survey textbooks for western art history, which include Marilyn Stokstad and Michael Watt Cothren, *Art History* (Pearson, 2018), and Helen Gardner and Fred S. Kleiner, *Gardner's Art Through the Ages: a Global History* (Cengage Learning, 2015).

[6] As the progressive methods of the New Art History of the 1970s became more widely adopted throughout the discipline, revisionist survey textbooks integrated feminist, social art history, and psychoanalytic positions into course content. This methodological thinking can be tracked in the *Arté* games discussed in this essay. One such revisionist text was Laurie Schneider Adams, *Art Across Time* (New York: McGraw-Hill College, 1999), which set off a wave of new editions of the aforementioned ones by Stokstad, Gardner and others. On the main developments of the New Art History see the useful survey by Jonathan Harris, *The New Art History: a Critical Introduction* (London, New York: Routledge, 2001). Substantive recent contributions to an expanded New Art History have applied post-colonialist and gender studies-related positions to the discipline, most notably: Angela L. Miller, Janet Catharine Berlo, Bryan Jay Wolf and Jennifer L. Roberts, *American Encounters: Art, History and Cultural Identity* (Upper Saddle River, NJ: Pearson, 2008); Claudia Mesch, *Art and Politics: a Short History of Art for Social Change since 1945* (London: I.B. Tauris, 2013); and David Getsy, “How to Teach Manet’s *Olympia* after Transgender Studies,” *Art History* 45.2 (April 2022): 342-369.

[7] Other possibilities for an alternative assignment would be students' critical review of an art exhibition they have viewed or attended, or a review of a recent exhibition catalogue of an exhibition they wish they could have attended—as recommended by their instructor and tailored to their interests. As I've offered the online modality of the course more frequently, I've found the film reviews to be the most effective and motivating option for beginning students who may not have access to metropolitan areas or resources like public collections of art. The curated films are made available for the online students through a library link, which allows for them to stream the films. Some films are not free of charge and are streamed through commercial providers like Amazon or Netflix; students don't seem to mind paying a rental fee to view them.

[8] It is recommended that instructors continue to extend flexibility to students in terms of their selected course assignment of the games, which I've found is still possible up to just before midterm. That is, if before the soft deadline for gameplay (at midterm) students find the *Mecenas* game to be more time-consuming or difficult than they had planned for, it is best to allow students to opt into the alternative writing assignment instead. However I've held to a course policy which does not allow for students to complete one game and one assignment. My reasoning for this policy is that students gain expertise in playing of the first (art history) computer game or in the writing of the first critical film review. Students' experience with gameplay or writing of a review should benefit them in improving their performance on their second game (perhaps playing it in less time) or film review, and therefore, should help raise their course grade. The use of soft deadlines for the gameplay and review assignments is also recommended.

[9] This question is often repeated by students in discussion board commentary and in student evaluations of the course. For those that pose the question after their experience with the Triseum games, they answer that they have been convinced that gameplay can actually be beneficial and part of educational experience.

[10] A groundbreaking art history of the Italian Renaissance that foregrounds the trade, economics, and mercantilism of key city-states of the period, and upon which *Mecenas* is based, is Michael Baxandall, *Painting*

and Experience in Fifteenth-Century Italy: a Primer in the Social History of Pictorial Style (Oxford: Oxford University Press, 1973).

[11] The essential revisionist histories of French art of the nineteenth century which form the foundation for *Lumière* are: Albert Boime, *The Academy and French Painting in the Nineteenth Century* (New Haven: Yale University Press, 1986), and T.J. Clark, *The Painting of Modern Life: Paris in the Art of Manet and His Followers* (Princeton: Princeton University Press, 1984). Denise Murrell's 2018 Wallach Art Gallery exhibition and catalogue, *Posing Modernity: the Black Model from Manet and Matisse to Today* (New Haven: Yale University Press, 2018), is the crucial post-colonialist addition to this literature.

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TOWARDS A PEDAGOGICAL FRAMEWORK: IMPLEMENTING STUDIES OF DESIGN METHODS AND COMPOSITIONAL STRATEGIES IN ADVANCED ARCHITECTURAL DESIGN COURSES

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INTRODUCTION

The author reviews the works of multiple authors in the field of design methods, spatial composition and studio pedagogy to pose a framework for understanding and defining an understanding of the central topics and design methods relevant to architectural education. These are essential regarding the formation of core competency in comprehensive design studies in architecture. The premise is that architectural design education should also develop from a clear understanding of the epistemology in the field. Design education in architecture should work at a core level from points of common or established design methods and link them to clear strategies in forming physical solutions embodying both the evidence or performance-based characteristics, problem framing narrative(s) and compositional dimensions of architecture. The author will refence both work samples drawn from assignments and assessment methods used in the course.

Professional Occupations as Intellectual Domains

"The improvement of understanding is for two ends: first, our own increase of knowledge; secondly, to enable us to deliver that knowledge to others." ~John Locke

Professional occupations commonly defined as law medicine, engineering, architecture, education, and accounting etc.. are generally defined as having a 'service orientation' commitment to the collective good of a society, not a trade or for profit only based economic activity alone. The recent demand for corporate social accountability has fostered new organizational business structures. Some private architecture firms today establishing their own non-profit entities, often advocacy based, for those firms involved in public housing, e.g., London Bone, Baker and Brooks/Scarpa. The work of Magali Sarfatti Larson from a sociological perspective, describes the common characteristics of the professional occupations. They are distinguished from other occupations as follows: The have a "professional association, institutional formal training with abstract knowledge as a cognitive base, qualified by state or government licensing, operate with a degree of autonomy, engage peer or colleague control and have an established code of ethics." [1]

The requirement for a formal education in architecture is as some say late in coming into the field of architecture in the United States. Today seven years of experience in architectural practice is an accepted pre-credential for professional registration in the state of Wisconsin. Architectural educators

themselves also too often distance themselves from recognizing the work by licensed architects and discount the importance of professional credentials. Rather they hold up the work of signature architects whose focus is self-referential in establishing a unique work of art often with the demonstration of formal, material, or construction system tectonic preferences. Expression of the architects personal political, cultural or intellectual preferences dominate. Major figures of the 20th century that comprise prominent positions in history and contemporary publications but do not hold degrees in architecture include Frank Lloyd Wright, Louis Sullivan, Le Corbusier, Mies van der Rohe, Luis Barragan, Carlo Scarpa, Tandao Ando and most recently Peter Zumthor. Max Bond the N.Y.C. architect noted in the 1990's that the profession in America has lost 'it's middle ground' i.e., those firms that spanned the gap between the unknown and exalted (signature architect) practitioners. If many celebrated architects were educated outside of academic institutions what does that say about higher education?

Higher Education- Cognitive Frameworks

In education B.S. Bloom's work in 1956 to establish a hierarchical taxonomy or framework for cognitive abilities is often cited as the foundation for organizing educational coursework. In addition it is now employed for establishing educational assessment programs and learning outcomes in educational settings (see fig. 1). Knowledge as the base foundation cognitive level includes the identification, recall, and retention of specific information, i.e., facts and definitions. *Comprehension* requires more cognitive processing than simply remembering information, and learning objectives that address comprehension will help learners begin to incorporate knowledge into what the terms or definitions mean relative to a subject. Application, is the ability to use the terms and concepts in problem solving. Analysis include distinguishing between fact and opinion and identifying the claims upon which an argument is built requires critical thinking, as does breaking down an information needed to form conclusions. Synthesis, which entails incorporating and framing a complex problem creating a unique or new solution. Evaluation would be the process of reviewing the work, plan, proposal or project to determine or assess how or did it meet the intended outcomes and question the intended outcomes. Bloom's Taxonomy was later revised based on cognitive science studies by Anderson and Krathwohl. In their alternate version, the levels are revised to remember, understand, apply, analyze, evaluate, and create. This reorganization places the skill of synthesis as to create or design rather than evaluation at the highest level of the hierarchy.[2] This revised hierarchy places 'Create" -formerly titled Synthesis – at the top of the cognitive achievement pyramid giving new credence and a higher level of intellectual achievement than the first version. Design based studies now enjoying a new level of recognition. The author unfortunately has not found many faculty in architecture embracing nor celebrating this change in status where in secondary education design or creative studies in Art or Music were classified as 'non academic' fields

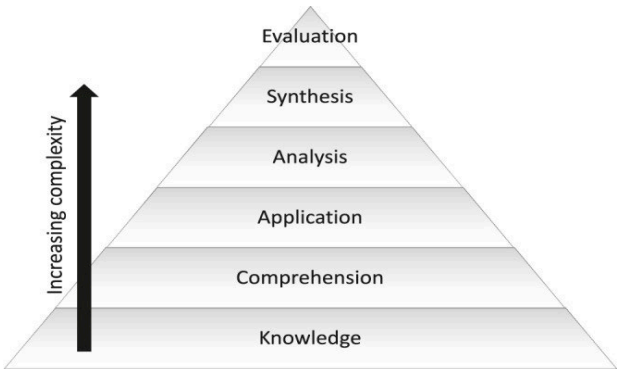


Figure1. Bloom's Taxonomy, 1956.

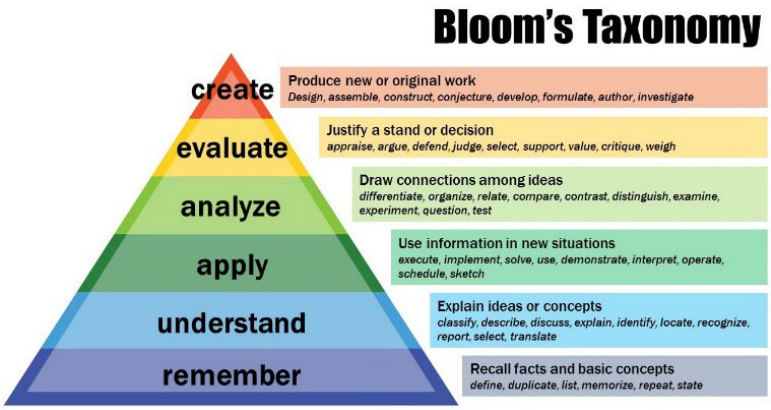


Figure 2. Blooms Taxonomy Revised 2001 Anderson & Krathwohl.

Cognitive Domains in Architecture

If architectural education is professionally based and centered on knowledge what domains of knowledge could be categorized and understood as established within the field? The outline below suggests a generic framework/categorization model. The pedagogical and curricular purpose would be to establish a set of unified educational experiences in all design studio classes that demonstrate a consistent set of topics which are the basis for scaffolding the educational outcomes, learning experiences. This would lead to the knowledge development needed for understanding of the field of architecture and related fields of inquiry demonstrating professional competence. Courses would be developed as a set of cumulative-based tiers of coursework that builds the students skill sets and knowledge to engage larger and more complex (either in size and scale or depth of resolution) architectural projects through problem-based learning. Course outlines, learning objectives, and assessment based rubrics would be based on Bloom's Taxonomy revised to establish a scaffolding and hierarchy of achievement. The author proposes the following domains.

Primary Cognitive Domains

A. Design Methods and Strategies (organizational frameworks/meta-domains): Instruction is on the meta process level organizational formats that are cognitive and value based to guide the design process including the following: Academic and professionally based theories, models, procedures, for problem identification and problem solving processes, and where appropriate methodologies that demonstrate established research protocols.

B. Human Factors/ Social Considerations (disciplinary domain): Focuses on the environmental and architectural design responses to functional human needs based on pragmatic user needs, socially or cultural based norms or traditions including provisions for sustainable resource equity, and other issues that address improving the quality of life as part of the human condition.

C. Health, Safety and Welfare (disciplinary domain): Addresses those standards established through building and zoning codes, and those professional codes which are codified, practice-based, and employ evidence-based standards. Including sustainability outcomes that are resource based. The focus is to develop the awareness of the standards of care that demonstrate professionally responsible practices defined by government standards, and professional societies or organizations.

D. Composition, formal ordering principles and methods (disciplinary domain): The outcomes that address visual, tactile, haptic, and experiential and aesthetic values. Theories of geometry/ human scale, proportion/ spatial perception, color, light, materials, appearance and patterns that express the primary vision of the designers as related to intentions, construction tectonics, site relationships, building form and spatial conditions.

E. Construction Implementation and Systems Integration (disciplinary domain): Instruction would address the selection, planning, awareness and arrangements and relationships of the primary building and site systems that are understood from a performance- based perspective.
F. Site, Climatic, and Context Responsiveness (disciplinary domain): Studies concern the methods of understanding and responding to relevant external conditions that impact environmental design projects and the users and biotic communities at multiple scales and dimensions. Solutions addressed may stem from performative factors, social/cultural, ecological, and perception-based objectives.
G. Communication and Documentation Methods and Skills: (operational/technique domains) The outcomes are focused on the development and demonstration of skills relevant to the field of architecture and demonstrate effective methods of oral, written and visual communication relative to providing clear presentations for specific topics/ outcomes.

Hierarchy/Classification by Levels

These categories would be seen in relationship to the following;
Primary Level: (Organizational Framework) Meta Processes for Design Methods. Concerned with Framing the problem, determining an approach or problem solving methods, and processes that leads to a viable solution/proposal.
Second Level: (Disciplinary) Topic/Content areas; Disciplines or fields of study, Primary Sources of Knowledge within topic areas (keywords).These fields of study have their own means and measures of determining truth and the development of expert level knowledge, often measurable and well defined. Architects are not expected to possess a working level knowledge to understand why, how, when, and where this expert knowledge is needed and how to productively engage these experts in the project work process. Firms that value a collaborative (team) or service model approach make this a primary signature aspect of their services. Firms based on the singular reputation of a "master practitioner" or signature architect may see this as secondary.
Third Level: (Operational).The visual, written, and oral techniques and methods that demonstrate designed outcomes and convey the issues considered, regarding how they impact a proposal and clearly measure, convey, or express the issues and objectives undertaken and their interrelation-ships . These methods exist both inside or unique to a field of study (design and construction documents/ specifications) and are also external to it.
The Figure 3 illustrates these domains in an expanded diagram with three of the five disciplinary domains shown.
The issue with Domain Knowledge (disciplinary based) is that while this content is useful and essential to be known at the level of core competency one assertion is it exists at the lower level of the Blooms Taxonomy scale, and 'provides insufficient clues for many students about how to solve problems and accomplish tasks at the domain level" (Collins). The author submits that the reason may be in part because the imbedded values faculty have or are not made explicit nor perhaps as they assumed to be commonly understood or they even recognize their biases or preferences. [3]

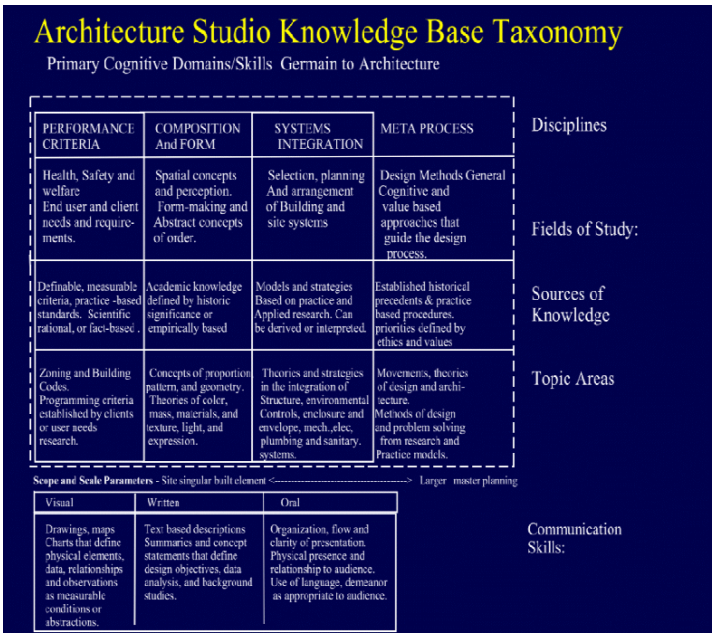


Figure 3. Author's Sample Domain Diagram.

EPISTEMOLOGY IN ARCHITECTURAL DESIGN.

"The initial assumption (within moral philosophy) that a conflict is irresolvable is misguided, because it defeats any attempt to do what design engineers often do so well, namely, to satisfy potentially conflicting considerations simultaneously." ~ Caroline Whitbeck, 1998, p. 56

All professional fields are essentially cognitive or based on and concerned primarily with intellectual abilities. All disciplines have a means to pursue and identify essential knowledge or truth through their epistemology. What is ultimately at stake is the following question. Why should society grant architects the privilege, authority, and responsibility to lead and direct the process of design in the built environment that improves the human condition, contributes to the common good, and will impact the present and future generations? Is it not the aspiration that architecture will address our essential needs with compelling ideas expressed through compelling visual and experiential built projects/places as the result?

The researcher J. Luckman (1967) classified design processes as comprising three stages: "*Analysis, Synthesis and Evaluation*," which is relevant to understand the epistemology (pursuit of knowledge) in design fields. Luckman states that this is done in series or in repeated cycles. *Analysis:* considered as a detailed investigation of a condition or physical element is made in order to measure and understand its essential features, *Synthesis*: Finding possible solutions for each individual performance specification and building up complete designs from these with least possible compromise. The final step is *Evaluation*: or measuring the accuracy with which alternative designs fulfill performance requirements for practical usages.[4] As a parallel to Bloom's taxonomy would *Synthesis* be shifted with *Evaluation* today or could *Evaluation* in architecture be a post project completion assessment as in a post-occupancy evaluation? For faculty engaged in education and research roles the pursuit and advancement of knowledge is critical. This aspect of any field or discipline in higher education, is central for educators to be able to discuss, engage, and form a mea ningful curricula and the courses to implement it.

The scientist discovers a new type of material or energy and the engineer discovers a new use for it."
~ Gordon Lindsay Glegg

The central dilemma however for architecture as a discipline per se is that if Luckman is correct, the pursuit of knowledge itself through the scientific method – the intent of theoretical research in the sciences- is not what defines research in architecture when understood as the act of 'designing'. Architecture may be better described a falling under the category of 'applied research". Arthur Mellen Welling is reported to have said that "Great triumphs of engineering genius—the locomotive, the truss bridge, the steel rail— ... are rather acts of invention than engineering proper." From this perspective applied engineering research then may not be concerned with an activity that leads to an invention (design) unlike perhaps studies in 'technology transfer' as implied by Glegg's quote, but rather one where it is the intent of the applied research is to find an application for knowledge, i.e., finding a new and more accurate means to calculate or measure the phenomena that are central to the discipline; in mechanical engineering e.g, axial stress or temperature effects etc… or those relative to other applied science disciplines.

According to Maureen Trebilcock in her essay, *Integrated Design Process:, From analysis/synthesis to conjecture/analysis,* June 2009[5] She states that Bryan Lawson (1980) asserts that for design to take place a number of events must occur, it is questionable that they occur in order, or that they are separate activities. *He proposes a map of the design process that is seen as a negotiation. Between the problem and solution through the activities of analysis, synthesis and evaluation*.[6] In contrast Ms. Trebilcock states that the rationalist or scientific methods based approach however is called into question by others. Critics (Hillier, et.al) believe that the rationalization implied is in the reality of architecture practice unlike the scientific method as it suggests that design should derive from an objective analysis of the requirements of users rather than from the designer's preconceptions.[7] "Hence in reality, a complete account of the designer's activities during the design process does not often reveal where the solution came from". They propose that the purpose of analysis is to "test conjectures" rather than optimise a synthesis by logical procedures. She states that for them, "design is rather a matter of pre-structuring problems by a prior knowledge of solution types (or typologies- often based on building use) or by knowledge of the technological means in relation to solution types." From this perspective architects rarely invent new buildings rather they derive them from existing models, methods of construction and regulations.

Design Methods for Complex Interdisciplinary Problems

It important that at the beginning of each project there are deliberations at length on notions of region, area, local patterns, cultural and physical resources. In this respect, a multilayered effort at reading, researching and understanding is undertaken in order to reveal the collective and psychological features of the project. Of course this at the same time is a reading that also includes social, economic and ideological factors. ~Architect Emre Arolat, 2015

The architect, Juhani Pallasmaa characterizes the dilemma when architects are faced with as the complexity of issues that arise as "*Architecture is a muddle of irreconcilable things*". Richard Buchanan in his work on "Wicked Problems" states that the foundations on design thinking 'eludes reduction' and does not fit exclusively into the natural or social sciences or can be broadly defined by specific fields. The dilemma of wicked problems according to Buchanan is they are "indeterminate" *because design has no special subject matter of its own apart from what a designer conceives it to be. The subject matter of design is potentially universal in scope, because design thinking may be applied to any area of human experience.*

He defines the four broad areas where design activity is undertaken as follows: *Symbolic and visual communications, Design of material objects, Design of human based collective activities and organized events, and the Design of complex systems or environments for living, working, playing, and learning. This includes the traditional concerns of systems (civil) engineering, architecture, and urban planning or the functional analysis of the parts of complex wholes and their subsequent integration in hierarchies. This area is more and more concerned with exploring the role of design in sustaining, developing, and integrating human beings into broader ecological and cultural environments.*[8] In Architecture addressing dichotomy, conflicts, and complexity in design problems can present challenges but also can be a measure of success. The Theorist Charles Jencks remarked the "James Sterling analyzed a key factor behind his most successful buildings. They were the result of his oscillating between dualities- abstraction and representation, modernism vrs. Vernacular, monumental and informal, tradition and high-tech oppositions he sought to confront and sometimes to reconcile."

The design process as a synthetic methodology has recently being examined by Herbert Simon in "The Sciences of the Artificial" (Simon, 1969:4). Simon compares and contrasts the "natural sciences" and the "science of design." He states, "The natural sciences are concerned with how things are. Design on the other hand, is concerned with how things ought to be." Simon claims design is concerned with "synthesis," science, on the other hand, is concerned with "analysis. However the measure of the validity of the act of synthesis is based on the quality of the background information and the analysis undertaken.[9]

Framing the Problem

The conceptual task of a designer is to frame the problem. ~Donald Schön

Problem definition (framing) and problem solving according to Donald Schön is a central goal in architectural education. Marvin Minsky, referred to as 'the father of artificial intelligence" Describes four levels of frames as the following ;'syntactic frames', 'semantic frames', 'thematic frames', and 'narrative frames'. In these terms, he articulates a distinction between framing activities that propositional (syntactic frames), action centered (semantic frames), descriptive ('thematic') and evocative.[10]

***Narrative Frames**. Skeleton forms for typical stories, explanations, and arguments. Conventions about foci, protagonists, plot forms, development, etc., designed to help a listener construct a new, instantiated thematic Frame in his/her own mind, e.g. can we place many seats in the area in order to have a more pleasant area.*[11]

According to authors in the public policy field, *Narratives both reflect and shape our understanding of the world (Shanahan, Jones, and McBeth, 2015). The NPF contends that narratives are both internally held and externally communicated. Internally, narrative is the mind's preferred method for organizing perceptions, memories, and explanations about the world (Berinsky and Kinder, 2006; Jones and Song, 2014; Lodge and Taber, 2013). Externally, narrative is a powerful communication tool, a device used across groups and contexts (Shanahan et al., 2013). External narratives are shared by people to teach and anchor identities, norms, and beliefs.*[12]

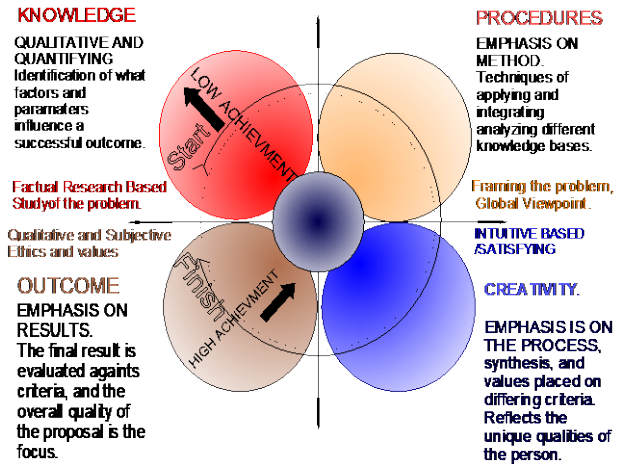
The author adopts an architectural narrative framework in studio coursework at the predesign stage concurrent with project research. Students engage in reading about the project topic at the broadest scale regarding multiple issues; political or policy based, economic, resource, societal issues that are related to the project and asked a series of questions that could influence their framing of the problem. Not all narratives are similar in merit, significance and impact and they vary in depth and meaning. Meta narratives are those which have the largest dimension and impact, often embodying some significant aspects of 'the human condition"**.** They examine the characteristics that comprise the

essential aspects of human existence, such as right, responsibilities, and privileges. They can influence emotions, aspirations, friendships, social or familial bonds, suffering, conflict, ethics and mortality. This requires an understanding of the project which is part of the following disciplines/ fields/works and perspectives, i.e. religion, philosophy, history, art, literature, anthropology, psychology, and biology. To engage these aspects of life is to what brings meaning and fullness to a person's life, defines a nation, community or society and why it is a significant achievement for architects to manifest them in their work. Zaha Hadid remarked that projects involving housing, health care, and education were essential at the societal level. Juhani Pallasmaa's aspiration is that, "A profound design process eventually makes the patron, the architect, and every occasional visitor in the building a slightly better human being."

Kees Dorst and Nigel Cross in their work, *Creativity in the design process: co-evolution of problem–solution.* 2001 explain the value of the time spent during the initial design phase of study as valuable to creative outcomes based on the work of Henri **Christiaans,** Creativity in design PhD Thesis, University of Technology, Delft, The Netherlands (1992) as follows: *Christiaans*[6] *reported from his study that "the more time a subject spent in defining and understanding the problem, and consequently using their own frame of reference in forming conceptual structures, the better able he/she was to achieve a creative result". Defining and framing the design problem is therefore a key aspect of creativity.* It is important in the overall process to devote ample time to this initial effort and phase of the project. [13]

INSTRUCTIONAL PEDAGOGY FOR COMPREHENSIVE DESIGN IN ARCHITECTURE

What makes me tick is an aesthetic sense of order, of essential simplicity behind apparent complexity. As an artist, it is possible to create exuberant and unique objects from a small and limited set of elements and rules; as a scientist, it is a challenge to discover a simple explanation for complex behavior, a general causal structure for a series of related but unique events. In this view, science and art are both aesthetic activities: only the direction of the approach differs. ~ Lionel March



Model of the studio design process.

A model is by definition that in which nothing has to be changed, that which works perfectly; whereas reality, as we see clearly, does not work and constantly falls to pieces; so we must force it, more or less roughly, to assume the form of the model
Italo Calvino

Figure 4. Author's Design Process Model Diagram.

The author's approach is represented in the model diagram. The intent in the architectural design process is based on staged exercises that reduce the overall complexity to the essential conditions to be addressed at the appropriate time that embody both the pragmatic problem issues and architectural language of composition in a process of coordinated fit. An architectural concept establishes order to define the purpose of the project in a manner that provides intangible benefits, meets pragmatic objectives while incorporating the elements that define the relationships of spatial/site conditions and meets building performance outcomes. The inner circle is representative of high achievement as synthesis and integration of the outer circles represent the four design phases and their areas of emphasis and segments in the process.

The first module (Knowledge) is the development of the knowledge base needed to address the essential issues embedded in the project and the course educational objectives. Teams and individuals collect present and archive their research, Research tasks are accompanied by outlines, documentation formats and research methods, and expert references. Presentations are made and studies are made available online to all students.

The Second Module (Problem Framing/Initial Design) is based on a process based on a descriptive examination of procedures for engaging in the design work as follows; development of a Narrative framing of the problem, working with four prescribed design methods, and four typologies of form/composition. Three proposed alternatives are developed all based on varying Methodologies/ form typologies and generic conditions; site, program and technologies. The focus is on divergent thinking and exploring multiple options based on the design methodology, formal ordering typologies and priorities from narrative framing. The research informs the process but is staged to avoid cognitive overloading.

The Third Module (Design Development) is based on consolidation of aspects of the options or identification of a selected preferential option. This establishes a a new direction in convergent thinking and is a result of the review and dialog engaged in the second module with faculty and guest reviewers. In this phase more explicit and developed work results and students draw on relevant past research as needed, regarding building code, program, site, bioclimatic conditions, and performance based metrics for sustainability (LEED).

In Module 4. (Final Design Proposal) The project development is largely in its final form and major decisions have established the direction, the emphasis shifts to emphasize systems integration, energy and daylight modeling design development of construction and assessment of potential LEED credits. The Lab component of the class, associated with factual performance-based outcomes for systems and building code compliance is now dominant.

Architectural Design Methods, Four Generic Models

Professor Robert Oxman in his work "Towards a new Pedagogy (JAE/39/vol.4) "recalls the work of Sir John Summerson who argued for a 'comprehensive theory of architecture without which the derivation of form appears arbitrary". Prof. William Mitchell of MIT proposed that 'we must regard designs as results of the logical intersection of a list of requirements *with a language of architectural form'.* Oxman states that; *The value of the design studio-* or project based education *in a curriculum is that it serves as a vehicle for students to learn through the acquisition, and application of knowledge and associated generative* rules that through study and *redesign of the configuration of form that leads to the understanding of design as an act of synthesis.* [14]

The design process as a synthetic methodology has recently being examined by Herbert Simon in "The Sciences of the Artificial" (Simon, 1969:4). Simon compares and contrasts the "natural sciences" and the "science of design." He states, "The natural sciences are concerned with how things are. Design on the other hand, is concerned with how things ought to be." Simon claims design is concerned with "synthesis," science, on the other hand, is concerned with "analysis. However the

measure of the validity of the act of synthesis is based on the quality of the background information and the analysis undertaken. [15]

This process of design as synthesis is based on how a student integrates the various fragments of knowledge together. Robert Oxman cites that this process can be defined as one of four models.

Canonic: where an existing *parti* (the basic scheme or concept of an architectural design.) is emulated. In his essay Marcus Breitschmid, Ph.d , 'In Defense of the Validity of the "Canon" in Architecture ' states that "Our argument for the canon's validity is based on three credos: a) the autonomy of the discipline, b) the merging of the excellent and difficult with the popular, and c) the interplay we seek between the fluidity of our appreciation of historical events and the stability of orthodoxy." [16] Canonic examples are often rare and as an alterative Precedents or Archtypes are also allowed to be selected. The danger of precedents is their mis-application or misuse. Original works of architects should allow the architect to retain the characteristics of their work, working from a conceptual level is encouraged. Riva Oxman states that, "According to Akin, referring to the domain of architecture, conceptual abstractions derived from the precedent are those which bridge between the conceptual and the physical and thus provide the basis for exploiting the conceptual knowledge of precedents.[17]

Prof. Rivka Oxman Examines the use of precedents in architecture as comprised of the following aspects or "Chunks". A "Design Story" is – "an annotation of the conceptual design as manifest in the specific precedent**.** A "Design Issue- " is a point related to the design task at hand deliberated by the designer an issue is an extension of the Design Story and stems from it. "She defines a "Design Concept as the formulation of a design idea in relation to a Design Issue. The concept has physical implications related to the project but is not a physical solution. Design form is that physical or architectural element based on the concept." See figure 1 at right.[18]

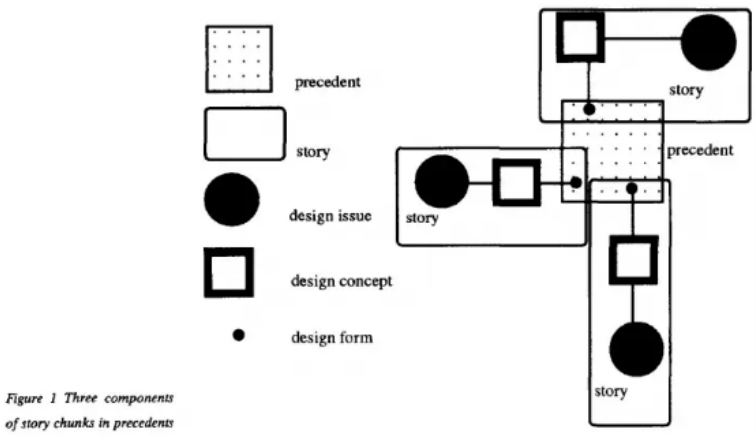


Figure 5. Riva Oxman, Diagram of Story Chunks to Precedents.

Metaphoric: The Architecture critic and prof. Simon Unwin states that *"Metaphor is the most powerful* component of the poetry of architecture. It has been a significant factor in architecture since the earliest periods of human history, when people were finding ways to give order and meaning to the world in which we live."According to Hernan Pablo Casakin, "In design, metaphors are viewed as heuristics (method of problem solving) that helps organize design thinking and tackle ill-defined design problems (Antoniades, 1992; Rowe, 1987). In this methodology Robert Oxman states " a form or gestalt emerges, i.e., a configuration, pattern, or organized field having specific properties that cannot be derived from the summation of its component parts; a unified whole. In the book The Poetics of Architecture: Theory of Design, Antoniades (1992:30) The author distinguishes metaphors

in three broad categories: intangible, tangible and combined. The intangible metaphor is an abstract idea whilst the tangible metaphor is a visual or material representation.

*"*Design research is systematic inquiry whose goal is knowledge of, or in, the embodiment of configuration, composition, structure, purpose, value, and meaning in man made things and systems*"* . ~Nigan *Bayazit*

3.Systematic: This approach in spatial or form based terms is according to Prof. Robert Oxman is"where a modular, or geometric, regularity is imposed upon the problem". Modular design is an idea that could conceivably be traced back to J.N.L Durand and the Polytechnic College of Architecture in France where a module was considered a means to link building form and construction methods to reduce complexity and costs of building. Modern origins of this approach stem from the work of Horst Rittle from the 1960s. Aspects of this approach draw heavily on the work of C. West Churchman, the operations researcher and philosopher. (Don.P. Grant) Scholars today have recognized the importance of the dynamic tensions between creativity and rationality in the design process. Innovation requires both creativity and rationality, synthesis could be considered as the act of finding relationships and the ordering of priorities between these two cognitive processes considered to be mutually interdependent and should not be considered as separate (Kroes, 2010, Casakin, 2008, Wankat and Oreovicz, 1993). [19] In current firm practice, Kieran/ Timberlake are cited as having a 'systematic process' as based on their work with Louis Kahn. They work from a perspective that "space is inseparable from the systems that serve it". James Timberlake reports that " an incremental structural unit is often a starting point often related to a dominant room or repeated spatial unit." They characterize their work as a series of systems formulated around a "Unit/building block, Assemblage of spaces, Building systems and their integration, Floor plans and Site."

4.Syntactic: *A process in which a formal language, or some structural pattern, established. This structure and its generative rules the basis of process of fit*. According to Oxman: " The syntactic process tends to deemphasize the experiential (how space and form are experienced or a stereotomic method of design), or phenomenological, (to approach the "essence of things unburdened by convention or intellectualized explanations", Juhani Pallasmaa) as a basis for design. The approach is conceptual and can employ abstraction to realize the symbolic and structural aspects of form. Emphasis is placed upon appropriate formal structures for the problem. In this regard the form can be derived from the programmatic spatial requirements, building systems, and or site conditions or where the 'language of architecture' is developed as a rule system.

Spatial Typology Strategies of Form, Composition and Order:

Type is the very idea of architecture, that which is closest to its essence, whereas typology is the analytical moment of architecture. ~Aldo Rossi

According to Robert Oxman: "Competence implies knowledge of design languages as well as of processes of transformation and application. Architectural competence includes the ability to distinguish and manipulate basic organizational structures and formal generative rule systems in architecture." The architect and professor Louis Kahn in his writings placed emphasis on the following points in architecture and education;" What is important in architectural design education is to convey principles. "Architecture is more about composition than design." He states that "the purpose of the architect is to establish order." To establish a design based on spatial and visual concepts that demonstrates an understanding of central issues in the project as translated and manifest in architectural strategies of composition is a central goal in architecture and initial stages of the formation of a concept.

Typology as a method of design is generally considered related to functional classifications of building type. In the case of housing a form and organizational type is identified, i.e. a row house. This becomes the basis of the initial design. The assumption is that this model is a valid type and need

not be reinvented. Originality or innovation occurs in another aspect of the design. The other definition of typology as in a formal compositional ordering types in design is based on form and composition. The following four classifications have been attributed to the architect/ educator Edward Baum and Hanno Weber as follows: *set piece, cellular, elemental and figural* and are describe as follows. This is not an exhaustive list of architectural composition and form, most buildings are not derived soley in their form or composition on these models but are often hybrids.

1.Set Piece: A Set Piece composition is one where the building and natural environment exist with clear A distinct relationship exists in how the building meets the ground, often a plinth or elevated structure (datum) is used. They are symmetrical in form and internal organization, based often on platonic geometry. They can be difficult compositions to add to as they are considered singular, complete and whole forms. Often see as a pre-modern approach, yet many contemporary projects still adopt this model.

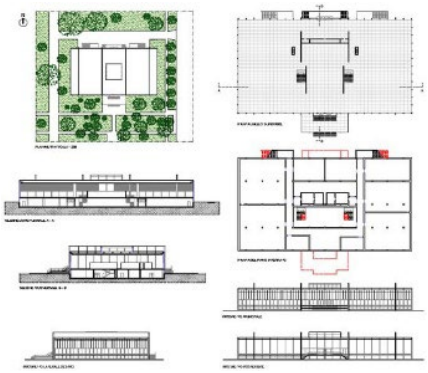


Figure 6. Crown Hall, IIT Campus, Mies van der Rohe

2. Cellular or Modular : The term implies an organic approach to design not unlike the natural process of organisms that replicate cells to grow and is considered wholistic. The term also describes buildings which have the following characteristics; they are an aggregation using cell or module which is three-dimens ional and incorporates spatial/ structure/mechanical and enclosure systems.

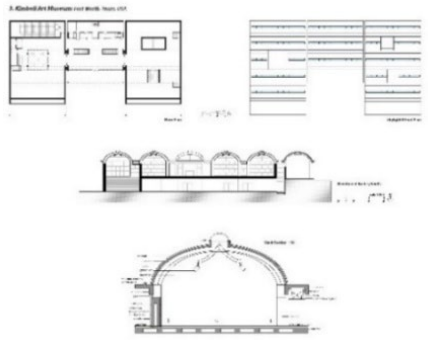


Figure 7. Kimbell Museum, by Louis Kahn.

3**. Elemental:** An elemental composition is one where the exterior forms are developed as distinct elements or forms, and they are related to specific internal programmatic uses. Circulation elements are often articulated; stairs, corridors, and elevators. Materials or colors also are often varied with each distinct form and use. They are easy to add to and circulation corridors are often expressed as spatial links.

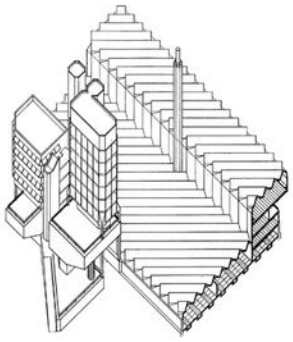


Figure 8. Engineering Building/ Leicester Univ., James Stirling and James Gowan

5.Figural: A composition based on spatial overlapping of internal spaces, forms, and varying shapes. Painting by Juan Gris, Georges Braque, and Picasso contain figural compositions. These shapes typically have differing geometries, linear and curvilinear or orientations. The overlap of space and form occurs usually at multi-story open spaces and communal areas. Both geometries have to be revealed in the space as in the overlap in the ceiling, wall or floor. Varying geometries may be the result of the site and context, and internal organizational ideas of the main building proper.

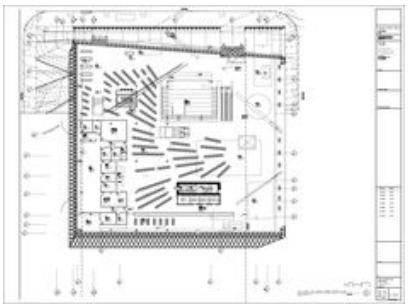


Figure 9. Seattle Library OMA Architects, 1998

CONCLUSION

The Architecture Program revised the first-year studio to include an emphasis on Design Methods. The Curriculum for the Design Studio sequence continues to be in flux. In the USA the NAAB 2020 criteria for accreditation include outcomes related to "Design Synthesis and Systems Integration" which are central to this courses educational outcomes.

The focus of the paper is on the outcomes in the Concept Formation Module 2 in the senior level (Capstone Class) Comprehensive Design Studio. The Assessment of the course over six years indicated this module proved to be the most difficult and having the lowest overall achievement levels when compared to the other modules. The Architecture Department program recently revised the first year studio sequence to focus on design methods. The Module 2 for Comprehensive Design course is currently in revision by the author to reinforce the link between the Narrative Problem Framing assignment to the initial design phase and also to reduce the complexity in the generation of design alternatives to address student difficulties by streamlining procedures and reducing the over ambitious scope. The focus in design studios continues to promulgate a master apprentice model where objectives and outcomes while shared are left to the instructor to determine the approach, theories, and methods employed. This provides difficulties and consistency between course sections and in turn leads to difficulties in linking skills and knowledge to other courses to provide a scaffolding or building on prerequisite class content.

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DESPITE DISRUPTIONS: THE RESILIENCE OF THE DESIGN STUDIO MODEL

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INTRODUCTION

Everyone remembers their first year at architecture school, but what makes a memorable year a great one and how can this be perpetuated in a distributed and digitally connected context?

Reflecting on over a decade of leadership, this paper introduces and discusses how a progressive design studio framework and a focus on personal trajectories have formed the basis for the pedagogical evolution of first year architecture (BA1) at Manchester School of Architecture (MSA). Each year, MSA welcomes one of the largest and diverse cohorts of undergraduate architecture students in the UK. This diversity is an essential component in architectural education and creative production and staff have dedicated much attention to developing pedagogies which both nurture individuality and allow large cohorts to develop the necessary professional skills and knowledge base required to successfully proceed through the course and into professional practice.

Diversity is recognised and celebrated in design studio as a necessary starting point to facilitate discourse on global and local challenges and international mobility. This has recently been contextualised by significant global disruptions and the COVID-19 pandemic served as an insightful opportunity to test the limits of an established pedagogy. This paper reviews the opportunities and drawbacks experienced during the pandemic, from the abrupt shift to remote delivery through blended modes and a return to in person teaching. Amplified experiences of physically distribution and smooth digital connectivity have afforded an evaluation of studio activities and studio spaces. This paper describes how foregrounding the individuality of students and expertise of staff provides a broad and supportive knowledge base for developing design thinking skills. It discusses the considerations needed to deliver digitally enabled and connected modes of engagement and recognizes the value of physical space for peer-led activity as a cornerstone for this. Drawing from these experiences, the paper speculates on the possibility of a connected model for architectural education that offers new forms of experience and richness to support the development of future architects who are undoubtedly destined to operate in a connected and global workplace.

EDUCATING A PROFESSION

Undergraduate architecture at MSA an established Bachelor of Arts course, validated by the RIBA and ARB. This requires the programme to meet *Criteria for the Prescription of Qualifications* set by the Architect's Registration Board[1] and demonstrate that it meets the standards necessary to prepare students for professional architectural practice.

Pedagogy

Architecture is one of several design disciplines recognized for its *learning by doing* approaches to teaching and learning.[2] Pedagogy in architecture is inherently practice- and outcome-focussed[3], not only recognising that students learn through doing, but that such learning environments can be tailored to simulate professional practice (pedagogically known as constructive alignment[4]); thereby delivering key professional and employability skills through the experience.[5] Pedagogies which emphasise questions, rather than answers create the necessary environment for learning through applied practice and reflection-in-action. This approach emphasises the importance of gaining experience through practice and is founded on the principles of constructivist learning theories. Learning through problem solving, is how Weaver[6] (and many others across the design disciplines) argues that the necessary skills to think 'like an architect' are learned.

Constructive Alignment in Action

Each year around 200 students join BA1 at MSA. Cohorts are typically made up of 40% international students, bringing together a wide range of backgrounds, disciplines, and skillsets. Teaching and learning at MSA is centred on the principles of constructive alignment with professional design practices. This begins in the organisation of student groups and tutors, which endeavours to capture a mix of gender, international and academic backgrounds to enable students to share skills, experience and knowledge. Teaching is organised on a 1:12 staff to student ratio with staff working in pairings featuring the complimentary skills of a practitioner and a member of academic staff. This broadens the peer group for students, provides direct access to practitioners working on live projects as well an academic staff actively engaged with funded research. The rotation of pairings at strategic points throughout the year introduces students to varied teaching styles and a range of specialisms, expertise and roles available across the discipline.

STUDIO FRAMEWORK

The authors' combined experience spans a decade and includes teaching on the programme as fractional Associate Lecturers through to full time year leaders. Since 2014, careful and incremental changes to an already successful model have been made in response to growing student numbers and diversity, as well as developments in professional regulatory criteria and institutional frameworks. Throughout, the recognition of students as individuals has always been a central concern, and changes to the curriculum has been based on collective staff expertise and student feedback.

The MSA course structure comprises four core subject areas – Humanities, Technology, Professional Studies and Studio - designed to cover ARB *General Criteria* and the *Themes and Values for Architectural Education* and *Mandatory Competencies* of the RIBA Education and Professional Development Framework.[7] Studio is the arena in which design activity brings together knowledge and skills developed in Humanities, Technologies and Professional Studies. Designed to equip students with the capacity for critical thinking and creative problem solving, studio is constructively aligned to emulate processes and outputs typically experiences in professional practice.[8] For students without education in art and design disciplines, this can be an unfamiliar concept and is therefore considered critical to establish the principal concept of studio as both an activity and an environment which underpins contemporary design practice.

Design Briefs

Studio tasks and outputs are a carefully considered aspect of the course. These should introduce students to practice conventions, such as the ability to communicate ideas through conventional and creative drawing and making techniques. They should also facilitate critique and discourse around topical, contemporary and global challenges and conditions. Reflections on the development of Studio

design briefs since 2014, has exposed some core principles for allowing individual students to build on their knowledge and skillsets:
1.Familiar and recognizable topics
2.Connected and incremental trajectories
3.Site/ client specificity

Familiar and Recognizable Topics

Initial projects have provided students the opportunity for personal engagement with a topic. The subject for initial projects builds on the framework for foregrounding diversity and individuality established in the organizing principles of staff and student groups. Briefs have tasked students with designing spaces for personally familiar and recognisable subjects. In 2014, this was put into practice by setting students the initial design task of imagining a highly specific habitat for an animal of their choice. Removing the human dimension to architecture required students to question specific needs, comfort, behaviour, and character of their chosen animal. Other starting points included asking students to design a listening chamber for a piece of music of their choice, or design a performance pavilion for a certain dance style. Music was found to be a particularly successful icebreaker at the start of the year and outputs were varied and unique. As well as a basis for a design challenge the shared brief gives students the opportunity to get to know one another and invites inventiveness.

Connected and Incremental Trajectories

Subsequent projects progress in scale and complexity to include human clients. Drawing from lived experiences students are asked to re-evaluate spatial capacity and potential. Project trajectory has typically followed a sequence of designing single, relatable and multi-programme spaces, as shown in Figure 1.

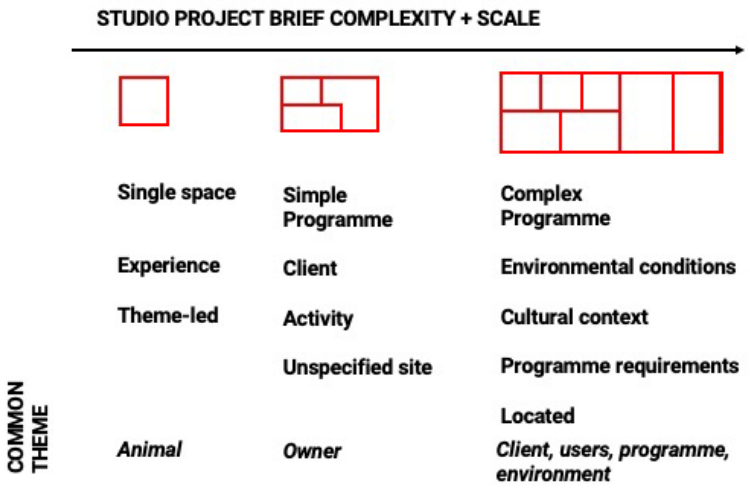

Figure 1. Increasing complexity of studio projects.

Single space – the first projects typically involve designing a minimal space for single occupancy. To design a space for a particular animal, or for someone to listen to a piece of music challenges students to invent and interpret unprecedented needs, thereby developing skills in defining and proposing solutions to purposefully ill-defined or wicked problems.[9]
Relatable – familiarity is important and the design of a living space offers a relatable concept which all students have experienced, albeit in a range of circumstances, climates and cultures. Pairing a familiar concept of “home” to more novel criteria, such as constrained dimensions or the need for a

mobile design, challenges students to think critically about something they already know and pushes them to develop original proposals.
Multi-Programme – final studio projects for the year require a triangulated response to site, client and user. For the theme of music, a live client - Manchester Digital Music Archive - was introduced. Originally, this project commenced in the second semester, foregrounding groupwork and site analysis. Later developments introduced a change of topic in the second semester, requiring students identify an object from their country or hometown and design a building to make, sell and educate people about this object. Introducing a new theme in the second semester had the advantage of renewing enthusiasm and interest for students and enhanced the introductory conversations across a new set of student-tutor pairings.

Site and Client Specificity

Site is used to challenge students. Some projects are site-specific focussing on contextual elements and how the building or programme relates to the site. Other briefs required parasitic or moveable responses, offering a selection of potential sites. This provided the additional challenge of considering mobility and services as well as their supporting infrastructural networks. Others were entirely site-less, with a focus on client or user requirements.

Studio Environment

MSA studios are located in the Chatham tower, part of the Benzie Building on the All Saints Campus, which is also home to the Manchester Schools of Art, Design and Fashion. The location and disciplinary mix provide a lively and rich experience for staff and student collaboration. BA1 has day per week of formalized studio teaching activity which is supplemented on Wednesdays by additional skills sessions led by Graduate Teaching Assistants (GTAs) with input from staff and external collaborators.

Formal and Directed Activity

Studio teaching includes a range of activities, including tutorials, seminars, reviews and lectures, in addition to workshops, fieldwork, and groupwork. A typical teaching studio offers space to present and discuss work in all formats; whether digital, paper-based or three-dimensional. By 2016, digital capability was universal across the BA1 cohort. To support this studios are equipped with large format TVs and projectors, as well as pin up space. Furniture is unfixed, meaning that spaces can be configured according to requirement.
Studio outputs in all modules introduce and encourage the use and selection of appropriate methods of graphical communication by students. In acknowledgement of universal computer literacy and design software, the decision was made to transition to digital portfolio submissions. This was common practice for all upper year groups, but the opportunity for BA1 to submit a physical portfolio remained possible up until 2016. The transition to digital submission did not reduce hand-made outputs (drawings and models) or diminish the quality of them. Instead, these were captured and presented in the digital portfolio.

Self-directed and Informal Activity

Studios are designated either as teaching studios or open studios to identify spaces for informal or self-directed working. Open studios are available for any student to work in at anytime during building open hours (the building is not open 24/7 to encourage balance and allow time for extracurricular activities). This creates opportunities for BA1 to interact with other year groups, including Master's students. This produces the opportunity for chance encounters and peer-to-peer learning. Open studios provide a mix of computer stations and desk space to work on personal

laptops. Importantly, open studios are equipped to enable group and large scale or practical activities, such as simple modelmaking (specialist workshops are available in addition to studio space, to support making which requires specialist tools and machinery). To support these activities additional secure and open storage furniture is provided for storing materials and models. Open studios are considered critical spaces that support located activities – i.e. activities that cannot be done anywhere else – or are more difficult to accomplish off campus, in personal accommodation, or, alone.

RESILIENCE

The abrupt transition to remote teaching delivery as a consequence of the COVID-19 pandemic, prompted the re-evaluation of spatial resource. Initially, this was to minimize disruption and perpetuate the studio experience as much as possible. The value demonstrated by digital and connected platforms has subsequently provide insights into how teaching and learning experiences can be enhanced through these methods, indicating how to maximise the benefit of located activity.

Figure 2 shows a snapshot of some of the more typical activities that happen in the studio spaces. This ranges from formal events, such as review, to public events, such as the end of year show – an annual event to showcase and celebrate graduating year groups and research. The idea of studio as activity and space enabled us to consider the kinds of activities and spatial functions that happen, allowed us to think about how to enable activities in a virtual space. Through this mechanism we were able to re-evaluate where spatial resource was most necessary for those activities which are location specific, such as the open studio. This section reviews the studio framework described above, to identify how studio activities was either replicated, adapted or replaced.

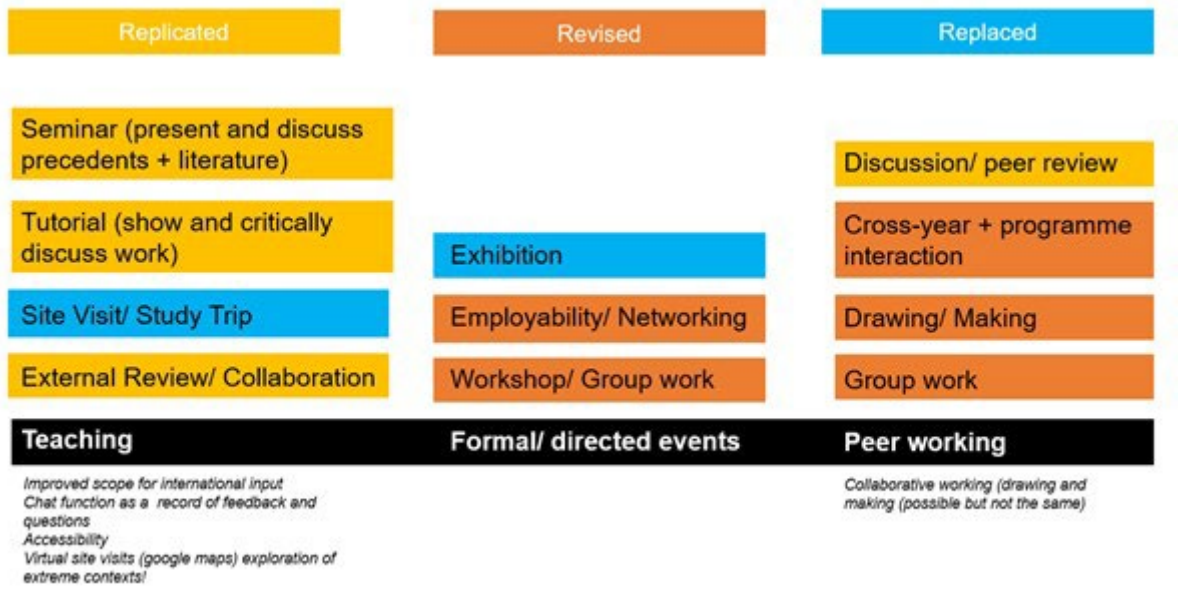

Figure 2. Categorisation of studio activities, acknowledging their spatial requirement and the effect of remote delivery.

Replicated

The largely screen-based studio format at MSA was a significant advantage in the transition to remote delivery as students were already familiar with optimising presentations for on screen viewing. Lectures, seminars, tutorials and reviews were all made possible with a combination of MS Teams, Zoom and Miro. Peer-to-peer and discussions were enabled through breakout room capabilities. Particularly successful was the use of the chat function, which revolutionised student questions and appeared to dissipate anxiety and unwillingness to be the first one to hold up a hand up and ask a

question during a lecture. This brings into question the lecture theatre as a physical space, perhaps the most daunting of settings for a BA1 student in cohort of 200. Other benefits which have been widely documented elsewhere, included the ability to connect with external collaborators in a low carbon and cost effective way.

Revised

Workshops and groupwork were still possible but needed some adaptations to be effective through remote delivery. This required some additional equipment, such as web cams and microphones to support recordings of demonstrations. Tablets with hand drawing functionality also proved useful for demonstrations, remote mark up and live feedback. Ideally, the future studio would support remote connectivity with hardwired video conferencing features that would enable broadcasting and delivery.
Continued uncertainty in 2021 provided a test bed for a mixture of delivery mechanisms. Large group teaching formats, such as lectures, were typically held remotely because the capacity of lecture theatres could not accommodate social distancing for the size of the cohort. Smaller scale teaching adopted blended modes to ensure inclusivity for those shielding or self-isolating. One development has been that skills-based sessions now broadcast lectures online, to groups in the same physical studio space with a tutor in same space for queries and support.

Replaced

Some parts of the course required complete reconfiguration, namely activities which are location specific. This was approached as a creative challenge by staff and students. Study trips and fieldwork, an annual feature in the academic calendar, were not possible under restrictions. At MSA, BA1 used a virtual map of Manchester, to encourage students to look at the city through a virtual lens. ‘Treasure Hunt’ style competitions replaced some of the curiosity and investigation which normally takes place during fieldwork. At Queen’s University Belfast, under lockdown restrictions, a virtual study trip was trialled. This presented unusual opportunities to explore parts of the world that are difficult to access, such as Scott’s Hut in the Antarctic, and proved an interesting exercise, but not a replacement for located experiences.
Events such as the End of Year Show were reconceptualised as a digital web-based presence. However, the lure of reconnecting with colleagues to recognise and celebrate student accomplishments over warm wine is back in full force in 2022, with web-based formats now established as an additional feature to extend international reach and provide students with an online professional portfolio.

MOVING FORWARDS

These reflections suggest a connected studio is possible. Models which support location specific activity would enable students the opportunity for memorable experiences. To be realised, this requires an understanding of location specific activities, where these feature within programmes and the kind and quality of space required to support them.

New Foundation at MSA

A new Year 0, or foundation to the BA is in development at MSA. This specifically focusses on irreplaceable activity, experienced through building visits and city exploration. Focussing on space, scale, climate through study trips, practice visits, construction site visits, as well as peer-to-peer engagement the course aims to capitalise on the opportunities explored over the past few years.

Connected Studio Model

Funding secured from the British Council will support transnational co-teaching in Architecture between the American University in Cairo, QUB and University of Salford. The project will bring together undergraduate students in Egypt with postgraduate students in the UK to explore decarbonisation in historic environments. Transnational collaboration will expose cultural and climatic differences to be considered in responding to the global climate challenge, in addition to affording international comparison of design disciplines and professional practice in anticipation of new mutual agreements facilitated by The Professional Qualifications Act which will allow the ARB to "enter into mutual recognition agreements with other regulators".[10] Transnational collaboration in design projects therefore prepares students for international professional contexts.

The principle of Connected Studio capitalises on the experiences and advantages of remote working combined with the successes of located activity. Collaborating across time-zones and organising activity around multiple academic calendars presents some challenges, however, with the support of new hardware, a programme of digitally connected events, fused with located, in-person workshops, is currently being tested and will run until June 2023.

CONCLUSION

This paper has discussed the evolution of studio projects and a studio framework that proved to be robust enough to withstand significant disruption to teaching and learning formats. This was the case for the existing cohort in 19/20 (which transitioned to remote delivery during the course of the year) but also the incoming cohort of 20/21 (which launch during COVID restrictions).

Robustness was a product of;

- established practices in screen-based presenting, which provided a smooth transition to the videoconferencing format;
- modules and briefs which foregrounded student ownership and individuality, and;
- agile delivery structures which enabled a smooth transition to remote working and uninterrupted delivery.

The experience of the pandemic has shown that one of the most important aspects of a studio framework is to enable peer working. Attempts to replicate this during lockdown had varying success, depending how well groups were established. We conclude that peer working therefore must be a located activity. On campus this requires quality spaces which can accommodate the breadth and scale of design activity. Off campus activities include the opportunities for shared experiences, through visiting buildings and unfamiliar spaces.

Experiences have indicated that some elements of architectural education are much more difficult to replicate in a virtual environment than others. The forced move to complete, yet temporary, remote delivery, strengthened many aspects of the programme that are particularly relevant in a growing networked professional context. The development and testing of The Connected Studio model intends to explore and report on this context to propose possible future models for architectural education.

NOTES

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PLANNING AS EVOLUTION: RADICAL PEDAGOGY, CREATIVE METHODS AND URBAN RESEARCH.

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INTRODUCTION

For many years now, there has been critical reflection at international level against excessive specialisation; the phenomenon has been questioned for various reasons and from various points of view. This critical trend prompts us to pursue other paths that go beyond reductionist thought and beyond specialisation. Within a theoretical framework that embraces a complex epistemology, urban planning is undergoing radical change by opening itself up to critical urban theory and practice. This powerful, ongoing transformation in urban planning is well expressed by a large group of intellectuals who recognize the discipline's fragility and have decided to oppose the excessive specialisation of the modern world in order to grasp the vital interconnection between things and the intersection of spaces on disciplinary boundaries where technicism meets concepts, images, symbols, practices and processes. Within this changing paradigm, sensitive approaches and aesthetic rationalities are provoking interest within urban and regional studies.

This paper explores how art-based methods and alternative spaces for learning and knowledge production may help set in motion critical spatial practices and contribute to urban research and planning. It uses the interactive pedagogy of Patrick Geddes, the father of planning, as a starting point. Geddes' pedagogy proposes an engaged planning, capable of setting in motion civically engaging and empowering collective action. The paper also references authors who regard aesthetic experience as a cognitive activity, and is attentive to radical pedagogies which have developed and adopted creative approaches. To explore how we can return to seeing planning as a cultural and creative process that bases itself on community development, I will present my CAP 04015 case study, a three-year long project carried out in the small town of Priverno from 2015 to 2018 which combined art-based methods, radical pedagogy approaches and community planning. At the intersection between art, pedagogy and praxis, this examination of CAP 04015 aspires to highlight how education processes based on artistic and creative methods can help us produce space differently, in a way that is closely connected to citizens' needs and desires.[1]

PLANNING BEYOND THE PLAN

In 1970, in his *Urban Revolution*, Henri Lefebvre highlighted how projects are reduced to graphic and technological procedures, in which «imagination can no longer take flight». He said:

The authors of the projects evidently fail to find the connection between these two opposing principles:

a. there is no thought without u-topia, without exploration of the possible, of the elsewhere;

b. there is no thought without reference to a practice (that of living and use).[2]

Critical urban theory and the framework of radical urban studies which distinguish the post-1968 left tradition brought forward by Lefebvre and others challenge the Cartesian dualism that characterised the production of knowledge and space until the late 60s. The specialisation of knowledge is deeply rooted in Western culture, from Aristotle to Illuminism. It manifests itself most clearly in the 20th century, when disciplines become increasingly disunited and fragmented in the name of defending the orthodoxies of separate fields and it is impossible to find common ground. The critique of this way of thinking questions the hegemony of the scientific method over other modes of the cognitive exploration of reality and the search for truth. It defines an epistemology of multiplicity[3] that has deconstructed predefined categories and abandoned notions such as objectivity, cause-effect and determinism for plurality. This means that phenomena themselves emerge, as Bachelard states, as provisional sedimentations of a mesh of relations. A web of relations is identifiable with aesthetics[4]—the sensibility of relations, a connecting force—that opposes hyper-specialisation with hybridisation, restoring cognitive and formative value (the giving of form) to the metaphorical, the symbolic, and to sensitive perception.

In this perspective, art—as a terrain of connection between things—, in its capacity to read the real in a non-linear paradigm, is seen as an epistemological process that explores the zones of existence in which society moves. Art does not simply explore these areas to record and document but to see beyond, as Paul Valéry suggested. This vision of art follows Dewey's theoretical thread and breaks down the dominant analytical rationality. Therefore it sees the aesthetic sensory experience as a cognitive practice.[5]

Within this framework, even urban planning, reduced as it is to a mere regulatory norm without the utopian potential[6] to imagine better worlds, needs to rethink itself in order to be able to address the complexity of sustainable and equal transformation. This complexity cannot simply be translated by modern tools such as cartographic rationality, technical knowledge and science.[7] It requires new lenses of exploration and new languages which make sense of it by generating plural narratives. There is a desirable future ahead which aspires to treat planning as a multidisciplinary science of territories that goes beyond dualism. In this future, planning becomes a process of collective empowerment, a critical space of mutual learning through experience in a non-hierarchical production of knowledge. This planning attempts to reveal the plurality of the territory by overcoming the boundaries of individual disciplines and the rigidity of specialisms.

Back to the Future: Planning as Interactive Pedagogy

In the work of Patrick Geddes (1854-1932), a key founder of spatial planning, we find our desirable future. Geddes was the first to develop a sociological approach for the study of urbanisation processes. He believed that social processes and spatial form were intimately connected, and that this awareness could be used to shape environmental transformations that would improve the quality of life for all citizens. In a polemic against the positivistic method and the division of the sciences, Geddes proposed a synoptic approach to reality. This synoptic approach replaces the compartmentalised knowledge characteristic of disciplinary specialisations with a comprehensive and synthetic knowledge. According to Geddes, this latter knowledge is the only one capable of restoring reality's organic nature and vitality. By considering planning as a process, he placed investigation at the centre of his proposal, as a tool for knowledge, understanding reality and planning action. It is at this point that the survey becomes a key part of urban planning theory, since it returns the real to its vitality, to its process of becoming. What's more is that from the survey flow the policies that guide planning action and civic design. Only when we know the places, the activities and the characters of the population as fully as possible and, in their interrelationships, writes Geddes, can we adequately and with some confidence address the planning problem. In this «city as evolution» vision, during his

period spent in Indore in central India from 1914 to 1924, Geddes experiments with an interactive pedagogy because «in order to translate an idea into action, it is necessary to arouse and trigger an emotion, without which no thought, however true, can be transformed into an effective act». Geddes enacted this very process during the Indore Diwali procession.[8]

In this perspective town planning becomes a space of education and inspiration, capable of activating a collective and collaborative process of mutual learning for common civic consciousness and empowerment. As Geddes said, «every place has a real personality [...] which may have long been dormant, but which the planner, as guide and interpreter must awaken».[9] We find a similar attitude in some experiences of radical pedagogy spread throughout the 60s that look at the role of alternative pedagogy and socially engaged critical spatial practice for city production through various perspectives, considering the aesthetic[10] experience as a cognitive activity. I am making reference to Danilo Dolci's pedagogical actions in Sicily. Dolci considered «planning as a collective gesture»,[11] as a process of collective exploration that uses the Maieutic Approach RMA—the experience and intuition of individuals—as its starting point. With *Centro per la Piena Occupazione* and the *Centro di Formazione per la Pianificazione organica* in Trappeto, Dolci used this approach to look at knowledge as a key to self-emancipation from systems of domination through the release of one's own creativity. In *A New World in the Making*, which collects some of Danilo Dolci's writings, special importance and relevance is given to organic development and participatory groups by placing these in direct relation with peace, nonviolence and active conscientious objection when building together the new world. It thus establishes new men, new groups and a new planning.

Within criticism of traditional forms and methods of teaching where education is an act of depositing information, students are the depositories and the teacher is the depositor, the paradigm is shifting and increasingly education is being seen as a multidimensional process focused on contexts, communities, social issues and inequalities. Such a radical approach is also apparent in Paulo Freire's proposals for the pedagogy of the oppressed and the pedagogy of autonomy, processes which are attentive to critical thinking and the development of learners' abilities to create and build, rehabilitating the dream and utopia that were cynically erased by neoliberalism. Inspired by Gramsci's organic and transformative intellectual, Freire invites us to think of educational praxis as deeply linked to a political and critical reading of global society, and thus reclaims the emancipatory power of education. A progressive decolonisation of knowledge transmission is looming, and this is also well expressed in Ivan Illich's call for the deschooling of society.[12] In order to get away from the productivity logic of educational institutions, we must also school the imagination to create services instead of values.

A common thread that runs between these theories and reflections is an educational practice that focuses on contexts and embraces concepts such as community engagement, mutual learning, deconstruction of knowledge and political ethics in its actions. This practice also underlines the importance of the social imaginary, critical awareness in relation to collective imaginaries, and collaborative praxis, as well as the importance of processes and people's engagement for the development of new tools and strategies that respond to environmental and social challenges.

It is clear from all of this discussion on planning as interactive pedagogy that there are obvious links between education and planning, and we can consider radical pedagogy actions as critical spatial practice which uses art-based methods and is capable of engaging temporary communities in different kinds of urban-related issues. Both the physical and social space of the city becomes experimental terrain for this radical educational approach and turns education into imaginative reflection. This kind of education is able to rethink space and the environment in a conscious manner and in relational terms. It is also capable of developing an attitude of the gaze,[13] as well as activating processes of transformation and production. It can do this by starting from a plurality of places through critical community engagement.

Art as a Method: Critical Spatial Practices

Attempts to unveil the territory's plurality are made by socially engaged practices, participatory and collaborative processes that work with the public sphere through art-based and creative methods and configure themselves as critical spatial practice[14] for urban and social transformation.

I am making reference to contemporary public art—also known as socially engaged art, community-based art, social practices, collaborative art, relational art—that is born inside the public sphere to question contemporaneity, acting and relating with it in a constant relationship between individuals and space. This kind of art measures itself with its traditions, its unthoughts, its survivals, and experiments and proposes alternative models which are capable of responding to the issues of the present. With its capacity for suspension,[15] art within the public sphere becomes a potentially transformative device, nurturing a culture of participation and interdisciplinarity.

In the same way as the radical pedagogy experiences mentioned above, public art that works with communities potentially impacts territories by stimulating critical processes of understanding reality, deconstructing stereotyped visions and constructing new imaginaries.

Art found in the public space is transversal to every field of knowledge, a force for the modalities and tools of interaction and exchange that fits into a theoretical framework which combines participatory action research (PAR) and—for the use of visual practical-methodological devices—art-based research (ABR). ABR is «research that uses the arts, in the broadest sense, to explore, understand, represent and even challenge human action and experience».[16] In the construction of the artistic process through collaboration, participation, relational and immersive experiences, the idea in this kind of action-research is to «create, examine and interpret art in ways that illustrate both process and the impact of arts and issues on peoples' lives».[17] In so doing, the action-research, as a qualitative applied methodology, «provides opportunities to see new portraits of phenomena, diversifies our perspectives, and emancipates the gaze through which we approach the world around us».[18] It thus increases awareness of important social, political or educational issues. Combining multiple forms, art-based research acts to explore, understand, represent and transform reality on a variety of scales. It proposes to do this through processes of individual and collective empowerment and subjectivation, and by activating "micro-transformations". It also aspires to creating a world that is more aware of the dynamics transforming reality. In these ways it becomes a device for activating new plans and visions.

Cap_04015 (a city) Co-creation Art Project

Through the experience of CAP_04015 we explored how to return to seeing planning as a cultural and creative process based on community participation, empowerment and development. At the intersection between art, pedagogy and praxis, the experience helps us investigate how processes of education through art-based and creative methods can help us know, use, produce and plan space differently.

CAP_04015 was a three-year long project that I carried out from 2015 to 2018 in the small city of Priverno, an inner area in Italy's Lepini Mountains. The project combined art-based methods, radical pedagogy approaches and community planning. In this participatory action-research experience carried out with a group of young 15-16 year old students we focused on the following elements: active exploration of the urban environment and cultural heritage through walking action and art-based processes (to know); active interaction and creative learning between participants and between participants and the urban environment (to foster engagement and empowerment); active interpretation of phenomena (to raise consciousness); and co-creation to imagine new uses of urban space (to stimulate critical and social imagination for planning).

In this project, art is used as an educational device of subjectivation, as a research methodology for the city and as a planning tool. It experiments with a planning approach that uses "illegitimate" language and tries to re-imagine the research and practice of planning as an artistic-cultural planning[19]

in which the long and uncertain process of artistic creation complements traditional research, helping to discover the needs, desires and vocations of the city, and setting visions in motion. In particular, the process initiated with CAP_04015 fits into the theoretical framework of art in research[20] and adopts art as a methodology, using artistic forms to support qualitative research on the city and its transformation.

The general objectives of the project and workshops with the young people were those of getting to know the territory in another way, activating and co-designing collective processes and projects within the public space and experimenting how art and creativity could be devices for learning, experience and transformation.

CAP_04015 used mixed and multi-method approaches. During the project, we used participatory methods based on visual arts, both as data collection and representation. These methods were characterised by a spirit of play, resistance to binary thinking and a tendency to cross boundaries[21] and a specific set of practices that involved research participants in the creation of artefacts and the experimentation of relational processes. The practices included performance, photography, drawing, mapping, walking, performance and environmental installation. We added the classical methodologies of qualitative research such as brainstorming, group discussions, storytelling and interviews to these practices, and approached all of them from a symbolic and creative perspective.

Our premise was educational and focused on training and we looked closely at maieutic education, in which each subject is already a bearer of knowledge. Making use of this premise and framework, the project chose urban space as a laboratory for experimentation and co-creation and there developed a path of analysis, critical knowledge of the territory and urban design and planning using artistic methodologies to co-produce research and imagine answers to the needs, desires and vocations identified by the participants.

CONCLUSION: THE CITY AS A CREATIVE COMMUNITY LAB

CAP_04015 and the experience of art in public space as an informal space of learning and action bring us back to Geddes's processual and interactive idea of planning.

The pedagogical attitude is translated into a direct confrontation with the recipients of the social action. Here there are no models that can be applied but there is instead a passionate willingness to set in motion a collective action of civic reconstruction.

The radical pedagogical approach and the artistic device—in the overlapping of planes and meanings—become tools for breaking down crystallised categories so that they can recompose the territory's stratification starting from life stories and experience. Through art as experience and public space as a common ground of learning and planning, we have tried to investigate the deep reasons that bind people to their territories, giving rise to a reflection on the future that starts from the communities involved in the process.

The use of art and informal learning as an open laboratory on the city's phenomena and its evolution allowed us to stimulate civic engagement, public participation and student community empowerment by helping to collectively build critical awareness around the city's production and planning processes; it guaranteed the involvement of citizens who are usually excluded from the decision-making[22] surrounding city planning.

In this sense, engaged educational and art-based methodologies may be alternative spaces for learning and knowledge production when it is a critical spatial practice and a radically open process. The methodologies may also bring about the following possibilities: the development of unlearning or learning in a transversal way within collective thinking and acting; the engagement of people in different kinds of urgent issues concerning public space and territory; action and development in relation to urgent social issues, beyond the safe zones of academia or art and educational institutions; the capacity to carefully approach different issues and contexts, adopt alternative perspectives and co-

create strategies and tools for urban and social transformation by looking at the city as collective and collaborative evolution. Within this realm of possibilities, the plan is no longer a container or a programme that is pre-prepared for the community's development: instead it is the result and testimony of a process that the community develops itself through collective action.

NOTES

[1] Derek R Ford, *Education and the Production of Space: Political Pedagogy, Geography, and Urban Revolution* (Milton Park: Routledge, 2016), 1-135.
[2] Henri Lefebvre, *The Urban Revolution* (Minneapolis: University of Minnesota Press, 1970).
[3] Edgar Morin, *Introduction à une politique de l'homme* (Paris: Seuil, 1965).
[4] Gregory Bateson, *Steps to an Ecology of Mind: Collected Essays in Anthropology, Psychiatry, Evolution, and Epistemology* (University of Chicago Press: Chicago 1972).
[5] Michel Maffesoli, *Éloge de la raison sensible* (Paris: B. Grasset, 1996); Maurice Merleau Ponty, *The primacy of perception: And other essays on phenomenological psychology, the philosophy of art, history, and politics* (Evanston: Northwestern University Press, 1964).
[6] David Pinder, "In Defence of Utopian Urbanism: Imagining Cities after the 'End of Utopia", Geografiska Annaler, Series B: Human Geography 84, 3–4(2002): 229–41.
[7] Leonie Sandercock, *Towards Cosmopolis. Planning for Multicultural Cities* (London: John Wiley and Sons, 1998).
[8] Patrick Geddes was in India from 1914 to 1924, invited there as an expert in urban planning. In 1917, when a plague epidemic raged in Indore, Geddes had the idea of transforming the procession, from a religious rite with its own sacred path, into a secular rite with a precise objective: to promote public hygiene that would help combat the plague.
[9] Patrick Geddes, *Cities in Evolution: An Introduction to the Town Planning Movement and to the Study of Civics,* (London: Architectural Press, 1915).
[10] Reference is made to the etymology of the word 'Aesthetics', from Gr. αἰσθητικός, 'sensation', 'perception', 'ability to feel', "Aesthetics", Treccani Dictionary of Philosophy, 2009 accessed 1/7/2022
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[12] Ivan Illich, *Deschooling Society* (London: Penguin, 1971).
[13] Giovanni Ferraro, *Rieducazione alla speranza. Patrick Geddes planner in India (1914-1924)* (Milan: Jaca Book, 1998)
[14] Jane Rendell, *Art and Architecture: A Place Between*, I.B, (London: Tauris London, 2006).
[15] Georges Didi-Hubermann, *Survivance des lucioles* (Paris: Les Editions de Minuit, 2009).
[16] Qingchun Wang, Sara Coemans, Richard Siegesmund, "Arts-based methods in socially engaged research practice: a classification framework.", Art/Research International: A Transdisciplinary Journal, 2/2 (2017): 5-39.
[17] Wang, Coemans, Siegesmund, 5-39.
[18] Tom Barone, Elliot Eisner, *Arts based research* (Los Angeles: Sage, 2012).
[19] Tom Borrup, "Just planning: what has kept the arts and urban planning apart?", Artivate 6/2 Creative Placemaking and Arts Entrepreneurship (Summer 2017): 46-57.
[20] Wang, Coemans, Siegesmund, *in the work cited, p. 15*
[21] Helene Kara, *Creative research methods in the social sciences. A practical guide* (Policy Press: Bristol, 2015)
[22] Qingchun Wang, Sara Coemans, Richard Siegesmund, in the work cited

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PROJECT AS ONE ARGUMENT

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INTRODUCTION

'Project as one argument' is a pedagogical and didactical experiment that focus on providing better tools for the architecture student in order to navigate and focus on their projects, through exercises with Stephen Toulmin´s argumentation models.[1]

Working, studying and teaching in the larger scales of architecture (urban design, landscape architecture, landscape and urban planning) requires a great overview in order to frame, focus and conduct a strategic reaction or a design proposal.

In developing urban environments, an array of parameters such as physical surroundings, specific and non-specific requirements, sociological aspects, economy, politics, numerous stakeholders with different agendas etc. creates a high degree of complexity to be taken into account in the project and to be utilized as generative aspects.

In landscape architecture, there is a tradition with storytelling, or establishing a narrative in a given project. This is an approach that embraces the creative and poetic aspects of the field, and can be rewarding when working with a more isolated (simple) issue or project. Furthermore, the loose frameworks of constructing a narrative allows to unfold a more artistic approach within the project. However, when working with a broader and more specific range of requirements with multiple receivers, the precision and argumentation often needs to be more qualified in order to establish a robust and consistent proposal. There is a challenge for the students in moving from the analytical part of the process of their project to the proposing part, when the output isn't only based on reflection upon researched material, but based upon a design based reaction.

Establishing an overview upon the analytical phases, to prioritize and establish hierarchy in order to synthesize an overall structural or spatial concept is a key challenge for the student. Especially when artistic or creative intuition and the aim for creative solutions are the main motivating drivers for the student.

The paper presents the design and results of a didactic experiment, in the form of a workshop which included exercises that asked the students to apply Toulmin´s model for constructing a valid argument and invited the students to consider their research and design process as parts of one overarching argument for the design proposal.

TEACHING CHALLENGE

This paper presents a response to the identified teaching challenge: How can there be established an awareness of the transition between analysis and synthesis (proposal) for the student, in order to focus the project, establish a consistent main concept, and at the same time give space to work both in a poetic, intuitive and pragmatic manner?

When the students move from the analytical or mapping phase into synthesis or proposal phase, the challenge occurs. The challenge already derives from prioritizing elements in the analysis in the process of establishing an overview. On top of that, there is a challenge in translating the prioritized aspects into a designed project/strategy/concept/process.

The student's projects are usually different in their content and perspective, and therefore it can be difficult applying a general formula. The proposed response to the teaching challenge is a workshop that through exercises that utilizes the students own mapping material provide awareness of the roles and hierarchies of the different researched elements. In that way, an extended articulation and discussion of the problem definition could establish a new overall reflection upon what they principally are doing. Theories from construction of argumentation, known from any kind of academic thinking and in written, academic papers, is utilized in order to establish this meta-awareness of the principal parts of the project, and how they are utilized in development of a creative (and intuitive) based project.

TEACHING THEORY/METHOD

The pedagogical outset for this particular teaching activity is based on Donald A. Schön's ideas of the reflective practitioner and reflection-in-action[2]. The goal of the workshop is aligned with Schön's idea of the reflective practitioner, as the main focus is to get the students to reflect on their initial research results as they reconsider how to use their material in the design proposal.

Donald Schön think of the design professions; architecture, urban planning and urban design as exemplary models for how reflective *conversations around a situation and its materials* is practiced[3]. In a learning situation these conversations often take place between the student and the supervisor, in a master-apprentice like model for knowledge transfer, where discussion around design ideas take place. Supervision provides a language to talk about the specific project and its design, as well as about the design processes in general, and it thereby invites to reflection on these issues, so the students acquire a meta-language about their own actions.[4] The type of conversation and negotiation that takes place about a given project in supervision, is also what the architecture education strives to internalize in the student as professional competence to further and evaluate their own work, as well as it is a communicative competence which is necessary each time a project is presented to and discussed with co-workers or clients in a professional setting on the job market. Schön highlights that reflection-in-action is a valuable professional competence, and he argues that it should be valued in the education system.

The design of the teaching activity is furthermore informed by the constructivist understanding of learning, where the learner is in focus, and that the learner's new knowledge takes its departure in the learners existing knowledge and experiences.[5] Another guiding idea behind the design of the teaching activity are the four dimensions of Kolb´s Experiential Learning: experience, concept, reflection and action[6]. Kolb argues that new insights, competences or views are developed through confrontation of these four types of activities. There are two dimensions – or two main confrontations – in the learning process: The first confrontation is between Experience, where the student is involved and engaged in the active experimentation and Concept, which refer to the construction of abstract concepts in order to integrate observations and experiences in logical structures. The other main confrontation is between Action and Observation. Through engagement in the learning activity, the students must be

active: use theory, make decisions or solve problems, while at the same time they must Observe and reflect on the task in front of them from multiple perspectives.[7]
Constructivst learning theory, to which Experiential Learning belongs, focuses on the interactions between the student and the content, while the teacher´s responsibility is to facilitate the learning process. That means that the students must be engaged actively in the learning process, so that the student, either alone or in groups, construct their understanding of the material though their active participation.[8]

LEARNING DESIGN

Our proposed response to the teaching challenge, will described below through Hiim and Hippes Didactical Relationship Model (see Figure 1).[9]
The model is a planning tool for teaching activities and its six components represents crucial aspects of the teaching situation and the model considers these aspects to be interconnected. The model contains both the content of the teaching as well as the contexts for teaching into consideration, so it can provide a multifaceted description of the different factors in play, in the learning situation.

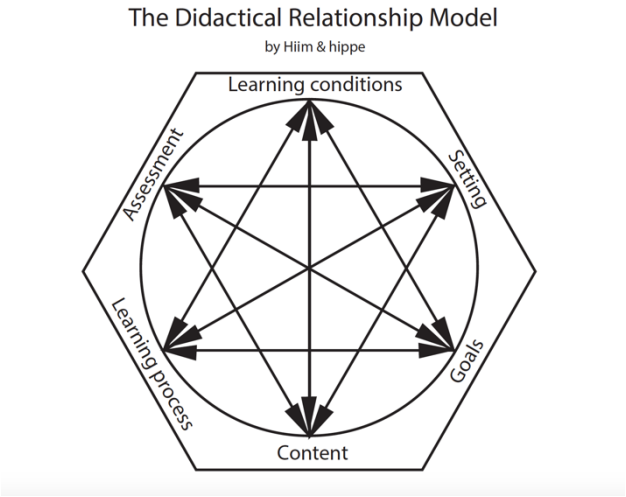

Figure 1. Hilde and Hiim (2017): The dicactical relationshop model (Author´s translation)

Content

The experiment uses Toulmin´s model for construction of an argument as a point of departure for the workshop. The simple version of Toulmin's model is used as a tool to establish meta-awareness of the principal parts of the project, and how they are utilized in development of a creative project. It tests how a known student exercise establishing focus in a traditional academic assignment, as presented in "How to write at good paper"[10]. works when the project delas with creative material and is part of a creative process. The challenges in going from analysis to synthesis is not a unique problem for architecture students, which is why it is relevant to get inspired of how other professions or studies use different tools or didactical exercises to help the student.
The experiment assumes that the use of theories from construction of argumentation (the simple version of Toulmin's argumentation model) might be useful in establishing this meta-awareness of the principal parts of the project, and how they are utilized in development of a creative project.

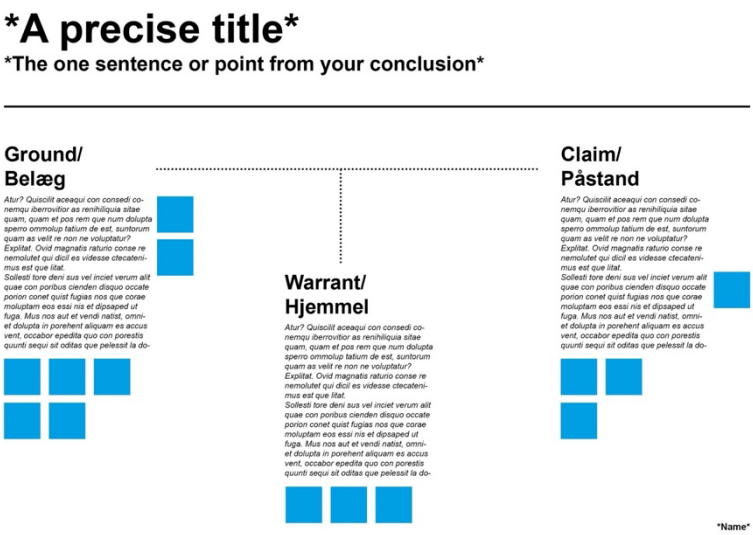

Figure 2. A template with the simplified Toulmin-model that was handed out.

Learning conditions

The students were candidate students (7th, 8th and 9th semester students) at Studio 1A (Urban Design and Landscape Architecture) at the Aarhus School of Architecture. To some, it was their first encounter in working with large scale projects.

The assignment was an embedded part of the overall semester assignment. It was conducted halfway in the semester and within the semester assignment, where the students had finished the majority of their analysis and mapping phase, and where they were developing a main concept for their project. The workshop was introduced at a point in the semester, where the majority of the analytical phase or mapping was finished, and where the students were met with a series of practical and technical constraints, they needed to embed within their project. In that regard, the argumentation workshop was quite different to the other inputs, since its purpose was to establish focus within the project, to prioritize and reduce, where the other workshops and inputs added new layers to the project, and expanded its complexity.

Setting

The teaching project was intended to take place at the studio, so it would be easy with conversations. Due to Covid-19, the teaching project's first part was organized as online sessions, and the latter part took place in the studios.

The supervisors were their regular supervisor (RCB, Aarhus School of Architecture) in collaboration with an external (LMBJ, Aalborg University)

Goals

The pedagogical goal of the workshop format is to engage the students in reflections on their own practice, and their own learning processes. The intentions are primarily to help the student to work more autonomous with his/her's various parts of his/her's project, by helping to establish an overview of the components. The exercise also helps the students to prioritize and reformulate the projects, so in that regard, there is an extra benefit from the exercise in qualifying the project. Especially the combination of writing a claim (the project's main point or conclusion) and organizing the material into warrant, ground and claim brings new understandings of the materials (analysis, mappings etc.), their hierarchy and their relation to each other and to the project's main claim.

The workshop gives room for reflection of own practice, and peer-to-peer learning processes, and provide a language to use in these processes. ” Language” is here both understood as verbal language: the simple key concepts found in argumentation theory, as well as visual language (architect-relevant); the diagrammatical/visual abstracts presented in visual form on the mini-posters/work sheets.

Learning process

The workshop consisted of a sequence of introduction and instruction, small exercises to make the students familiar with the terminology and method and finally work on the students' projects which was presented on day two. The aim of the sequences to equip the students to get to work on their own material as quickly as possible, so they would be active engaged in reviewing and reflecting on their own practice, in accordance with the ideals of constructivist learning theory. The introduction to Toulmin´s model for how to construct an argument was kept short and simple, and a template for organizing key points and material from the students' projects was distributed, to facilitate the analysis process in an efficient way. At the following hand-ins and mid-crits, the students were asked to (re-)present their argument, so the template and its content developed throughout the creative process, and thereby became a tool to focus and refine the project.

WORKSHOP DAY 1:	
09:00-09:45	Introduction to course and lecture
10:00-10:45	Excercise: ReDane[11]
10:45-11:00	Introduction to assignment
13:00-16:00	Individual supervision
WORKSHOP DAY 2:	
13:00-15:00	Individual plenary presentations (templates)
15:00-16:00	Collective discussion and evaluation on the exercise

Figure 3. Teaching design, schedule for workshop: variations between input and hands-on activites

Assessment

The output of the workshop was assessed through presentation and plenary discussions.

RESULTS AND EVALUATION

The teaching project had a positive impact because the students had an organized opportunity to work concentrated with the main focus of their project. The argumentation model (the template) gave them a tool or framework, where they could understand and organize the different elements of their projects, and establish hierarchy in their project material.

The teaching project was effectful in itself, but in the following part of the students’ processes, the teaching project’s newly established focus was helpful in order to prioritize the student’s work, and the project’s material.

The students gained different output from the exercise. The majority followed the initial setup of the exercise, where most gained the expected output. Since the format was open to use a variety of different materials, some outputs were different due to the differing input. These projects were still helping the students. Either by understanding and strengthening the overall narrative, or to understand the project’s elements in a new relation, due to the disrupting effect of the exercise. In the following, a few examples are given:

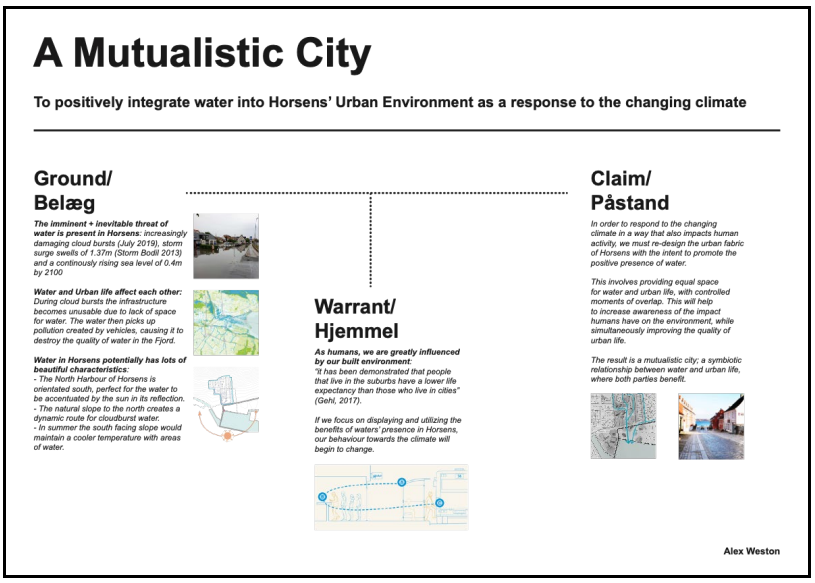

Figure 4. The student followed argumentation model to categorize different types of material from the mapping- and analytical phase. Illustration by Alex Weston.

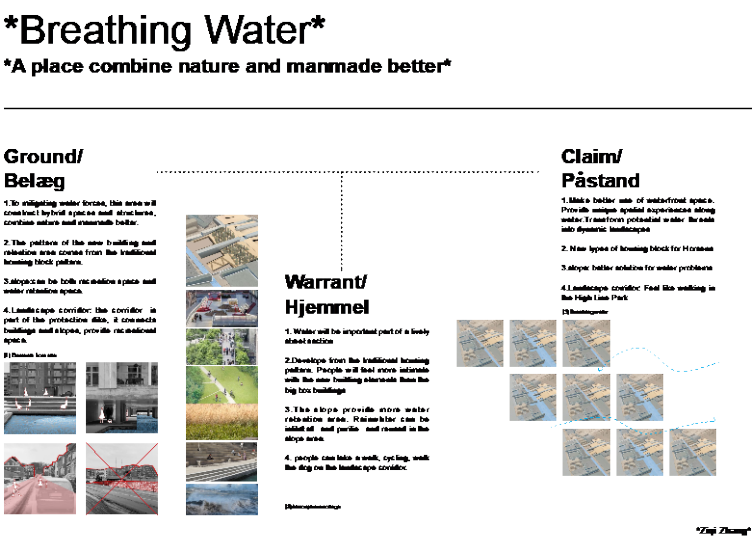

Figure 5. The teaching design and template was open towards using different graphic material in the template. Mappings, photographs, diagrams etc. from the design/development process could be used. Illustration by Ziqi Zhang.

Figure 6. A few projects worked more loosely with the categories, but the template created a framework for formulation of a strong narrative about the ideas behind the project. Illustration by Kristiane Lia Lerstang.

Evaluation

After the final exam and presentation/critique, the exercise was evaluated together with the entire semester, and the teaching projects in specifics. The students expressed that:

- *"It very much helped to connect some analyses to my applied design approach, strengthening the reasoning for doing what I was doing"*
- *"It encouraged me to step back from the project at times, and see this connected timeline running from the early mappings, through the design development and then finishing at the more detailed design work."*
- *"It created a clear division between what was 'objective' observations and what was my own agendas."*
- *"It helped to map which arguments one needed, and which ones that needed to be strengthened in order to move forward towards a strong project."*

Quotes from the students end-semester evaluation.

The students were very positive with the teaching projects content and its form. They felt they obtained a useful tool, and that the timing was helpful.

CONCLUSION

In an overall perspective, it seems that applying the argumentation model and exercise to a design process can help the student to articulate a direction and an argumentation for their projects.

A major part of the exercise's relevance lies within the challenge of moving from the analytical and investigating part to synthesizing, creative and innovative part. In this specific and challenging part or sequence of a design process, the student has the possibility to find and develop their own method, process, expression etc. From a didactic perspective, it is interesting to try and operationalize this otherwise subjective part of process with an extension of the analytical phase through the argumentations model, because it is a phase that allow individual and subjective freedom as a part of the creative process.

For many students, this will be a great help in order to articulate their intentions and the arguments contained in their assignment. At the same time, the exercise might be a challenge for those students who are more artistic and intuitive in their creative process.

One of the exercise's overall aims was to help the students in understanding and rearranging the components of their own material, in order to establish overview, focus and a hierarchy in their material in order to prioritize their work effort and to sharpen their overall concepts. In terms of the

rearrangement and understanding of which parts of the analysis is most important, the exercise is well functioning. In order to establish a hierarchy (and focus), it can be an advantage to be in dialogue with a supervisor if it the first time, one does the exercise, because the output of the argumentation model is directly dependent upon the input.

Working with the simplified variant of Toulmin's argumentation model was an advantage. Pairing the model and material from a creative process was complex enough in itself, and the extended version would assumably only apply an unnecessary layer of complexity to the exercise. The simple model allows a bit more open interpretations of the model's 'ground' and especially 'warrant'. This is an advantage, when we encouraged the students to use their graphic material and their drawings as elements to put into the model. It provides room for interpretation, which can be quite constructive, since the exercise is not about making a correctly performed academic exercise, but rather to establish a way to synthesize thinking and matter within your own project development and creative process.

The learning design has been made in a way, so it is both disruptive and constructive. An exchange between input and activity (e.g. lecture and small exercise, conversation etc.) establishes a constructive iterative process, where the inputs immediately are used and related to the content of the student's own project. This step-by-step or controlled iterative process, is valuable for the exercise's setup, since working directly with argumentation theory is a new territory for most students of architecture as well as it creates the type of confrontations between Experience/Concept and Action/Observation as where learning happens according to Kolb. The fact that the students were asked to define the main claim of their project mid semester, creates a disruption in the students' process, in the sense that they are forced to apply a new terminology and think ahead in another format than they were used to. This disruption made discussions about the design process possible in the peer group, since a vocabulary for reflection was established.

NOTES

[1] Stephen Edelston Toulmin, *The Uses of Argument*, Updated ed. (Cambridge: Cambridge University Press, 2003).
[2] Donald A. Schön, *The Reflective Practitioner : How Professionals Think in Action*, New ed. (Aldershot: Arena, 1983).
[3] Donald A. Schön, 73.
[4] Donald A. Schön, 74, 93.
[5] David A. Kolb, ”Erfaringslæring – processen og det strukturelle grundlag”, in *49 tekster om læring*, edited by Knud Illeris, 283-298 (Frederiksberg: Narayana Press, 2012), 287.
[6] Kolb, 291.
[7] David A. Kolb, 290.
[8] Jens Dohlin, ‘Undervisning for læring’, in *Universitetspædagogik*, ed. Lotte m. fl. Rienecker, 1. udgave (Frederiksberg: Samfundslitteratur, 2013), 65–92.
[9] 30-01-2023 11:46:00
[10] Lotte Rienecker, Peter Stray Jørgensen, and Signe m. fl. Skov, *The Good Paper - International Edition : A Handbook for Writing Papers in Higher Education*, ed. Henrik Schjerning, 1. edition (Frederiksberg: Samfundslitteratur, 2018), 367.
[11] *ReDane*, 2013, https://vimeo.com/82118155.

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ARCHITECTURE´S AFTERLIFE: THE MULTI-SECTOR IMPACT OF AN ARCHITECTURAL QUALIFICATION

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INTRODUCTION

Architecture's Afterlife: The multi-sector impact of an architectural qualification is a pan-European study intended to identify the multi-sector impact of an architecture degree and the extent to which skills taught to architecture students are needed or appreciated in other sectors. Awarded in 2019 by the European Union's Erasmus+ program, the study seeks an answer for why on average, 40% of European architecture graduates choose to work in the creative and cultural professions other than architecture. The ACE's sector study 2020[1] shows how the construction market is not in recession and that the architectural market in Europe continues to increase, rising by 4 percent since the 2018 survey, therefore the choice of an important ratio of architectural graduates to leave the architectural field to work in other sector cannot be the consequence of lack of professional opportunities, but has to be explained deepening the reasons and the features of the phenomenon. At first it's necessary to clarify what do we mean exactly by "leaving architecture", as hybrid professional situations are common but also the profession of the architect seems to have nowadays a broader meaning, not reducible only to the EU classification's well recognized profession of the Building Architect[2]. It's then possible to analyze the competences characterizing architectural graduates to identify the transferrable ones which might be considered as strategical for others professional sectors. Mapping the skills and competencies provided by the AE through the Architecture's Afterlife online survey,[3] it appears clearly that the architecture degrees are considered as methodological trainings in which the working method acquired is even more important that the hard and soft skills developed. This method is related to the design thinking approach and therefore is a cross boundaries tool highlighting the multiple professional profiles in Architecture or maybe the multiple "Architectures" in our changing society in which architects have been often considered as avant-garde leaders. In this sense a new type of educational curricula, more flexible and personalized, can better match this multiplicity of professional trajectories both in the architectural field and in other sectors.

LEAVING ARCHITECTURE: WHAT DOES THAT MEANS?

For many graduates from architectural education, leaving the construction industry offers an opportunity to apply architectural training in new and resourceful ways, both to question the conventional notion of practice, and to find new careers and new sectors where architectural expertise is welcomed and valued.

Questioning the conventional notion of practice Waclaw Celadyn[4] explain how rapid developments in technology are changing the character of many professions, including architecture. The main drivers of change are digital tools, the pervasive sustainability paradigm and the intensified active participation of stakeholders in the design process. These specialization leads to new ways of practicing architecture, somehow more technical, not directly related to the architectural design, but still related with the construction sector in a broad sense. This is a first possible meaning of "leaving architecture".

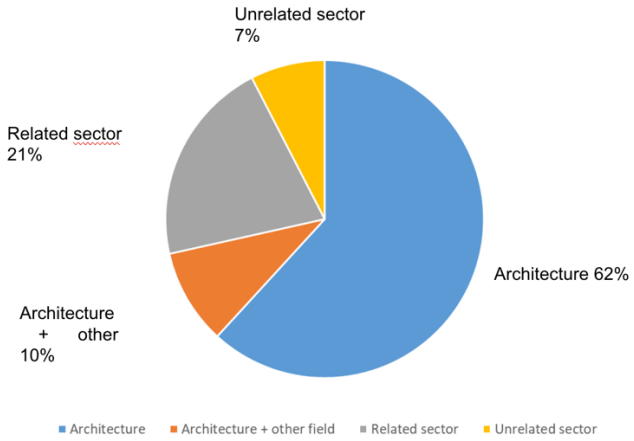

Figure 1. Field of occupation of the architectural graduates

Through the survey, we realized another way to, partially, leave architecture when architectural practice is combined with other professional activities in a significant number of cases, 10%. This is sometimes for economic reasons -difficulties in making ends meet-, but often also because of the interest of architects in other sectors such as editorial activities, political activities, exhibitions activities, and cultural activities in general. Is this because their multidisciplinary education opens their mind to other fields but with a characteristic approach? In some cases -as is shown in the depth-interviews- cultural activities, political actions, or education become the prevalent activities of architecture graduates who, very often, are also chartered architects.

At the same time, there are architects working in other sectors, far from any broad conception of architecture, who still identify themselves as architects because they feel qualified for this, and even more because the title provides a clear and respectful social identity and because they still use many of the competences they learned through architectural education. In the in-depth interviews photographers, public administrators, curators, editors, managers and entrepreneurs are still claiming for a mindset, a certain method that characterize their professional approach and which is directly connected with their architectural education.

NOT ONLY BUILDING ARCHITECTS

Trained to synthesize complexity, architects can prove to be fundamental players in designing solutions to systemic crises. The current state of emergency has prompted new discussions on the fluid boundaries of our discipline – its autonomy vis-à-vis its trans-disciplinarity – often favoring a broad understanding of the architect's role "*as integrator, professional generalist, and practical idealist"* as Rachel Armstrong[5] has recently put it. Subject to discussion since antiquities, a new definition of the architect's expertise is desperately needed.

Thus, the definition of the Title of architect is an ongoing debate both at national and European level. Attempting to define what can be called an architect, some authors review the architectural profession from a historical evolutionary point of view[6], while others examine the historical definitions of

architecture.[7] Alongside them are others who reflect on the reconciliation between traditional values of craftsmanship and contemporary technological advances, as an alternative approach to the egocentric modernist figure of the "Artist Architect" that has dominated ways of building in recent times[8] and establishes the continuing dialogue between the leading architect or conductor and the collaborating architect or team member who exercises no leadership and explores the problematic nature of the professional identity of architects that is constituted in terms of the primacy of design aesthetics, in contexts where practice denies this identification.[9]

In the European professional classification frame the Architect is nowadays conceived only as a "building architect"[10] which means that is in charge of the conception of the building (both artistically and technically) and therefore he signs the architectural design project and he/she is responsible for the economical and physical effect of the building itself. But as the buildings and their aggregations are becoming more and more complex new roles are strategical nowadays, not "signing the project" but being part of the whole process: we can thing about various specialization such as acoustic architect, structural architect, architect responsible for the economical budget or for the governance, site work directors…most of these roles might be played by people not graduated in architecture (engineers, economist, technician..) but graduates in architecture can play these roles in more effective ways as they are aware of the whole conceptual and building process.

On the other hand, many licensed architects are not building and for them "architecture is reconceived as a "constellation" a field of vectors reaching beyond building into the culture life"[11]. Those architects

"by not focusing on buildings, they realized they were better able to serve the public good, by working with local authorities, charities and working with local authorities, charities and community groups, to help them achieve their varied aims"[12].

SKILLS VS METHOD: ARCHITECTURAL EDUCATION AS A METHODOLOGICAL TRAINING

From the starting of the Bologna process qualification in architecture[13] are evaluated through the so-called Dublin descriptors[14], expressing the learning outcomes of each educational level as a list of skills and competences linked to the professional outcomes of the education's curricula.

In this frame, the question of how easy it is to change career paths and sectors comes down to how transposable an individual's skills - and not just their qualifications - really are. The answer lies in another dimension to the study: skills mapping. It stands to reason that if architects are leaving architecture in order to become professionals in other sectors, it's because they are proving to be desirable hires for employers. The study seeks to define which of the skills that architects learn in school are most appealing to other sectors, since this will indicate not only the skills shortages in other sectors, but also the most valuable dimensions of architectural education.

Analyzing the results of the Architecture's Afterlife's it's somehow surprising to observe that most of the respondents cite the ability of developing a broaden vision and of being critical as one of the most relevant competences acquired during architectural education for their present job, unrespectful to the sector in which they are currently occupied.

While most of the recent articles on competencies focus on the construction or building design aspects of the architectural profession,[15] some of them specifically dealing with current and future critical skills in construction industry,[16] outline an outstanding level of excellence in the use of digital technologies, the in-depth interviews conducted in the frame of the research seem to identified the outcomes of architectural education more as a method, a cross-boundaries approach than a technical, hard skills profile. Ranging from the vice-director of environmental association explaining how " being an architect it's something that you can bring in, in the work, in the challenge that you have, it's an approach", to the major claiming that "the greatest benefit I got during my architectural studies is

an interdisciplinary approach, being open to all other experts and expertise and knowing how to learn from them and how to interconnect them", ending with the practitioner architect declaring the "an Architect is a very well educated intellectual, a public intellectual who always tries to project for public good. It is a person who is very sensible towards the environment, towards people and who has ethically high standards and high moral ground", all architectural graduates agree on the importance of architectural education as a methodological training.

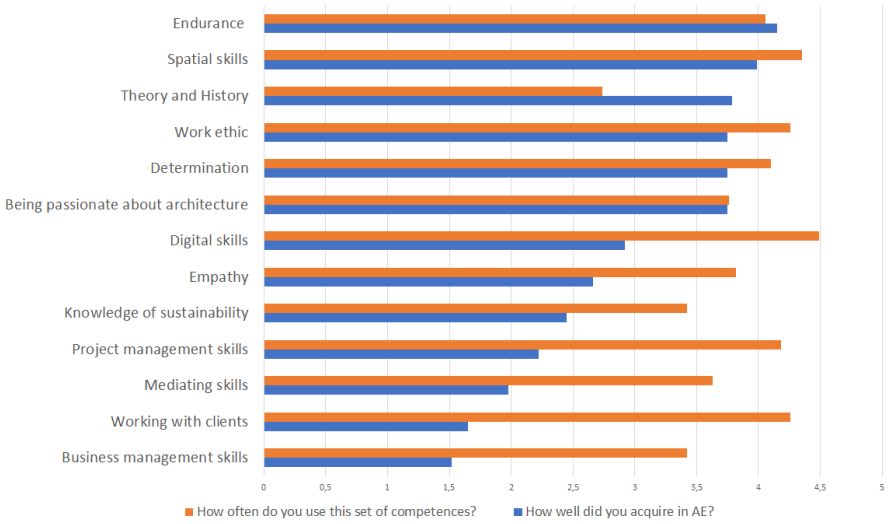

Figure 2. Competences (participants working only in architecture):
How well did you acquire in AE? vs How often do you use this set of competences?

ARCHITECTURE VS ARCHITECTURES

Are graduates in architecture leaving Architecture or are they broadening the field or Architecture?
The online survey which involved more than 2500 responses from all around Europe, indicates that only 62% of the graduates in architecture are working exclusively as architects and 10% are working as architects only as a part of their professional life, but at the same time also working in other fields, related or not to architecture.
This result has led us to reflect in two different directions. On the one hand it led us to consider the occupations of architecture graduates in other sectors as a way to broaden the disciplinary boundaries of architecture, on the other hand it emerged the need not to consider the profession of the architect as homogeneous, but to investigate the different ways of being an architect.
Both directions of reflection were investigated through the in depth interviews which constituted the second step of the research.
The interviews with architects who, in addition to being architects, also carry out another occupation not for economic necessity, but for other reasons such as mainly personal interest, or a sense of civil and social responsibility, has highlighted how their "second" occupation is configured as an extension of their being architects. The most significant examples concern architects who also hold political roles or in public administration who have transposed their technical knowledge of the city and their ability to see and manage complex processes in the governance of the territory and its transformations. Shelley Penn explains it well in her "Personal-Private, Professional-Political",[17] telling how in her professional life she alternated the activity in professional practice and the commitment in the Australian public administrations where she felt to have "the most impact as an architect" focusing also, but not only, on advocacy for good design. In this context, it is therefore

clear how those architects have extended the field of architecture, exporting their own themes and methodologies to other contexts.

However, the architects interviewed, who carry out their professional activity exclusively as building architects, highlighted how their professional sector is extremely diverse. The differences mainly consist in the dimension of the professional reality in which they operate, but also in the target that the different practices have and in the market sector to which they aspire. From the point of view of the needed skills, the interviews reveal how radically different it is to work in small practices, in which each component has to play different roles (from the project, to the research of materials, to relations with customers and administrations), or work in large international firms in which architects are often asked to specialize heavily in the technical, commercial or relational fields. The different natures and dimensions of professional realities also correspond to different market sectors (interior design, public buildings, private housing…) and different purposes (from the entrepreneurial reality dedicated to pure profit, to the realities of social activism). Therefore, a panorama of Architectures emerges from the research rather than an expanded definition of the semantic field of the term Architecture.

ARCHITECTS AS AVANT GARDE LEADERS IN SOCIAL CHANGE

Practicing architects and students of architecture are eager for new paths forward, looking beyond the arbitrary limits of the profession to address systemic crises such as global warming, human displacement, and pandemics.

The strong social responsibility and the production of values connected to architectural education was not taken into account by the Architecture' Afterlife survey, but the subject of codification, inherited values and (re)produced value systems comes to light across the interviewees answers to questions regarding possible improvement of architectural education and the way it can form a person, along with the importance of aiming for a social impact, and making a change via latter architectural practice.

Several questions such as what drives architects to do their work, how to find the right balance between the need for creativity and self-expression and granting client's wishes, and how are values systems reproduced in architectural education were discussed with the interviewees highlighting how, despite some mismatches between the graduates expectations and the professional context, architects "learn to serve". The first hypothesis was that the feeling of social responsibility was somehow related to the acquisition of the license, at least in the countries where this is required to practice as an architect, but the totality of the architects interviewed claimed to get this feeling of social responsibility from the whole architectural education, far before obtaining the license.

Besides, respondents showed that the architect has always been interested in the social and cultural dimensions while creating architecture for people to last, with the help of building science and technology. There seemed to be a clear conscience the way the architect thinks and practices in making a building and a piece of architecture, dealing with cultural poetics and a whole range of social and technical issues of which the physics of the environment is but one dimension[18].

Several studies on the capacity of architects has for contributing to the public good describe a contemporary architectural movement that incorporates public interest design and which has leveraged the built environment as a tool to alleviate social, political, and environmental inequities. By working alongside the public through a community-engaged design process, architects can assist in dethroning systemic injustices that extend beyond the boundaries of the property line. Architecture is not only a product, but also a collective process that instills the tools, awareness, and imagination for communities to self-organize and facilitate profound change[19] both in terms of social engagement and in terms of adaptation to environmental changes.[20]

CONCLUSION: TOWARDS NEW CURRICULA. A PROPOSAL FOR "A LA CARTE EDUCATION"

Is it advisable to design new ways of surfing through existing curricula in Architectural Education, not only in the national frame but at a European level, to produce new kinds of Architects better corresponding to a broadened meaning of the Architect's role in a contemporary context?

Through the results of the online survey, deepen in the interviews, the research revealed that there are multiple profiles of architects, but also that architectural curricula successfully lead to diversified professional paths.

The rate of appreciation for their studies is very high among architecture graduates: 76% say they would choose the same course of study again and 60% say that, compared to their current job, the degree in architecture has provided them with training ranked from good to very good.

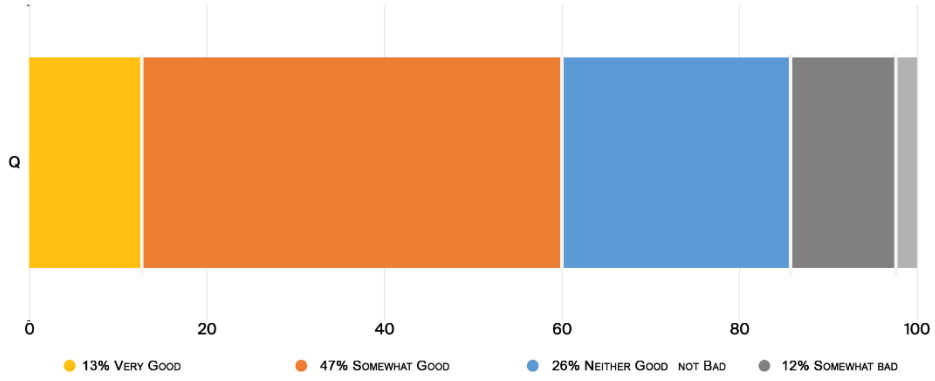

Figure 3. Satisfaction (participants working in all sectors):
Did your architecture studies prepare you well for your professional life?

Despite this, a cross-analysis between the survey data describing the skills most used in the profession, and the skills acquired during studies, highlights numerous mismatches. Considering all graduates, regardless of their current work situation, the area in which there is the greatest gap between what has been learned and what is required is the field of project and business management skills, followed by the skills concerning the ability to cooperate (from the team working to mediation ability with clients and stakeholders), with a mismatch rate of 1.87 and 1.68 respectively on a scale of 1 to 5.

If the discrepancies in these two areas are detected in a homogeneous way in all the different professional areas in which graduates in architecture are involved, the in-depth interviews have instead highlighted other mismatches, even more significant, strongly differentiated according to the professional trajectories undertaken. As an example, the architects who work in large international firms have mentioned strong shortcomings in the preparation with respect to the economic and operational management of the building process, the architects partners in small practices have instead highlighted the lack of entrepreneurial skills and digital skills of the BIM world, while those who work outside the architecture's related sectors finally pointed out the deficiencies in communication and presentation skills. The results of the study therefore suggest redesigning the architectural education in the sense of greater flexibility that allows graduates to plan the acquisition of different skills according to the professional trajectory that each architecture student forecasts for himself. Multiplying types of architectural programs would be excessively expensive, but also still too rigid and perhaps not sufficient to intercept the many facets of the field of architecture which, as Michael Jenson says,[21] "is transforming into a more flexible and fluid interdisciplinary version of its traditional self in order to rise to challenges of this new international terrain". The proposal that therefore

emerges from the research is to design "à la carte" curricula in architecture in which students can select numerous courses from disciplinary fields that might be even very far from those of architecture. In this sense, students would have the opportunity to co-design their own training, thus also implementing self-directed study experiences, a pedagogical modality increasingly at the center of the debate on education.

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ENGAGING WITH A DIVERSE CLASS: TEACHING FOR MANY PERSPECTIVES

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INTRODUCTION

For most of us navigating a scholastic career, university teaching can be challenging. As university students struggle to find their feet in an intense learning environment, faculty struggle to find the correct teaching style to transform information into knowledge and develop critical thinking skills.[1] Increasing the challenge, although this is starting to change, is that few professors are taught to teach. Because we came through university classes, it is often assumed that we understand, in turn, how to construct our own classes effectively.[2] Most of us will admit, usually in private, that this is neither true nor effective.[3] Yet, clearly, "the academic's approach to teaching will influence effective students approaches to learning."[4]

While thinking about teaching has seen increasing attention in recent years,[5] relatively little of that attention focusses upon university level teaching. Of that, much focuses upon either teaching those in Education programs[6] or teaching students with learning challenges (universal design learning).[7] While there are thoughtful works on experiential learning as part of post-secondary pedagogy[8] a gap we have identified in university pedagogy studies, and one we have begun to address, is understanding how to teach students with a wide range of disciplinary backgrounds who are required to participate in one of our courses, which is likely outside their regular disciplinary focus. An additional layer of complexity is the personal and social/economic diversities students carry into their classrooms. Finally, outside the classroom itself, faculty may find implementing experiential or other innovative learning into curricula faces challenges from their own institutional policies which challenge the legitimacy of such teaching.[9]

In this circumstance, engaging students and encouraging their respect for their peers from other disciplines requires careful thought and planning. While we can borrow ideas from pedagogical discussions on teaching in other educational settings[10] we have learned much through "on the job training". In particular, in our university teaching, we have learned a new humility: it is essential to learn from our own and others' successes and failures.

The general dearth of literature on this type of teaching challenge does not permit broad learning. What early and exploratory work that does exist offers some promising ideas and helpful suggestions.[11] Derek Cheung et al. (2020), support our assertion that teaching students with diverse backgrounds does present challenges, but note that allowing students to come together on shared activities can facilitate learning in these classes.[12] Min Yang (2009) supports exploring interdisciplinarity for its pedagogical implications as ways to heighten student engagement and learning in multidisciplinary classrooms.[13] Humberto Blanco-Canqui et al. (2018) indicate that a

successful technique using field activities (in appropriate courses) provides a specific focus of bringing students together to complete specific tasks. They also note, however, a dearth of actual studies on activities and impacts.[14]

As part of what we hope is an emerging body of literature on activities and application in university level classes, we offer ideas gleaned from our collective 50+ years of teaching often required courses that mix multiple disciplinary majors into courses that offer material outside of individual disciplines, and likely personal comfort zones, for learning.

Some Background

Theresa teaches in a professional Planning program in a northern Canadian university. Her practice focusses upon community engagement largely around social concerns, including with Indigenous communities and her classes include students studying to be planners (usually from diverse backgrounds and professions) as well as other future professional students in majors such as social work, nursing and forestry. Annie is a professor in Environmental and Sustainability Studies at that same university, but teaches engagement to seven different majors, most with natural resources management foci (i.e. forestry, conservation science, wildlife management). Her background comes out of government, included Indigenous governments/communities. These different backgrounds create different approaches in our university teaching, but we share a need and interest in functionally engaging the vast diversity of majors who find themselves in our courses, by choice or requirement. Together, we have a successful history of shared interests, shared research, shared advocacy, and shared pedagogical interests that enables us to sustain a collegial and willing relationship to question and a readiness to rethink our own work and place in the teaching learning equation.[15]

Lessons from the Field

In our decades of teaching, we have developed a few “touchstones” of thoughtful teaching practices when faced with a diverse-discipline class. Before offering these, we would like to be clear that we have learned the utility of these approaches the usual way professors learn how to teach: the hard and brutal path of trial and error in the face of “must solve now” challenges. In that spirit, we share a few of our hard-core learning opportunities.

Annie

I created the first Environmental & Professional Ethics taught at a new university in 1993 and have taught it pretty much ever since. Even at the beginning, I had students from majors ranging from the BA in Environmental Studies to Planning to the BS in Forestry taking the course as a requirement. When it came to professional ethics, I taught about ethics for Forestry professionals and for Planning professionals, both of which are accredited professions with clear Ethics Codes. After a few years of forcing students to listen to these singular and irrelevant (for the majority of them) perspectives, I realized that I was missing (boring) the other majors and, worse, by looking at the standards of only two professions, not even the forestry and planning students were grasping the bigger picture of being a professional in a broad and complex ecosystem of professionalism. So, I changed my approach. Now, these discussions focus on the ethics all people working in a public capacity in natural resources and environmental positions should consider and how to address conflicts. It lets students gain a bigger picture, as well as a better understanding of how they fit in. Most important, they gain respect for each other, as professionals who might find themselves working together, whether they are becoming an accredited professional or not. I always point out that university professors are not really professionals in the sense of being accredited (or much of anything, really). This makes them rethink quite a bit.

Theresa

My Mediation, Negotiation and Public Participation and Course, first taught in 2014, focuses on the practical skills required for Planners who must engage with members of the public, usually on contentious community issues and within competitive ideas of resource management. However, aspiring professionals in other fields who find they too must engage with members of the public began to register in the class. Like Annie, I had to find ways to make tools for public engagement relevant to other professions. Interestingly, tools that are useful in public engagement also double as useful teaching tools that place all students on a similar footing in the class: novice apprenticeship. Thus, students gain practice with particular community engagement tools as they learn about their use and possible applications by using them for their own assignments. There is an added pedagogical bonus: experiencing a tool live and in person instills a confidence so that when the appropriate opportunity arises, the student, now a practicing professional in their own discipline, is more willing to use the tool. In some cases, the experience of feeling heard and included, and the outcomes the tools can contribute to, can be extremely powerful in their shared experience as students and as a mechanism for improving their own classroom environments. In one instance, using the 25/10 engagement method (https://www.liberatingstructures.com/12-2510-crowd-sourcing/), the students were so delighted with the results they wanted to forward them to the university president for action. Another year, students used a chain of tools to host a conversation between leaders of the two (competitive and non-cooperating) city farmers markets which had split over deeply held personal convictions. Today, the two markets co-exist at either end of a downtown avenue, bookending a downtown revitalization effort that really wanted both markets involved. The downtown revitalization agency, who had supported the students' work, gives credit for the transformation to the students' efforts. Finally, a controversial community issue (a proposed industrial complex in a community setting) engaged an upper year class in designing and delivering a World Café community consultation. The students' work was compared to the community consultation by the proponents and judged superior by many in attendance. Given that the students come from an array of disciplines - the class focus on a shared learning of practical application engaged all the majors equally as class topics and subjects are developed from shared usage that cross disciplinary lines.

Annie

For my public engagement class, I book real clients with real needs (Theresa does as well). This always feels a bit risky, having students run real life engagement projects on their own (with the instructor having approved their proposal and being in the background, coaching). Yet there is something in that responsibility that brings out the best in almost all the students, regardless of whether the project falls within their discipline or not (and it usually does not). Real clients have ranged from the Hospice House to the city government to the university to the local wildlife society and the students have almost always gone above and beyond, leaving much needed results in their wake. While there is always some reluctance to do projects that aren't in their field, the challenge of doing any form of engagement really causes students to think, while building useful bonds with organizations that don't always see the benefits of the university or of students working with them. The shared focus becomes how to do the public engagement, regardless of discipline so the students work from a shared place. There is a place-based advantage to this: as instructors in a smaller community, and with a region deeply committed to the success of the university, the relationships we have built enable us to ensure any projects chosen can actually be accomplished.[16]

Theresa

Choosing to teach in a circle, so that students do not stare at the back of someone's head, has been an integral component of building a classroom climate that supports the risk taking required of the deep learning potential of experiential exercises based in the real world. Every class begins with the circle and an opening round, with the opening round question evolving over the course of the semester. Students report that while uncomfortable at first, they grow to love this space for their voice at the front end of the class. Even though we are a small university and students do bump up against each other, the students say they never get a chance to know each other in a meaningful way. Building a course contract, with a story telling sequence of a time you did not learn, the students collectively craft the principles so that the event in the past of the student is not repeated in this class. Some of the stories shared by students of what silenced them or shut them down are soul searing and students have never had an opportunity to talk about them before. The stories are frequently not unique to one student, and you can see other students nodding affirmatively. In crafting these principles of how to live and learn together, students come to understand how important communication to their work and learning and how to focus on doing it better.

Theresa and Annie

We both use group projects AND give students time within classroom time to work on them. These are very mixed groups, as the courses we use them in often have up to 8 or 9 different majors among the students and while there is some voluntary clumping, as the students are assigned by project interest, they are mixed discipline groups in the end. Thus, they are forced early on to contend with different backgrounds and knowledge. The students are surprisingly good at negotiating these differences within their group and assigning tasks by skillset. While they do have time within the scheduled courses to meet with each other they also learn to be accountable and complete tasks between in class group meetings. At the same time, we subtly encourage managing the meetings and task deadlines to be themselves a learned skill. We have used the projects within very different courses, and the students report the skills they learn negotiating with each other across disciplines to be very valuable, if occasionally frustrating.

This requires hands off unless needed; teachers have to trust in the students' process and let them sort things out for themselves, while being eternally ready to be there if the group goes pear-shaped. At the beginning of the semester, students are resistant to the notion of group projects, and reminders that group work will figure hugely in their futures helps disarm the initial resistance. The in-class time promised for group projects also helps disarm resistance to group work as the students are more ready to take risks and challenge themselves, if the sense of a "safety net" is within reach and any outside of class time is less frustrating to schedule. This is a strong learning space with that additional benefit of the coaching and mentoring made possible by the juxtaposition of students working on their real-life assignment, and the professorial presence in the room.

SOME LESSONS AND CONCLUSIONS

As noted above, our experiences have led us to develop a few key "rules" for effectively teaching mixed-discipline classes.

1. Never be afraid to change things up, even on the fly. If you can be calm and turn a challenging situation into a productive one, the students acquire some knowledge of the steps you can take when everything around you is falling apart.[17]

2. Experiment. Be clear with the students when you are, but experiment. Your confidence to adapt and shape tools and materials to suit the outcomes you are seeking is an object lesson in critically thinking on your feet.

3.Use the real world. Building relationships, supporting the development of partnerships centered on the student experience, creates the shared accountability for a learning experience. Often, the side benefit is community partners often put aside contentious issues in order to ensure students have a positive experience.[18]

4.Teach for everybody, not just the discipline you are comfortable with or who are the majority in the class. There are shared lessons that all students need to learn, and they will learn better when doing so in a mixed class. The overlap between disciplines that brought students into your class are the foundation for a respect for and capacity to cope with interdisciplinarity that will serve them in good stead when they have to work with other professions in the real world of their own professional practice.

5.Develop a practice of paying attention to and "reading the room" at the start and as you proceed. Modelling the skills of responding to your own reading of the class, and how such reading can increase facilitating successful outcomes for their learning, is a strong lesson for students' own comfort with this softer skill.

6. Seek out collegial support. This is not a competition. In fact, one of the impressive outcomes is for collaborating professors developing trusting and supportive relationships with each other that pay off in other challenging circumstances – such as having to rapidly pivot to on-line teaching at the onset of Covid-19 (Thomson and Trigwell 2018).[19]

7.Trust your students. Especially when you are clear with them on the challenges you are working through, they become co-creators and experimenters in the learning process. While sharing power in the classroom is difficult at first, it is more than worth it. When classes are co-authored, everyone learns.

In closing, the adaptation of interactive and engaging learning tools has not only enlivened the learning space for students and proved to be an admirable method for improving learning across and between disciplines, it has also fueled an ongoing and challenging passion for teaching that has spanned over 3 decades. Engaging learners also ensures that professors also remain learners, re-engaged and re-energized by their own teaching as well, constantly challenged and constantly evolving better teaching.

NOTES

[1] Paul Ashwin. “Transforming University Teaching,” Centre for Global Higher Education working paper series, Working paper no. 49 (April 2019). https://www.researchcghe.org/perch/resources/publications/to-publish-wp49.pdf. William Buskist and Jared W. Keeley. “Searching for Universal Principles of Excellence in College and University Teaching.” New Directions for Teaching & Learning 156 (2018): 95-105; Carl E. Wieman. “Expertise in University Teaching & the Implications for Teaching Effectiveness, Evaluation & Training.” Daedalus 148, no. 4 (2019): 47–78.

[2] Buskist and Keeley. *Searching for Universal Principles of Excellence.* Olga A. Dyomina and Irina A. Tepleneva. “Modification of Teaching/Learning Strategies of University Teaching Staff.” Higher Education in Russia 29, no. 7 (2020): 156-167.

[3] We invite our readers to reflect on how they actually learned to teach and some of the costs and opportunities. We were not “taught”, we learned through passive observation of our own professors, by trial and error during working at being a teaching assistant (usually with minimal oversight by the professor), offering the occasional lecture when our professors allowed or, if very fortunate, being hired to take on a class before getting a teaching gig. Annie’s first course on her own had 302 students in it, a challenge of swim or sink. Theresa’s first teaching experiences were as a teaching assistants for the labs associated with 200+ classes, albeit with a professor who encouraged theater in the labs. Most professors have similar experiences in learning to teach not being taught to teach.

[4] Velibor Mladenovici, Marian D., Laurentiu P. Maricuțoiu, Daniel E. Iancu. “Approaches to Teaching in Higher Education: The Perspective of Network Analysis Using the Revised Approaches to Teaching Inventory. Higher Education, 84, no. 2 (2022): 255–277. P. 256.

[5] Carolee Clyne. “Modelling Universal Design for Learning to Faculty as Learners Developing Engaging Educators” (PhD diss., University of Northern British Columbia, 2021).

[6] Seija Karppinen, Veera Kallunki, and Kauko Komulainen. “Interdisciplinary Craft Designing and Invention Pedagogy in Teacher Education: Student Teachers Creating Smart Textiles.” International Journal of Technology and Design Education 29, no. 1 (2017): 57–74.

[7] Clyne. *Modelling Universal Design*.

[8] Kathy Snow, Leslie Wardley. Lorrraine Carter, Pat Maher, “Lived Experiences of Online and Experiential Learning Programs in Four Undergraduate Professional Programs,” in Collected Essays in Teaching and Learning Vol. XII. Pedagogical Innovations: Adapting Practice to Evolving Cultures. (Society for Teaching and Learning, 2019): 79-93. Considerable scholarship on the efficacy of experiential learning in undergraduate graduation exists. See David T. Moore, “Experiential Pedagogies in School,” in Engaged Learning in the Academy. Community Engagement in Higher Education (New York: Palgrave Macmillan, 2013), 153-186. What we find missing is discussion of the challenges in implementing any novel teaching initiatives and teaching in diverse classes (either diverse majors or students of diverse abilities and needs).

[9] Snow et al. *Lived Experiences*. Our institution offers few resources or support for such initiatives. Professors are not credited with the extra workload associated with anything other than the traditional “stand and deliver” teaching styles, and no recognition occurs for those on the tenure track. Even physical resources are lacking: classroom space is set up for lecturing, not engagement, and funding for exercises is often unavailable. This can limit professors willingness to undertake such teaching efforts.

[10] Karppinen et al. *Interdisciplinary Craft Designing*. Lacey notes that “professional education must expose future practitioners to the knowledge, judgement and defining values of their chosen profession.” See: Denise Platfoot Lacey, “Assigning Reflection in Experiential Learning for Professional Formation,” in Diverse Pedagogical Approaches to Experiential Learning, Volume II, ed. Karen Lovett, (Switzerland: Palgrave Macmillan, 2022), 171-180.

[11] Kathy Snow and her three colleagues recorded the experiential pathways for their diverse professional programs and argued these learning practices deepened subsequent professional practice. See: Snow et al. *Lived Experiences*.

[12] Derek Cheung, et al. note that students from all faculties in a diverse classroom can make significant and comparable gains in attainment and self-reported generic skills within a classroom integrating effective teaching methods. Derek Hang-Cheong Cheung, Andy Ka-Leung Ng, Kai-Ming Kiang & Henry Hin-Yan Chan, “Creating a Community of Inquiry in the Science Classroom: An Effective Pedagogy for Teaching Diverse Students?”, Journal of Further and Higher Education 44, no. 1 (2020): 1-13.

[13] Min Yang. “Making Interdisciplinary Subjects Relevant to Students: An Interdisciplinary Approach.” Teaching in Higher Education 14, no. 6 (2009): 597–606.

[14] Humberto Blanco-Canqui, Sabrina J. Ruis, Carol A. Speth, and Donald J. Lee. “Teaching Undergraduate Soil Management to Diverse Majors: Linking Lectures with Field Practicals.” Natural Sciences Education 47 (2018): 1-

7. We can only speculate on the reason for the lack of literature. In part it might be due to a perceived lack of reward for such publications in the tenure and promotion process (the usual driver for publishing). In part it may be due to a lack of journals interested in publishing such studies or reviewers sympathetic to such work. We would encourage readers to think about sharing their experiences, to start building the literature in this area.

[15] We also recognize that individually we would have been unlikely to reflect upon these issues. It has been in our partnership and mutual discussions on our classes (in addition to lecturing in each other's classes) that has led to these shared reflections. We think this might be an important reflection in and of itself as professors begin to reflect on their practice: it's better together. Certainly, a longstanding relationship of trust and mutual respect was a forerunner to the emergence of the collaboration.

[16] There have been other developments coming out of teaching public engagements courses in different ways. In 2021, in response to a critical comment by Annie on the failure to actually engage with the university community, our university President turned around and asked us to develop a workshop for senior university administrators on how to engage equitably and inclusively with the students, staff and faculty they are responsible for and to. This is scheduled to be offered in 2023 and itself will become a publication. Facilitative teaching can take you to some interesting places.

[17] We note that the students learn a great deal about this from watching the professors trying to figure it out on the fly, both about the need to do so and about the fact that even those who teach something can still flounder and need to pinch-hit. Often it is witnessing the struggle and not the pitch perfect delivery that influences the confidence of students to take risks with their own learning.

[18] We feel very strongly about using real needs from the community for our projects, universities and colleges are important resources for the communities they take up space within, we feel a moral obligation to our community to give back to them, even if the larger institution might not.

[19] Kate E. Thomson, and Keith Randal Trigwell. "The Role of Informal Conversations in Developing University Teaching?" Studies in Higher Education 43, no. 9 (2018): 1536-1547. We draw this lesson from our own experience of the collaboration that became known as W(h)iney professors. In the summer leading up to the semester we would be teaching online for the first time, due to the COVID-19 epidemic, five of us came together in regular online meetings, to talk through our goals and hopes, to help each other develop syllabi and effective assignments and engagement techniques and to test out the platform (none of us knew how a PowerPoint would work online). We carried on, with wine (hand delivered by one member) and tee-shirts, into the year, meeting monthly to share successes, failures, and share ideas for doing better next class. We attribute our survival during that first semester to that mutual collaboration, peer-mentoring and mutual commiseration. What we learned from this experience, besides how to pivot to online teaching, was the importance of such collaboration. It certainly felt risky in those early days, to share curricula for review and critique by colleagues. When planning for your own rethinking of your teaching practice, reach out to those who also might be interested in that mutual inter-learning.

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DESIGN STUDIO EDUCATION: WHAT CAN IT BE WHEN IT CAN NO LONGER BE? A REMOTE TEACHING EXPERIENCE AT FAU-UFRJ

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INTRODUCTION

This paper reports a pedagogical experience during the pandemic period at the Department of Architecture Design (DPA) of the Faculty of Architecture and Urbanism (FAU) of Federal University of Rio de Janeiro (UFRJ), seeking to identify contributions from alternative teaching experiences to the design studio discipline.

In response to the pandemic context, DPA chose to offer elective disciplines instead of mandatory ones. By doing so, it allowed professors to propose significant changes in both the discipline contents and its procedures, resulting in a variety of approaches not necessarily aligned with traditional design studio practice consolidated at FAU.

In this regard, we seek to explore epistemological and methodological outcomes of the remote experience, by analyzing the course content, the design methods and outcomes of two design disciplines: Atelier Integrado I (AI 1) and Projeto Arquitetônico IV (PA IV).

The definition of a "traditional design teaching" model, as offered by Ashraf Salama, will serve us as a guiding parameter to build a parallel between the two approaches, highlighting their diverse and complementary contributions to design thinking and education.

Design Studio Culture

The relevance of design as a convergent core of knowledge in Architecture is related to the synthesis`s exercise it aims to achieve. Although we stand by this belief, we are interested in investigating to what extent a predominant design culture is tutored by positivist paradigms, anchored in a historical role of architects as building designers, going against current understanding about contributions of a comprehensive design teaching that explores its cognitive dimension. This perspective involves overcoming the predominance of an instrumentalized approach to design teaching, that focuses not only in delivering architectural solutions, but educating professionals to be able to anticipate and forge new design problems; to analyze, understand and communicate complex socio-spatial contexts; to generate knowledge applicable to different and complementary disciplinary fields.

Design Studio Teaching Practices: epistemological e methodological concerns

Some authors dedicated to study design discipline and its influence in shaping architectural education are focused on elucidating the epistemological dimension of design and how such framework might impact the teaching practices adopted in the studio. Accordingly, we understand design as a way of

knowing and a way of doing; as a field that operates its own dynamics when coping with different disciplinary areas, such as architecture, urbanism, and landscaping.

Richard Foqué[1] emphasizes the concept of design as a way of thinking, which is heuristic, innovative and experimental. Heuristic insofar as it stands as a methodological instrument that intends to raise, discover, or solve a problem; innovative because it presupposes knowledge that is always contextualized, relative to someone, to a place, at a given time; and experimental by the strategy of anticipating possible formal hypotheses, but never absolute ones.

For the Argentine theorist Roberto Fernández[2], design discipline involves knowledge about the past, understanding physical and social transformations over time, but also knowledge about future transformations. In this sense, design is also a way of speculating, of suggesting the new, not necessarily limited by the need of its immediate materialization. The simple replication of standard design solutions, guided by the pragmatism of professional practice, reduces the generation of new knowledge about the discipline. On the other hand, pedagogy and didactics that explores design research and building knowledge by design will deal with the elaboration of new design problems and procedures.

In this regard, we understand didactics in the sense that Melissinopoulos[3] offers us, in which the term encompasses the practical activity of teaching and the theory relevant to learning processes. A look at teaching didactics is concerned, therefore, with aspects referring to what is taught (content), how it is taught (methodology) and what it is taught for (training objectives).

TRADITIONAL DESIGN STUDIO TEACHING

To some extent, it can be said that Architecture School was born to validate design as an intellectual practice, distinguishing the operational competences pertaining the construction activity from the cognitive skills involved in the graphic description of a building's idea. However, although this distinction gave rise to design as a discipline, it also established a long-standing association of design outcomes as architectural solutions.

Tradicional Design Studio: synthesis and structure

The design teaching method, which laid the ground for most architecture's schools comes from the Renaissance-Modernist ideology of simulation/replication. Simulation in the sense of artificially creating in the studio a context supposedly equivalent to the one found in architect's professional practice; and replication by accepting the professional experience of the master/tutor as the ideal framework from which teaching and learning dynamics are shaped, as far as to associate subjects and discipline content with the teacher's personal design approach.

Ashraf Salama[4] offers a non-exhaustive framework that synthesizes the characteristics of what he called traditional design teaching, tributary to the academicist ideology of the profession and the fragmentary didactics of composition skills. This pragmatic endeavor, organized into analytical categories, helps us to reflect on the objectives and scope of design in educating the architect, in addition to indicating parameters from which to qualify and compare the didactics studied here.

Figure 1. Salama`s framework for Traditional Design Studio Practices

Context and application of knowledge

The traditional teaching approach, based on the French and German models, comprises two parallel axes: the acquisition of theoretical knowledge and the application of knowledge in design practice. The prioritized theoretical knowledge, however, is aimed at an instrumentalized understanding of design activity. The creative process is limited to aesthetic-formal elaborations, favoring sensitizing procedures over cognitive ones, where, for example, creativity is needed to relate different types of knowledge.

To successfully associate theory and practice one needs to understand the type of knowledge is being taught. When it comes to traditional design studio, the criticism lies in the election of descriptive and explicit knowledge to the detriment of other types. Explicit insofar as it limits architectural knowledge to a confined set of rules and information which are, therefore, ready to be transmitted; descriptive in the sense that emphasizes the merely representative and figurative dimensions of architecture.

Traditional teaching also tends to oversimplify design problems. Information or concern about social, political and economic dimensions are given little attention as opposed to developing drawing skills, mastering building technology and improving communication strategies.

Design Process and Design Teaching Style

Regarding the didactics applied, the traditional approach places too much emphasis on two aspects of the design process: the initial sketch and the final presentation. This occurs to the detriment of other design phases and learning processes, such as research, critical analysis, generation of hypotheses, group discussion. For instance, investigating and structuring a design opportunity is seen as a minor objective. The course plan usually presents, in advance, a well-defined design problem, indicating the program, terrain, means of representation and format of deliveries. The role of research in design exercises is practically irrelevant or limited to formal and technical concerns.

The hierarchical relationship between teacher and student is also characteristic of the traditional studio. The desk-crit method predominates, as does the show-and-tell dynamics, where the teacher focuses more on solving a specific design problem than trying to apply overall learning outcomes to different circumstances.

FRAMING THE TRADITIONAL DESIGN STUDIO

In order to identify and compare the information related to the design disciplines concerning this paper, we went through Salama's analytical categories, reframing their content into questions regarding the plan course objectives, methods and outcomes, from both pre-pandemic and post-pandemic contexts. By doing so, it was possible to visualize pedagogical limitations and possibilities for an evolving design studio culture at DPA-FAU-UFRJ.

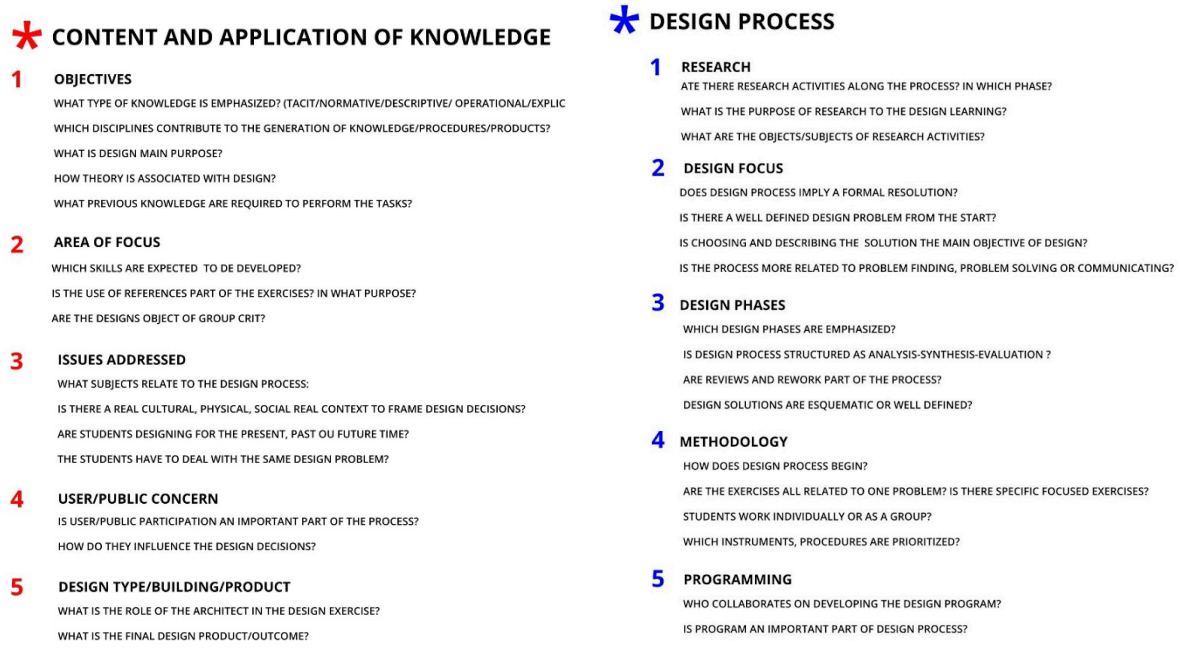

Figure 2. Design Studio Practices - Framing Questions

FAU-UFRJ: Before and after Pandemic

Several curricular reforms helped to build the pedagogical project of the oldest architecture school in Brazil, but its academic roots are still shaping the school`s idea of architecture and of what architects should do. At DPA, the master-student training dynamic still prevails in the studios, as well as course content and methods based on problem solving for types of buildings or urban contexts. Principles of order and form composition still guide the design process, but with a lack of appreciation for the study of precedents, discredited by the long-standing influence of modernist approach to creativity.

In the pandemic context, the DPA opted for a more cautious transition from face-to-face to online modes of education, by offering elective disciplines instead of mandatory ones. As a result, this decision presented an opportunity for teachers to experiment alternative approaches to design studio, with greater freedom in proposing new content, design methods and tools.

The analyzed information of each discipline was used to answer questions relevant to 3 guiding parameters: content and application of knowledge, design methods and teaching style. The results are organized in a sequence of tables shown below, framing both course periods. In the lines that follow, we bring a synthesis of these changes, emphasizing significant accomplishments and limitations of the remote teaching experience.

Atelier Integrado I

The Atelier Integrado (AI) is the second design discipline offered at the fourth semester of the five year undergraduate Architecture and Urbanism program. It presents the beginning of the in-depth training cycle of the program, and it is currently characterized by the integration of contents from

Architectural Design 2, Architectural Theory 1, Landscape Design and Digital Graphics. In the pandemic period, AI classes were offered synchronously and remotely, through the Miro platform. This space, associated with the Microsoft Teams application for audio and video transmissions, became the place for sharing and producing knowledge, simulating face-to-face dynamics throughout the development of design exercises, with student presentations and teachers' verbal feedback.

Content and Application of knowledge

Among the fundamental changes brought by the remote experience was a turn on the very understanding of design objectives. Motivated, among other things, by the disassociation of the design exercise from a real physical and specific context, the proposition focused on problem finding as the starting point of the design process. The initial premises were limited to spatial delimitation of the study area and theoretical reflection concerning the subject: “Inhabiting the open city: possible scenarios in times of social distancing”.

As the initial provocation does not set a unique design problem at front, this will be consequential of how and by which means each group chooses to approach the design task. In this way, each design project was characterized by specific processes and results, as opposed to the previous proposal.

In addition, distancing the initial tasks from the traditional objects of architecture allowed other disciplines to influence the design decisions more directly, leading student's gaze to less figurative aspects about the place, such as symbolic culture, history, and political issues. In other words, interdisciplinarity occurs in a less instrumentalized way.

Likewise, operative, and tacit knowledge play an important role, because the student's technical and cultural backgrounds impact their ability to raise questions and translate them into objectives and procedures tackled by design.

On the other hand, opting for problem finding implies investigations that vary in scope, scale, language and means of expression, making it difficult to level student`s learning by common criteria.

Although the activities are in groups, two factors were detrimental to a less collaborative environment in the remote experience. The first, the very limitation of the digital mediation of interactions. The motivation for exposing ideas is lower and less controlled by the teachers and inequality of internet access between students made some experiments unfeasible. Second, the fact that each group develops its own work, reducing the natural disposition to exchange information without the mediation of the teacher.

Figure 3. AI1 Procedures and Results Illustration

Design Process

The design process is structured in three subsequent and correlated phases: proposing questions; design strategy; and possible scenarios.

Phase 1 explores design as a research instrument by exercising interdisciplinarity assimilating different types of information and translating them by the purposefulness imbedded in design thinking. At this phase, research operates as a critical instrument, informing and revealing, rather than justifying choices already made. When dealing with different information, students expand their communication skills, exploring languages not exclusive to architectural vocabulary.

In modules 2 and 3, the master/student dynamic and the production of information for evaluation purposes, direct design approaches towards schematic formal solutions, despite the disparity between student`s works in terms of scope and degree of resolution. In other words, there is a redirection in the focus given to design knowledge, prioritizing its instrumental, descriptive dimension, and emphasizing communication and presentation skills.

The rhythm and products of modules 2 and 3 do not, however, prevent students from recognizing the contextual nature of the design process and the consequent methodological plurality inherent to design knowledge.

Figure 4. AI1 Content and Application of Knowledge/ Design Process -Comparison

Projeto Arquitetônico IV/ Projeto de Interiores

Projeto Arquitetônico IV (PA 4) and Projeto de Interiores (PIn) are design disciplines offered at the sixth semester of FAU undergraduate program. Before pandemic, both disciplines were already under reformulation.[5] In the pandemic period, classes were also offered remotely, through Miro platform and Google Meet. Remote teaching led to the questioning previous design strategies, such as problem definition around place and program as given in the course plan. Similar to what happened in AI, the restrictions of displacement and face-to-face visits to a chosen place motivated changes in student`s initial approach to design. this was With the pandemic, instead of proposing a place and programmatic demand for the entire studio, given the restrictions of displacement and face-to-face visits of all students to a place, the definition of the place and design problem was opened to students, which was an opportunity to get closer to their realities.

Content and Application of knowledge

The students were given the autonomy to build their own design problem, from the perspective of places familiar to them. Some premises should be followed by all groups, like developing design solutions that could respond questions about tectonics and its meanings and be associated with definitions about “minimal architecture” - small-scale intervention, related to pre-existences and capable of significant transformations. Despite those common requirements, it was noticed that analysis of pre-existences and human activities were more in-depth than usual, leading to design decisions less detached from reality.

Although the main objectives of the discipline remained the same, the pandemic context was used as critical instrument to reflect on social, economic and political awareness when analyzing case studies for operational purposes. Remote teaching also made possible to invite Latin American architects, authors of cases studied, to participate in conversation with the students about design process.

Despite the openness of initial tasks, the emphasis on structural and constructive aspects of the final product tends to liken the results, not only in scale, but in programmatic complexity.

Drawing skills remained fundamental to design development and presentations, but the physical model was abandoned, giving space to electronic ones. Group discussions were also intensified, allowing conversations with the participation of a greater number of students, making the process more collaborative.

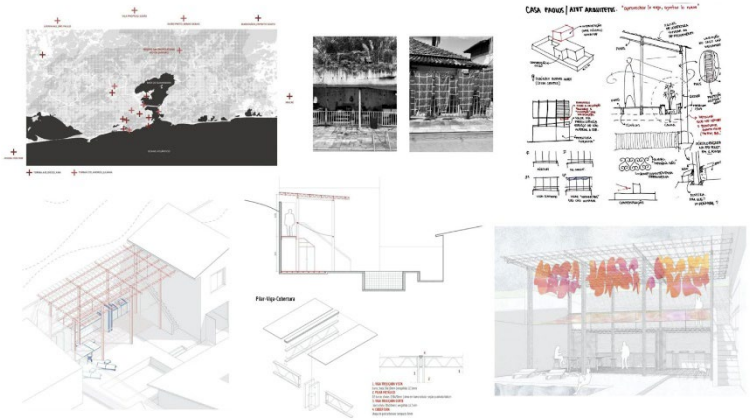

Figure 5. PA4/PIn - Procedures and Results Illustration
(Students-authors: Ana Totti and Arthur Frensch)

Design Process

The design starts with choosing an area and formulating the design problem followed by case studies exercise from a given list. All exercises are related to one design problem formulated by each group. The initial exercises are related to drawing analysis of case studies.

The design process is deeply linked to research. In parallel with the case studies, drawings are developed to recognize the contexts of intervention, in addition to research on social aspects, human activities and ways of life. The research aims to produce knowledge directly and indirectly related to problem solving as so that it can be applied to situations other than those dealt with by the students.

Each design phase is equally valued. The final product is a well-defined architectural solution including formal, spatial and constructive definitions.

In most cases, there is interlocution with users for developing the design program. But although the user's needs and wishes are taken into consideration, it is encouraged to think beyond present demands and about the potentialities of the indetermination and transformation capacity of the architecture.

DESIGN PROCESS

PA 4

IN PERSON

1 RESEARCH ACTIVITIES THROUGHOUT THE WHOLE PROCESS, BEGINNING FROM RECOGNITION AND SURVEY OF THE GIVEN CONTEXT, ANALYSIS OF CASE STUDIES CHOSEN FROM A GIVEN LIST TO RESEARCH RELATED TO CONSTRUCTIVE AND MATERIAL PROCESSES

PURPOSE OF RESEARCH FOCUS ON THE DEVELOPMENT OF THE SPECIFIC PROJECT, BUT LOOKING FOR LEARNING ABOUT METHODOLOGY THAT CAN BE APPLIED TO OTHER PROJECTS

2 FOCUS ON REACHING AND DEVELOPING A DESIGN SOLUTION INCLUDING FORMAL, SPATIAL AND CONSTRUCTIVE RESOLUTION FOR THE BUILDING, EVOLVING THE CONCEPT OF TECTONICS

THE DESIGN PROBLEM AND CONTEXT ARE WELL DEFINED AND GIVEN IN THE COURSE PROGRAM

FOCUS IS ON THE PROCESS, BUT ALSO TO REACH A FINAL PRODUCT AND PRESENTATION

3 THE DESIGN AND DEVELOPMENT PHASES ARE EQUALLY VALUED

THE PROCESS OF RECOGNITION OF THE CONTEXT, CASE STUDY AND PROJECT IS UNDERSTOOD AS IMBRICATED, SO IT IS NOT A LINEAR PROCESS, BUT A BACK AND BACK PROCESS

DESIGN PROCESS IS A SERIES OF STRUCTURED ACTIONS (ANALYSIS-SYNTHESIS-EVALUATION)

IDEALIZATION OF THE USER/PUBLIC/CLIENT, NOT WELL DEFINED, LITTLE KNOWLEDGE OF THE USER

4 DESIGN STARTS WITH CONTEXT ANALYSIS IN A PREDEFINED AREA FOR A PREDEFINED PURPOSE

ALL EXERCISES ARE RELATED TO ONE DESIGN PROBLEM

THE INITIAL EXERCICES ARE RELATED TO DRAWING ANALYSIS OF CASE STUDIES

STUDENTS WORK IN PAIR

RESEARCH, BY HAND AND DIGITAL DRAWING, PHYSICAL AND DIGITAL MODELING AND GROUP DEBATES ON THE PROCESSES ARE THE PRINCIPLE PROCEDURES

5 NO USER PARTICIPATION ON DEVELOPING THE DESIGN PROGRAM

EMPHASIS IS NOT ON THE PROGRAM, THE PROGRAM ISSUE IS SIMPLIFIED TO THE MAXIMUM

ONLINE

1 RESEARCH ACTIVITIES THROUGHOUT THE WHOLE PROCESS, BEGINNING FROM RESEARCH OF RECOGNITION AND SURVEY OF THE CHOSEN CONTEXT, ANALYSIS OF CASE STUDIES CHOSEN FROM A GIVEN LIST TO RESEARCH RELATED TO CONSTRUCTIVE AND MATERIAL PROCESSES AND SPATIAL ATMOSPHERE

PURPOSE OF RESEARCH FOCUS ON THE DEVELOPMENT OF THE SPECIFIC PROJECT BUT LOOKING FOR LEARNING ABOUT METHODOLOGY THAT CAN BE APPLIED TO OTHER PROJECTS

2 FOCUS ON PROPOSING A DESIGN PROBLEM AND DEVELOPING A DESIGN SOLUTION INCLUDING FORMAL, SPATIAL AND CONSTRUCTIVE RESOLUTION FOR THE SMALL SCALE INTERVENTION, ,EVOLVING THE CONCEPT OF TECTONICS

THE DESIGN PROBLEM AND CONTEXT ARE DEFINED BY EACH PAIR OF STUDENTS

FOCUS ON THE PROCESS, BUT ALSO TO REACH A FINAL PRODUCT AND PRESENTATION

3 THE DESIGN AND DEVELOPMENT PHASES ARE EQUALLY VALUED

THE PROCESS OF RECOGNITION OF THE CONTEXT, CASE STUDY AND PROJECT IS UNDERSTOOD AS IMBRICATED, SO IT IS NOT A LINEAR PROCESS, BUT A BACK AND BACK PROCESS

DESIGN PROCESS IS A SERIES OF STRUCTURED ACTIONS (ANALYSIS-SYNTHESIS-EVALUATION)

IN MOST CASES THERE IS INTERLOCUTION WITH WELL DEFINED AND REAL USERS

4 DESIGN STARTS WITH CHOOSING AN AREA AND FORMULATING THE DESIGN PROBLEM FOLLOWED BY CASE STUDIES EXERCISE FROM A GIVEN LIST

ALL EXERCISES ARE RELATED TO ONE DESIGN PROBLEM FORMULATED BY EACH PAIR OF STUDENTS

THE INITIAL EXERCICES ARE RELATED TO DRAWING ANALYSIS OF CASE STUDIES

STUDENTS WORK IN PAIR

RESEARCH, BY HAND A'ND DIGITAL DRAWING, DIGITAL MODELING AND COLLECTIVE DEBATES ON THE PROCESSES ARE THE PRINCIPLE PROCEDURES

5 IN MOST OF THE PROCESSES, THERE IS INTERLOCUTION WITH USERS FOR DEVELOPING THE DESIGN PROGRAM

THE USER'S NEEDS AND WISHES ARE TAKEN INTO CONSIDERATION, BUT IT IS ENCOURAGED TO THINK BEYOND PRESENT DEMANDS AND THE POTENTIALITIES OF THE INDETERMINATION AND TRANSFORMATION CAPACITY OF THE ARCHITECTURE

CONTENT AND APPLICATION OF DESIGN KNOWLEDGE

PA 4

IN PERSON

1 DESCRIPTIVE, OPERATIONAL AND EXPLICIT KNOWLEDGE

ARCHITECTURE DESIGN, DESIGN COMMUNICATION AND DRAWING, TECTONICS

CREATIVITY APPLIED TO BUILDING TECHNIQUES ASSOCIATED WITH FORMAL AND SPATIAL SOLUTIONS

INSTRUMENTAL USE OF ARCHITECTURAL THEORY (TECTONICS)

2 INTERDISCIPLINARITY FOCUSED ON MAKING: ARCHITECTURAL THEORY, DRAWING AND MODELING, STRUCTURES

EXPERIMENTAL APPROACH TO BUILDING TECHNIQUES AND MATERIALS

CASE STUDIES WITH OPERATIONAL INTENT - EXTRACTION OF CONSTRUCTION AND SPACE SOLUTIONS TO BE APPLIED IN THE PROJECT

COLLABORATION HAPPENS THROUGH DEBATES ABOUT PROJECTS BETWEEN GROUPS OF STUDENTS AND TEACHERS THAT PROMOTE COLLECTIVE EXCHANGES AND CRITICISM ABOUT PROCESSES

3 DESIGN PROBLEM IS WELL DEFINED AND GIVEN; CLEAR DEFINITION OF PHYSICAL, PROGRAMMATIC AND NORMATIVE INFORMATION

LOW COMPLEX CONTEXT, WELL DEFINED IN THE COURSE PROGRAM

4 CLEAR DEFINITION OF USER/PUBLIC, DETAILED IN THE COURSE PROGRAM

5 ARCHITECT PROVIDES A DESIGN SOLUTION FOR A GIVEN DESIGN PROBLEM; BY DRAWING

THE DESIGN OUTCOME IS A BUILDING

ONLINE

1 TACIT, OPERATIONAL AND EXPLICIT KNOWLEDGE

URBAN ANALYSIS, ARCHITECTURE DESIGN, DESIGN COMMUNICATION AND DRAWING, TECTONICS

CRITICAL THINKING AND AUTONOMY TO BUILD THE DESIGN PROBLEM

CREATIVITY APPLIED TO BUILDING TECHNIQUES ASSOCIATED WITH FORMAL AND SPATIAL SOLUTIONS, SUITABLE FOR THE PHYSICAL, ECONOMIC, SOCIAL CONTEXT

INSTRUMENTAL USE OF ARCHITECTURAL THEORY (TECTONICS)

2 INTERDISCIPLINARITY FOCUSED ON KNOWING AND MAKING: PROBLEM FINDING, ARCHITECTURAL THEORY, DRAWING, STRUCTURES

EXPERIMENTAL APPROACH TO BUILDING TECHNIQUES AND MATERIALS
CASE STUDIES WITH OPERATIONAL INTENT - EXTRACTION OF CONSTRUCTION AND SPACE SOLUTIONS TO BE APPLIED IN THE PROJECT. THE SELECTION OF CASE STUDIES HAS GAINED ACCURACY WITH REGARD TO SUITABILITY FOR LOCAL CONTEXTS.

COLLABORATION HAPPENS THROUGH DEBATES ABOUT PROJECTS BETWEEN ALL OF THE STUDENTS AND TEACHERS THAT PROMOTE COLLECTIVE EXCHANGES AND CRITICISM ABOUT PROCESSES

3 DESIGN PROBLEM IS CONSTRUCTED BY EACH PAIR OF STUDENTS WITHIN ESTABLISHED PARAMETERS (SMALL SCALE ARCHITECTURE RELATED TO PREEXISTENT CONTEXT WHICH CAN PROMOTE SIGNIFICANT CHANGES TO THE EXISTENT CONTEXT)

THE CONTEXT IS ALSO CHOSEN BY EACH PAIR OF STUDENTS, AND SHOULD BE A CLOSE REALITY TO THE STUDENTS

4 USER/PUBLIC ARE NOT GIVEN; IT VARIES BETWEEN THE STUDENTS

IN SOME CASES THERE IS INTERLOCUTION WITH USERS THAT MAY INFLUENCE DESIGN DECISIONS

5 ARCHITECT PROVIDES DESIGN OPPORTUNITIES; BY INTERPRETATION

ARCHITECT PROVIDES A DESIGN SOLUTION; BY DRAWING AND DIGITAL MODELS

DESIGN OUTCOMES ARE NOT PREDEFINED, BUT THE DESIGN OUTCOME IS A SMALL SCALE PHYSICAL INTERVENTION WITH DEFINITION OF THE STRUCTURAL AND CONSTRUCTION SYSTEM

Figure 6. PA4 Content and Application of Knowledge/ Design Process -Comparison

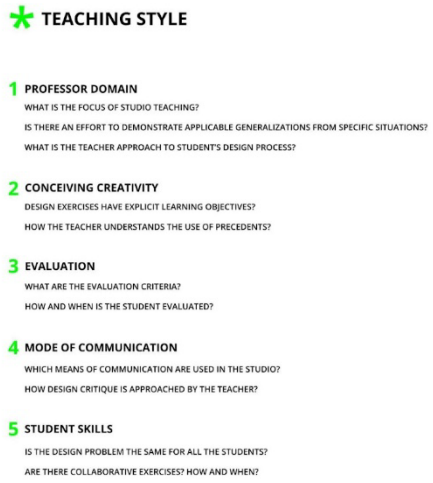

Figure 7. Teaching Style - Framing Questions

Teaching Styles: AI and PAIV

Virtual environment certainly alters teaching and learning design studio dynamics, traditionally based on an instructor focused, master-apprentice relationship. Much of this dynamic is made possible by the design studio face-to-face culture, where the teacher's technical-compositional skills define the didactics and where, despite assuming the cognitive authority of the discipline, the teacher can move around, making desk-crits to each students' demands. Remote teaching, in a way, equalizes practical and theoretical didactics insofar as it imposes the same frame on them.

In both AI's and PA4 and Pin's experiences, the platform migration did not, after all, mean a major change in practices. Specific contents are transmitted at specific times, apart from the actual application of knowledge in the studio. Desk crit is replaced by panel crit, but didactics are centered on the presentation of graphic material by each group and subsequent critique by the teachers. The case-by-case approach takes up most of the class time and makes it difficult for teachers to develop generalizable knowledge. It also hinders the possibility of revisions and reworks based on collective feedback.

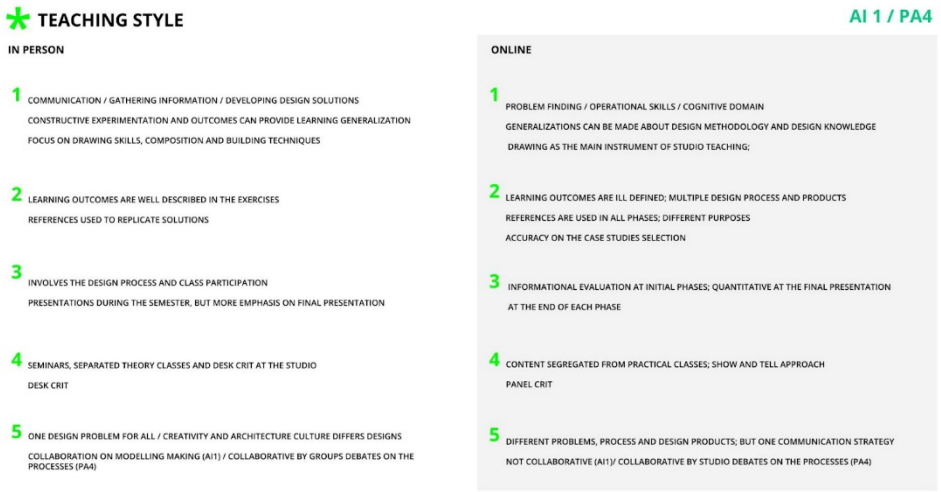

Figure 8. AI1 and PA4/PIn Teaching Style -Comparison

CONCLUSION

The last two decades have been a period of isolated, but stimulating, pedagogical experiences at DPA-FAU. Nonetheless, the lack of a structured environment cultivating epistemological and methodological research on design pedagogy results on efforts that fail to promote effective change. The remote teaching experience can be considered exemplary of the prevalence of a certain culture of design studio teaching practices and the role of design in educating the architect.

However, experience also shows that strategies that move away, even momentarily, from architectural solutions as inevitable outcomes of design investigation, manage to trigger more plural and organically innovative processes. Likewise, teaching exercises that break with traditional design procedures, like alternative initial tasks and problem finding issues, encourage the exercise of the cognitive dimension of design, reinforcing its methodological flexibility as an instrument for building knowledge.

NOTES

[1] Richard Foqué, “Design Research: The Third Way” (paper presented at the first EAAE/AEEA Conference: Doctorates in Design and Architecture, The Netherlands, Delft, February 8-10, 1996).
[2] Roberto Fernández, “Didáctica y Proyecto: Divergencias y Convergencias entre Profesión y Disciplina.” Registros: Revista de Investigacíon Histórica, 16, n. 1 (2020): 4-17, https://revistasfaud.mdp.edu.ar/registros/article/view/424/303
[3] Stravos Melissinopoulos, “From Pedagogy to Didatics: Claryfing the Discussion on Architectural Education” (paper presented at the First International Conference on Architectural Education, United Kingdom, Nothingham, April 4-5, 2013).
[4] Ashraf Salama, *Spatial Design Education: New Directions for Pedagogy in Architecture and Beyond* (New York: Routledge, 2016).
[5] The disciplines would constitute a single studio, working on concepts of tectonics.

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THE SYNCHRONY OF THE MULTIPLE INTANGIBLE FIELDS OF THE EDUCATION

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INTRODUCTION

Digital design programs dominate contemporary educational process for trainees. And for trainers too? How knowledge and experience of digital design and our digital existence on social media is transformed into an educational methodology and practice about design itself?
This paper presents the educational method for the design course on small scale constructions (spring semester of the 3rd year) at the School of Architecture NTUA for the ac. years 2020 - 2021, and propose, as an answer to the preliminary questions, a meeting of trainers and trainees in a synchrony of multiple intangible educational spaces / cognitive fields.[1]

The architectural issue

In a natural slope in the public space of the city of Athens, trainees were asked to design a 'balcony to the invisible side of the city'. The 'balcony': a section, a time delay, controlling the common presence of people. The 'invisible side of the city': sections at different cultural and historical levels of the city, section in space, on sound, on gaze. The issue: a mechanism for the construction of a recreation area _ intentional inertia.

The educational issue

The main issue in this specific architectural studies course is the integration of diagrammatic thinking in the design process, to give meaning to the continuity of the path from the definition of the design brief to the construction details.[2]

Methodological tools

The digital attributes of the course have afforded the following educational methodological tools:
1.The synchrony in participation of trainees and trainers in the monitoring of the process,
2.The synchrony in operation of different digital lab rooms, offering multiple specialization,
3.The synchrony in reference to the recorded diachrony of the design process,
4.The synchrony in combination of multiple, different sources of information.
With these tools it was possible to enhance the educational procedure, as it can be described by the tree graph in Table 1. The course was organized in three phases:
- 1st phase: initial conception of the idea of each group,
- 2nd phase: project elaboration and

- 3rd phase: project finalization,
while intermediate presentations with external guest jury made them distinct.

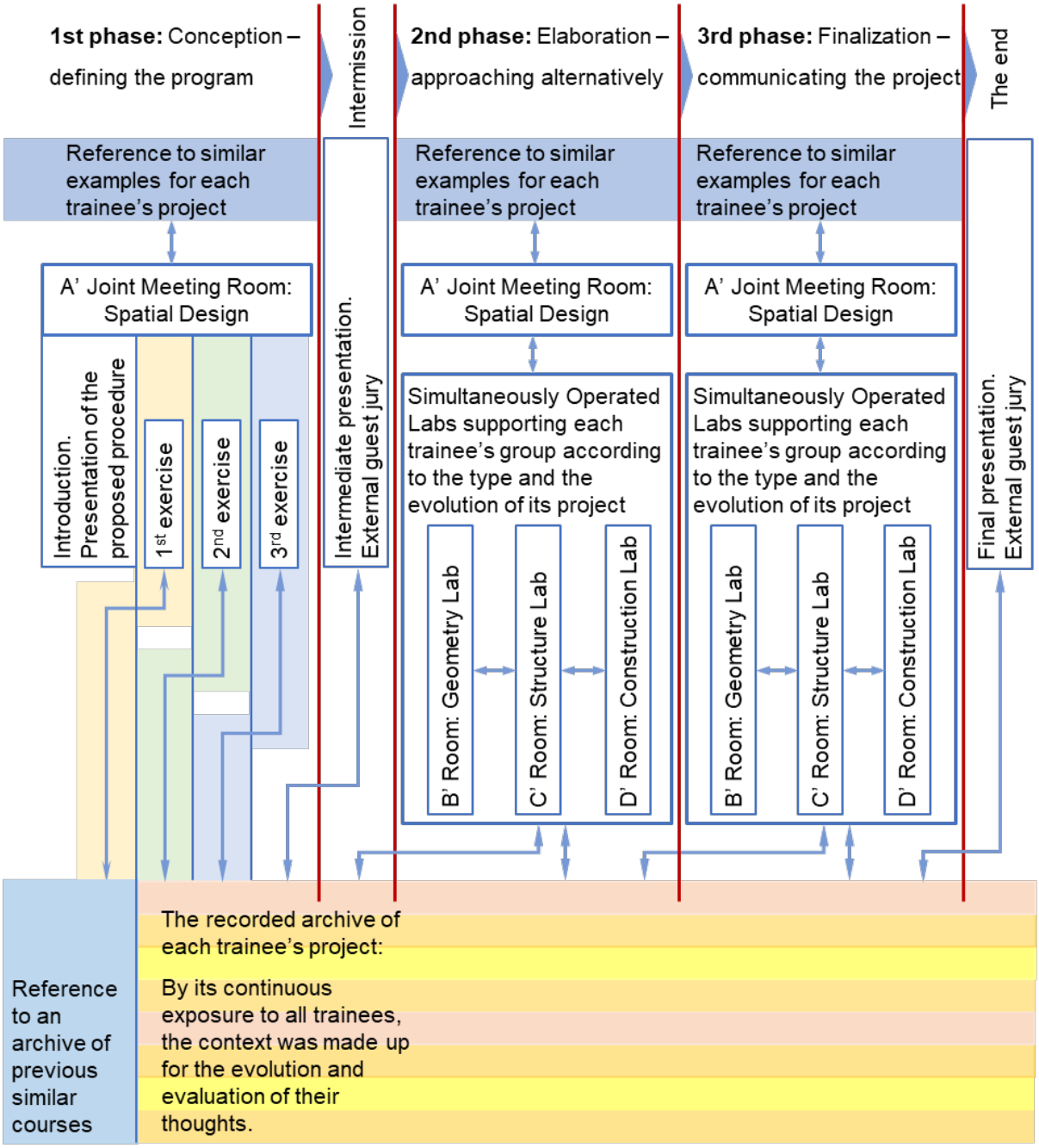

Table 1. The whole educational procedure can be described by a tree graph

At the 3-phases course, the methodological tools were supporting the process of transition from collective to personalized and from generic to specific:
- The 1st phase took place in the digital joint meeting room 'Spatial Design Lab', where all trainees and trainers participated in the monitoring of the process (methodological tool 1). The 1st phase was structured by three sequential individual exercises, to process the diagrammatic development of thought.
- The 2nd and the 3rd phase, in addition to the joint meeting 'Spatial Design Lab, were structured by three individual laboratories focused on geometry, structure and construction. These labs operated

separately in different digital rooms, and simultaneously according to the type and evolution step of each trainee's group (methodological tool 2).
- The process of keeping a record of the design production of each trainee's group unveiled the restoring of "lost" information and transformed the production time non-linear (methodological tool 3). Thus, the recorded archive of each trainee - the continuous exposure to all trainees, and the constant reference to this archive - made up the context for the evolution and evaluation of their thoughts. It was the context for evaluating the consistency of the multiple processed information in each design project.
- At each step, in the digital joint meeting room 'Spatial Design Lab', the reference to the recorded archive of each trainee's production made possible the support of the design process by combining multiple, different sources of information with synchronic feedbacks on the diachrony of the design process (methodological tool 4). The starting point was a reference to an archive of previous similar courses. Also, besides this internal reference to the course archives, additional references were made to similar examples of contemporary architecture, relevant to the processing phase of each trainees' project. This multiple reference system, that triggers feedbacks on different sources, has characterized the design procedure non-linear.

THE EDUCATIONAL PURPOSES

The diagrammatic thought and the integration of different description logics

By applying the methodological tools to the design process, two main educational purposes were met:
1st Educational Purpose: With the synchronic monitoring of the differences between the projects of the trainees, it became possible to emphasize that the integration of diagrammatic thinking in the spatial design methodology allows maximum flexibility in the further processing of the project and in the introduction / integration of multiple description logics, either predictable or unpredictable.
2nd Educational Purpose: With the synchronic treatment of different approaches to the project, it became possible to highlight the coordinating role of the architectural study in a project that requires the synergy of multiple design logics (structural engineer, mechanical engineer, luminaire, planter, builder, financier). All these dissimilar logics are coordinated by the architect at the topological field of diagrammatic thinking.

1st Educational Purpose. Integrating diagrammatic thinking supports flexibility in decision making during the design process

In the initial phase for the conception of the project with the three exercises, the trainees followed the gradual formation of the thoughts of each group of trainees through the diagrammatic description of the spatial relations.
-The 1st exercise concerned a field model, with the intention to diagrammatically identify the dynamic field of activities that could be developed in the specific material field. According to the framework of the design brief, which was given as an architectural issue, each trainee had to distinguish the material characteristics of the field.
- The 2nd exercise concerned the reconstruction of the model of the 1st exercise, reinforced by the differentiation of the material field according to the activities of the dynamic field that would be intentionally developed (the genre of use, space extension and time duration),[3]
- The 3rd exercise concerned a model of the area using as a background the initial principles of the project revealed in the 2nd exercise, delimiting individual areas of activity. The boundaries of social spaces would be related to the boundaries of the construction structure, integrating it into the same corpus of design ideas.[4]
With this process the trainees' projects differ as they start with their own diagram - description of the relationships, defined by the models and the title given to each project. An example of the verbal-

visual dual determination of the diagram is given in Table 2. Titles such as 'Framing the Phasmatic', 'Stop Thinking: See & Listen', 'Emerging Grid', Athens Telescope', Grid Trimming' support continuity between diagram specializations during the exercises.

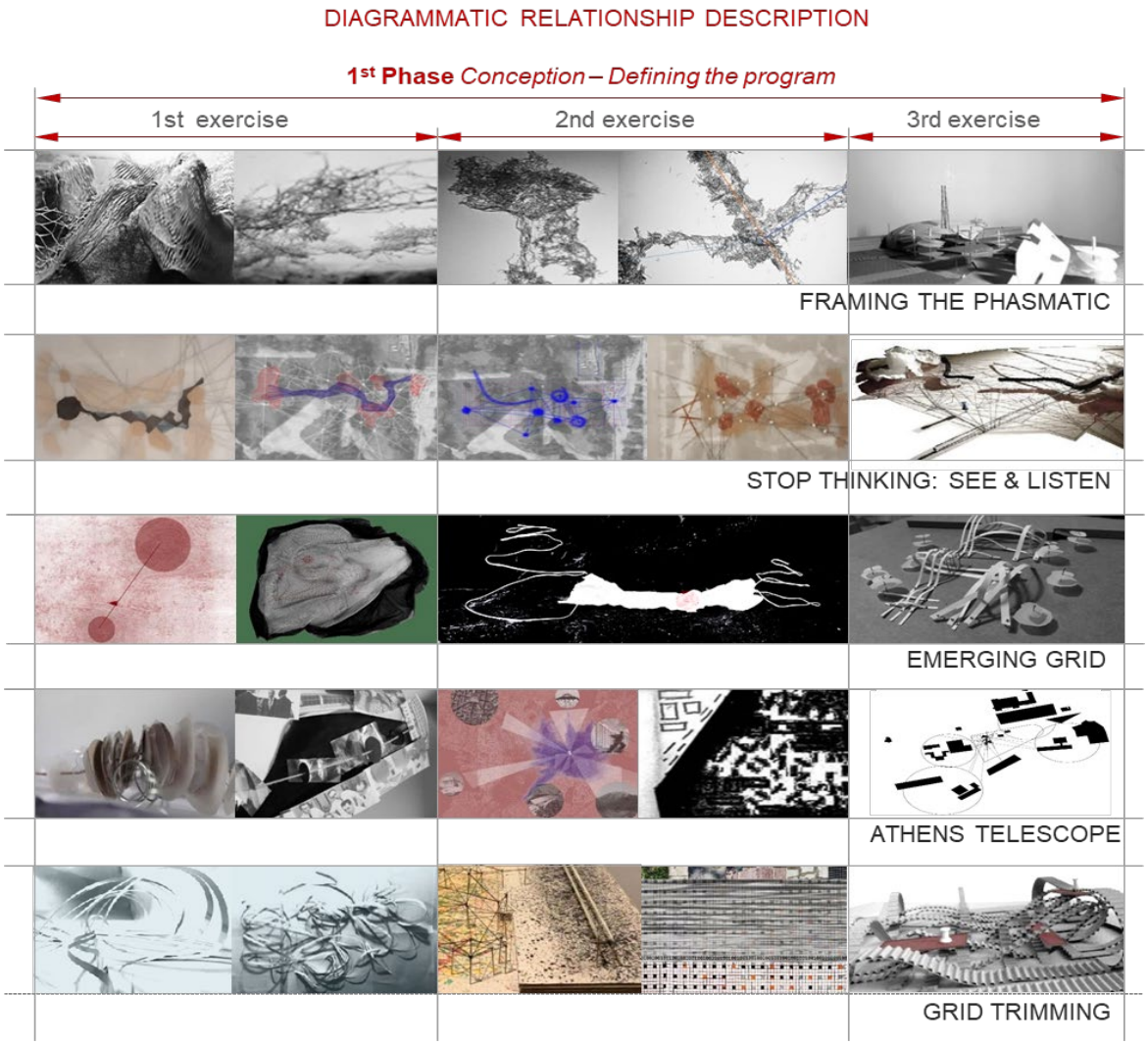

Table 2. 1st phase: Conception – Defining the program. The trainees' projects differs as they start with different diagrams-description of the relationships, defined by the models and the title given to each project

Trainees' projects were developed simultaneously: They were presented and discussed in the digital joint meeting room of the 'Spatial Design Lab', so that the multiplicity of possible approaches was common knowledge.

The diagram, as a mechanism for describing relationships, supports the perception of space as a dynamic field of relational transformations. With the diagrammatic description each group had its own starting point with each own relational rules. The further elaboration and specialization of the relations of each initial diagram led to the idiosyncrasy of each project, and the initial diagram was its signature.[5]

Subjectivity, as a parameter of idiosyncrasy, characterized every methodological approach of each group during the initial stage of the first conceptual diagrams, while later it was requested to be translated into a language of architectural design and finally to be transformed into a complete language of construction. During this procedure the time was manifested in two complimentary ways.

Synchronically, as a clear diversity of the design solutions proposed by different trainees in the same framework of the design brief. Diachronically, as a coherence of the distinctive style characterizing each trainee, paradigmatically illustrated by the unique, eventually inimitable style. Creation entails personal involvement and subjective gestures. It is the act of creating a personal signifier – eventually, a 'name for the subject'. It represents a reformulation of a crucially subjective 'something' into a 'common code', shared with other subjects.[6] Diagram is the tool to start and guide this reformulation.
Diagrammatic thinking defines a topological field, where the process of material formation is guided by a continuous maintenance of similarity with the relationships of the initial diagram in each alternative approach.[7]
Diagram < comes from the Greek word "δια-γράφω" which means the ability to make something by designing / writing and deleting it over and over again. The process of designing / writing and deleting the material formation produces a dynamic field of transformations, where the topological similarity between these alternative formations is ensured by the diagram, the description of the relations. What triggers this design / writing and deleting process are the different description logics that make sense in each sequel: Description logics for function, use, communication in different cognitive fields such as architectural, structural, mechanical engineering etc.[8]
The integration of diagrammatic thinking in the spatial planning methodology allows maximum flexibility in the further elaboration of the project, as the minimum design unit does not derive from a readymade material typology but is a relationship based on the diagram. With the diagrammatic description of the relations, the materialization of the project is open to multiple interpretations regarding the parameters of different cognitive fields. With the integration of these parameters the initial relations are increased respectively in a coherent, hierarchical network of relations. The ability to manipulate the openness of this network of relationships allows the introduction / integration of multiple descriptive logics into the project, either predictable or unpredictable.[9]

Table 3. 2nd phase: Elaboration – approaching alternatively the project through dissimilar description logics. A reference point to keep the fidelity to the initial diagram was the characteristic initial verbal / visual dual determination of the diagram

2nd Educational Purpose. From a tree diagram to a cloud of possibilities

At the 2nd and 3rd phase the trainees were continuously changing their positions and views, passing through different cognitive rooms / labs / fields of Spatial Design, Geometric Applications, Structural Mechanics, Digital Construction.

-At the 2nd phase for the project elaboration, the trainees saw the gradual formation of their abilities to conduct their project through dissimilar description logics. Through the difference of the description logics the trainees explored series of alternative approaches on the main diagrams of the 1st phase. A reference point to keep the fidelity to the initial diagram was the characteristic initial verbal / visual dual determination of the diagram, as at Table 3 all these were kept together.

Table 4. 3rd phase: Finalization – communicating the project. from the diagrammatic relationship description to the archive of alternative approaches and finally to the idiosyncratic project

-At the 3rd phase the communication of the project was based on the presentation of its consistency according to the record of the design process. For the description and reasoning of the project the trainees used the verbal and visual references of the recorded procedure. The context that could control and evaluate their cognitive tour was the record of their own concept transformations, starting

from the initial diagram, and certifying the fidelity of the alternative approaches to their initial intentions.

- Between the 1st and 2nd phase and also at the end of the course, trainees had to present their project in front of the external committee. This was the time for a reflection-on-action[10.] The result of the whole process had to be treated as a 'fragment of reality' that can be criticized, open to multiple interpretations with various description logics. Also, this was the time for the project's reasoning in a jury that was out of the context and had to be convinced of its consistency.

Visualizing the results of the design course with a multiple relational diagram, a cloud of information was designed, which was recognized as a common place of recording a collective practice and a place (s) of its multiple readings / forms.

The course was tree-structured with a specific sequence of phases, with discrete cognitive fields, and with productions in the different cognitive fields. However, the synchrony in operations and monitoring all of them, and the synchrony in feedback reports in the recorded diachrony of the process have transformed the tree course graph into a cloud of information. Synchrony of multiple intangible cognitive / training fields turned a tree process into a cloud navigation. As navigation followed the hierarchical network of each group of relationships, corresponding homeostasis [11] situations in the cloud were discovered: Situations where the network of relationships seemed to rest on a semantic consistency. In this homeostatic situation, clusters were distinguished in relevance with the semantic networks that allowed further elaborations / specializations, and also further verbal / visual design and reasoning in their context.[12] It works like a lingual mechanism.[13] In Table 5, four semantic networks are included in the cloud, with the combination of which there were further verbal / visual productions:

- the construction as core of design problem-solving (shelter – floor, camera obscura, repetition in a system, continuity of the gaze, multiple frame),
- the materiality as core of design problem-solving (wood, metal – metal, panels – glass, metal, metal – wood – glass, sealing membrane systems),
- the representation as core of design problem-solving (representation of the world's structure, navigation in the world),
- the detail as core of design problem-solving (section, node).

The synchronic treatment of different approaches of the project favors the understanding of the coordinating role of the architectural study in a project that requires the synergy of multiple cognitive fields and design logics (structural engineer, mechanical engineer, luminaire, planter, builder, financier). All these dissimilar logics are coordinated by the semantic consistency of architectural diagrammatic reasoning. During the design procedure the evaluating context of the project is gradually consisted, and everything can find a position in the semantic network of the diagrammatic relationships. This evaluating context permits evolutive transformations of the project by the integration of logics of different cognitive fields, as specializations in the semantic network. The diagrammatic thinking is a conceptual topological field, controlling the similarity between the transformations.

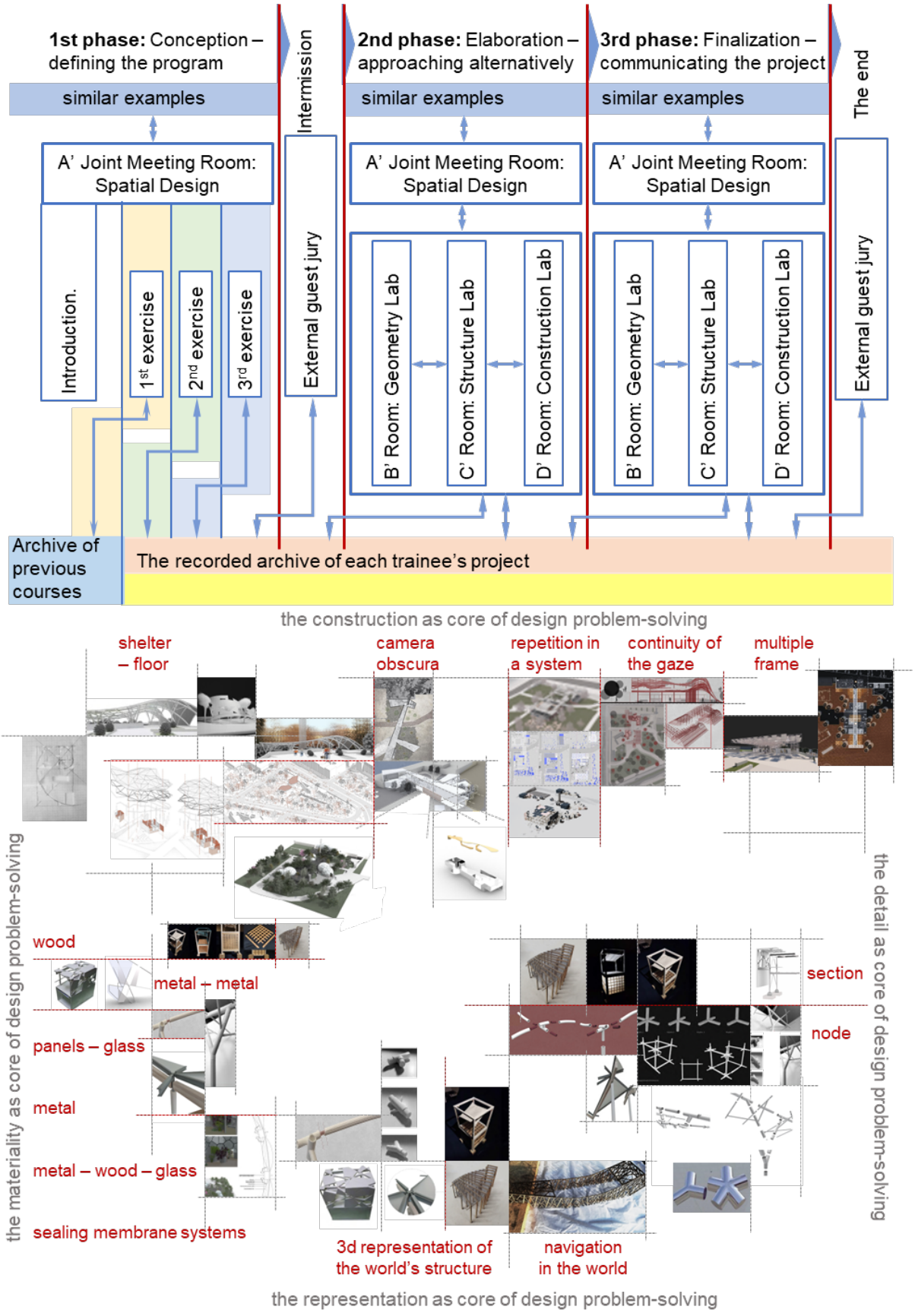

Table 5. From a tree graph to a cloud of possibilities

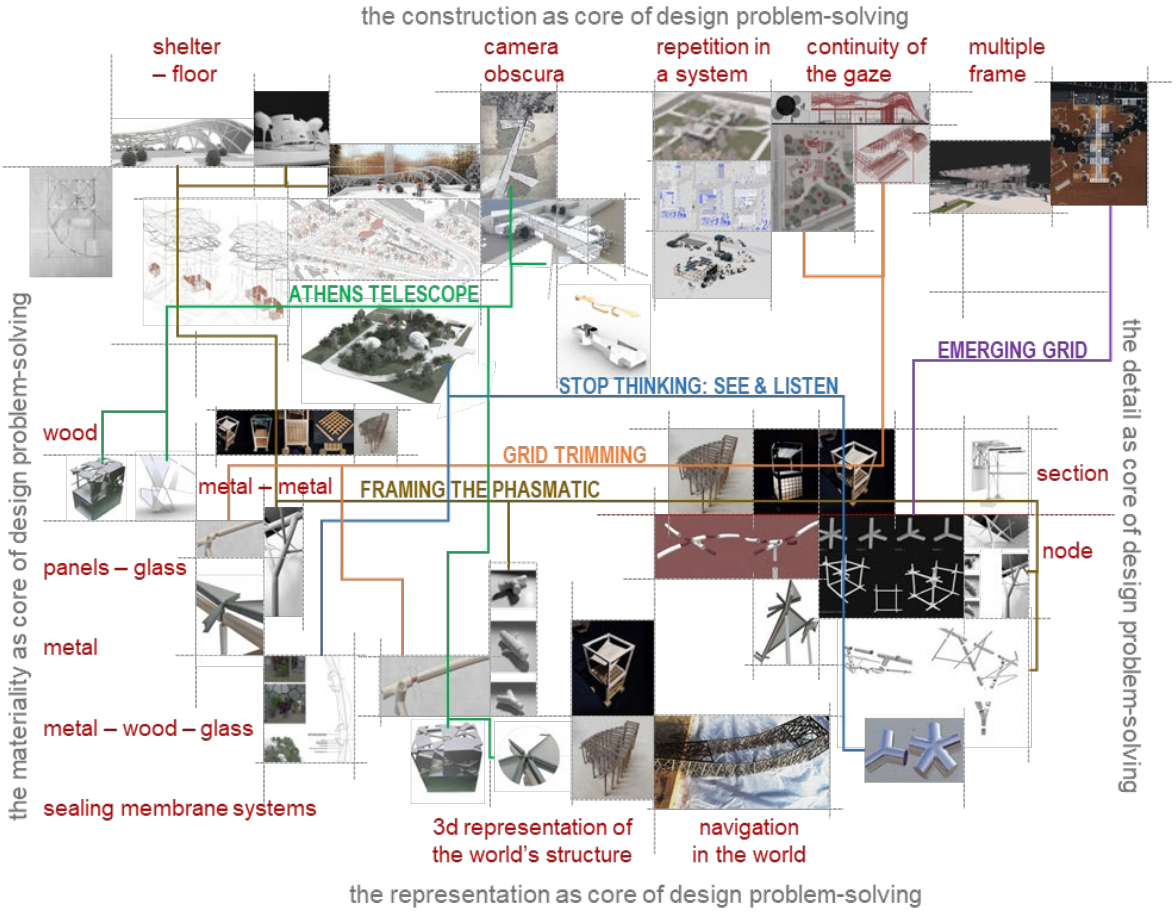

Table 6. The diagram as a semantic continuum between the clusters of the cloud.

CONCLUSION

The design of a common place/cloud: Navigating through multiplicity

In a design course with a basically tree schedule for a hierarchical, linear sequence of different cognitive fields, digital media allow synchrony to track decisions made in these different cognitive fields. In this way, knowledge is not identified and recognized only in the context of each cognitive field. Synchrony permits the fusion of the cognitive fields. And then cognitive elements of the various fields loosen their bonds with their initial context, and new clusters emerge, forming a cloud of information.

With digital media the whole group of trainees and trainers was monitoring the multiple tours of thoughts that started from the same architectural issue and finalized with different design outputs. This difference is the idiosyncratic attribute of each project; it is the result of the initial diagrammatic relationships proposed by each trainee's group and of the consistency of the process of specializing these relationships. Besides the full participation in the monitoring of the design process, the recording of the design process reveals the information that a project carries. Archiving of the design process permits the synchrony of the phases in the evolutive transformation of the project. A compilation of the verbal / visual acts from the starting point till the end constitutes the context to describe and evaluate the project; it is the reality that design process refers to.

The constituted context is a common place / cloud of all the information inscribed in the design process. In this cloud, synchrony has opened typological symbols to multiple interpretations, deconstructing ready-made / transcendental semantic relationships. Each design decision is related to all information. It is related to the multiple visual / verbal "etymology"[14] that has been established in different cognitive fields and directs semantics in a contemporary context of reflection.

The basic tool for navigating cloud multiplicity is the diagram. In Table 6, the diagram of each trainees' group functions as a semantic continuum between the clusters of the cloud. With diagrammatic thinking, a multiplicity of reconstructions of semantic relationships is possible, offering a verbal / visual reasoning extracted by the diachrony of the design process. The diagrammatic description of the relationships and the reference to fidelity criteria in these relationships through the differences of alternative approaches, allow unlimited transformations of the project, while maintaining the basic similarity with the original conception.

The delimitation of a common place / cloud with its partial semantic networks described in diagrams is a mechanism for the design processing of the project and a cognitive basis of a methodology to approach future design issues.

NOTES

[1] Specialized trainers in the labs:
-Geometric Applications: Nikos Kourniatis, assistant professor, University of West Attica.
-Structural Mechanics: Demetrios Tsaparlis, civil engineer, PhD candidate, and Antonis Takasis, civil engineer.
-Digital Construction: Eve Fraggedaki, architect, laboratory teaching staff NTUA and Pantelis Stefanis, Shipbuilder mechanical engineer, architect, PhD candidate.
Groups of trainees, architecture students, whose projects are mentioned:
-'Framing the Phasmatic': Christin Marasoglou and Eugenia Kovotsou.
-'Stop Thinking: See & Listen': Evangelia Skoufi.
-'Emerging Grid': Korine - Iren Apostolaki and Angelic - Christin Maglara.
-Athens Telescope': Kaliope Doska and Anne Sachtouri and Iren Chalali.
-Grid Trimming': Marianthi – Iren Krouskou and Zacharenia Spyrou.
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Richard Boyd, 'Metaphor and Theory change: what is 'metaphor' a metaphor for?', in *Metaphor and Thought*, ed. A. Ortony (N. York: Cambridge University Press, 1993).
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RECEPTION-BASED COGNITIVE EMPOWERING APPROACH TO TEACHING-LEARNING IN ARCHITECTURAL DESIGN

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INTRODUCTION

The architectural profession experiences a drastic transition; compared to any other profession. It never adopted feedback guided by all stakeholders and empirical research, especially in the cognitive realm. The notion that education is a process of socio-cognitive learning and human transformation is not adopted in teaching and learning practices. The curriculum and syllabus are designed by domain experts relying on their intuition and experience rather than a systemic applied instructional design theory. This research attempts to understand the challenges of architectural graduates in the profession; in the wake of changing roles. Studies conducted with stakeholders, particularly fresh graduates, reveal that it is high time to look into the content and course delivery methods to enhance learners *'cognition-based learning and empowerment*. This paper deals with design studios in architectural education in India. Further, the advantages of reception-based cognitive approaches to design studios are put forth.

PURPOSE OF EDUCATION

Education is critical for the long-term proficiency, growth, and development of nation. Social knowledge, prosperity, self-reliance and innovation increase with education. A man without education is like structure without foundation. Education is meant to develop minds, not just careers. If education is vital to a community or nation, then the quality of education must also be vital. Also, professional quality is known to be linked to educational quality. Higher education contributes to the nation's long-term livelihoods and economic development.

Architecture as profession has significant connotations for environmental promotion, biodiversity preservation, ecology, sustainability, creating optimal indoor living conditions, reducing global warming and carbon footprints, and resource-efficient buildings. Making education more relevant and empowering for students is critical in this period. Due to rapid urbanisation and migration, "India requires 700-900 million square metres of built space each year to meet the ever-increasing demand for shelter, employment, education, healthcare, recreation, trade and commerce, and industry". [1] India needs more architects because its architects' population density is *1:13247*, compared to USA *(1:3000)*, Italy *(1:400)*, and Greece *(1:540)*. [2]

Methodology

The research methodology adopted for this study is qualitative in nature. The research framework is given in figure 1.

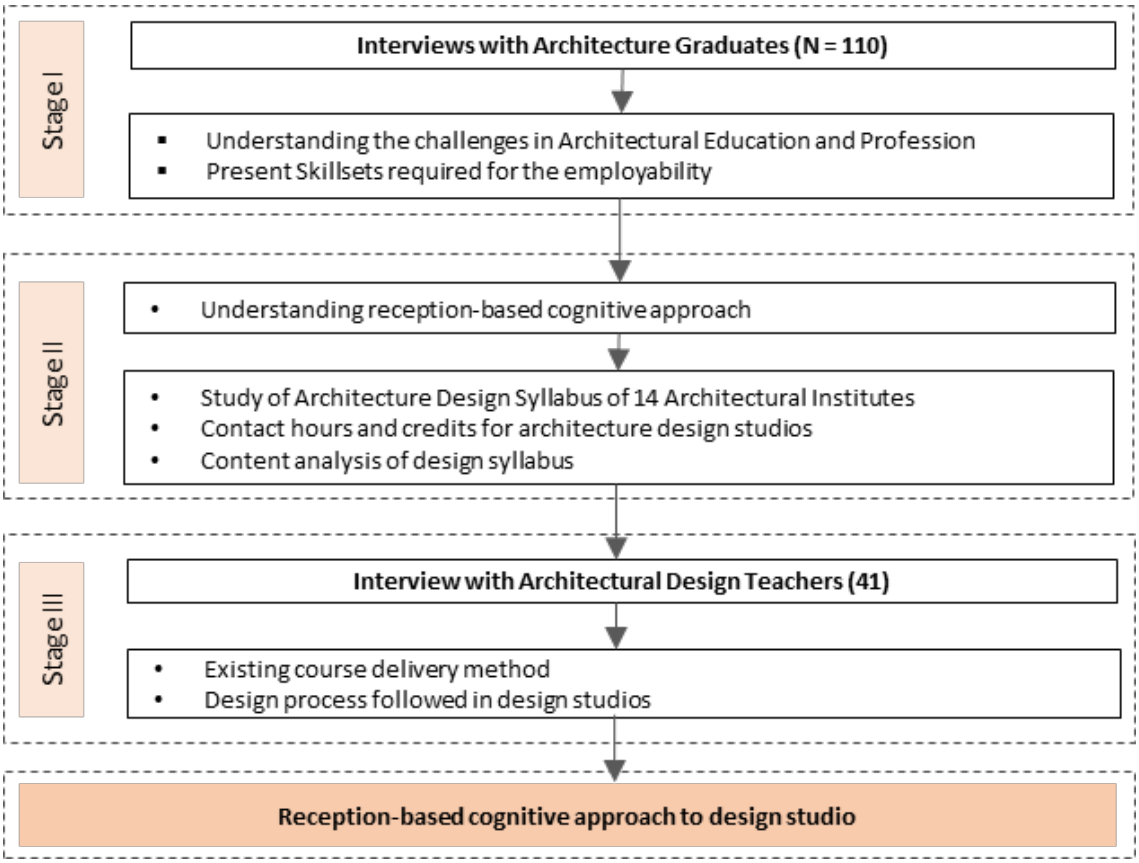

Figure 4. Research Framework (Source: Authors)

ARCHITECTURAL EDUCATION IN INDIA

The Indus valley civilization identifies the 2600 BCE as the genesis of Indian Architectural Education. The construction of this civilization provided a canvas for the birth of profound wisdom, propagated through oral traditions, and manifested in *Vedas* (1700 BCE). At that time, architectural teaching happened through practice and theoretical discourses, i.e., the initial form of design-build. It was rooted in traditional socio-cultural wisdom. However, prolonged wars, invasions by the Mughals and Afghans, and the Imperialism with British colonization degraded the education system that prevailed then. They later adopted the course to meet their labour and vocational resource demands in colonies, teaching drafting techniques and replicating construction elements, initially neglecting to educate and empower.

Post-independence, 1947, there were four Architectural colleges, 12 in 1972, 50 in 1991, 177 in 2010, 463 in 2020, and the number has gone to 480 in 2022. [3]

University Grand Commission (UGC) classifies institutes of India into five categories, i.e., autonomous higher educational institutes, central universities, state universities, deemed universities, and state private universities.

There is intense debate and scrutiny about the quality of architectural education to ensure that "education imparted remains relevant to the context and challenges faced by society, state, and nations, both locally and globally". [4] The architecture profession faces numerous challenges and threats due to rapidly changing construction technologies, new materials, building footprints and

professional practises. Design and construction strategies have changed, posing new challenges to architectural profession and professionals. [5] Professionals need various skills, knowledge, experience, expertise, capacities, and capabilities to effectively and efficiently meet these challenges. Architecture is now seen as an extension of new technologies, materials, design and structure innovations. As a result, architectural institutions are scrambling to find new patterns of architectural pedagogy and order in order to meet these rapidly emerging challenges and threats. Existing architectural education requires careful examination, analysis, rationalisation, review, and redefinition in order to be more relevant to Indian ethos, culture, environment, ecology, climate, and the needs of multi-layered society and communities.

Many other professional skills are required to support the profession, making architectural education extremely complicated. As a result, since its inception, the issue has been heatedly debated and discussed. Historically, the method of imparting architectural education has changed in intent, content, scope, and delivery. Given its dynamic nature, the process has constantly been evolving and devolving.

The Indian Architects Act 1972 has defined the context of architectural education by enacting Minimum Standards of Architectural Education, which was first done in 1983 and was recently redefined in 2020. [6] Additionally, the National Education Policy 2020 of the Government of India is attempting to reshape Indian education in order to make it both national and global. [7] It emphasizes employability and skill enhancement through self-reliance, localization, globalization, and economic liberalization. It also addresses the United Nations' challenges and agenda outlined in the SDGs.

CHALLENGES FACED BY ARCHITECTURAL EDUCATION AND PROFESSION

Stakeholders in architectural education include students, teachers, management, regulatory agencies, and infrastructure. These are the critical determining factor of the quality of architectural education. Face-to-face interviews with 110 architects were conducted to understand the challenges that architectural graduates face. Content analysis was used to make inferences regarding the challenges faced in architecture education and profession. These challenges were

1.Outdated syllabus
2.Teacher-centric approach
3.More emphasis on theoretical knowledge than practical application
4.Focus on the product rather than the process
5.Lack of research in architectural education
6.Lack of empowerment and employability skills
7. Academic and industry disconnect
8.Blindly following the western norms and ignoring the traditional context-based architecture.
9.The architectural education system is still rooted in old British thought and philosophy.

COGNITIVE, EMPOWERING APPROACH TO TEACHING-LEARNING IN ARCHITECTURE

The ability to educate India's youth will determine the country's future. [8] Students must learn and learn how to learn in a rapidly changing knowledge, employment, and global ecosystem. Education must gradually shift from teaching content to "think critically, solve problems, be creative and multidisciplinary, innovate, adapt, and absorb new material in novel and changing fields. Education must become experiential, holistic, integrated, inquiry-driven, discovery-oriented, learner-centred, discussion-based, flexible, and enjoyable". [9] Education must help students develop character and prepare them for profitable and satisfying employment. Architectural education must be made more vibrant, realistic, rational, and focused by focusing on emerging ground realities, understanding changes in construction technologies, involving state-of-the-art technologies, redefining teaching

curricula and syllabus, changing teaching methodologies, making teaching more practical, and promoting research.

Reception-based Cognitive Approach

Human beings have two independent verbal and nonverbal information processing channels so that the information can be processed through dual coding with the help of attention and perception. Emotional aspects mediate learning by enhancing the learner's cognitive engagement, resulting in learning gains. [10] As shown in figure 2, instructional media is used through five different sensory perceptions. Once the information comes in the working memory where it goes to verbal and non-verbal processing. From there, semantic and episodic knowledge is built-up, which forms the basis on which the understanding happens. Long-term memory enables us to retain information for extended periods. [11] Attention and perception play a significant role in learning. "Attention is our ability to focus on specific stimuli, ideas, or events for further processing in working memory, and we can control where we direct our focus of attention". [12] Perception is the making sense of a given situation. Perceptions are based on past experience, context, needs, goals, and expectations.

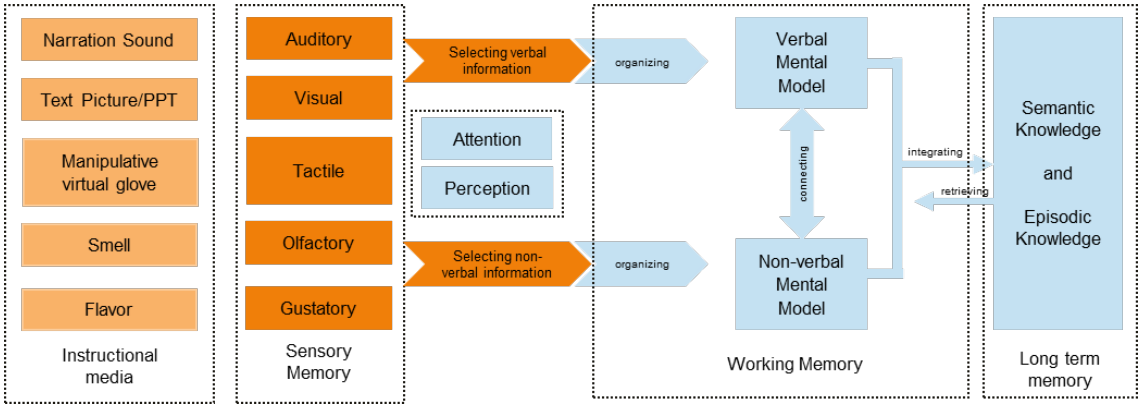

Figure 5. Concept of Reception-based cognitive pedagogic tools based on Roxane Moreno's "Cognitive-Affective Theory of Learning with Media

The learning process begins with information processing within information channels, then merges into a comprehensive verbal or visual model, and concludes with the creation of new knowledge. [13]

Architectural Design Studios

In India, the Bachelor of Architecture is a five-year course divided into ten semesters. The architectural design studio is divided into stages I and II. Stage I comprises the first and second years. The first year is dedicated to spatial explorations as well as the conceptual design and construction of a single functional building. The second year is about residential and rural architecture and multifunctional community building types on an intermediate scale. Stage II comprises the third, fourth, and fifth years. The third year involves multifunctional public buildings, commercial and residential complexes, and institutional buildings. The fourth year is about complex buildings in the urban context, i.e., mixed-use buildings and real estate projects. The fifth year is the thesis or capstone project.

To understand the core content and credits, 14 institutes were analyzed. It was then compared with the Council on Architecture (CoA) minimum regulation 2020 and the All India Council for Technical Education (AICTE) model curricula. The Council of Architecture prescribes 75% of the syllabus content; 25% of the freedom is given to institutes to imbue the regional context and current

technologies. The credit score also changes based on the content and the emphasis on regional context. Figures 3 and 4 show the variation in architecture and design studio stages I and II.

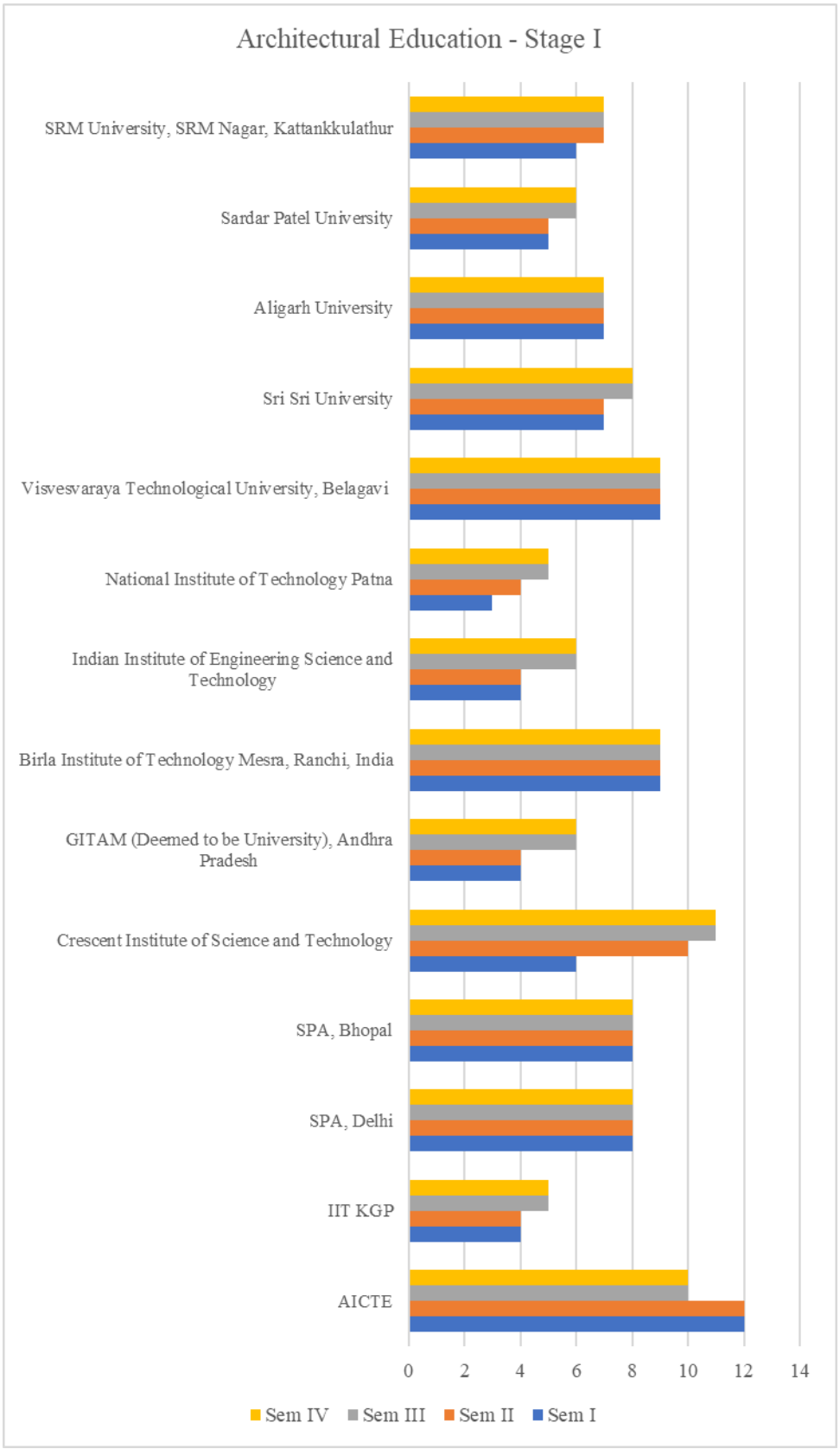

Figure 6. Design Studio Credits per Semester in Stage I (Source: Authors)

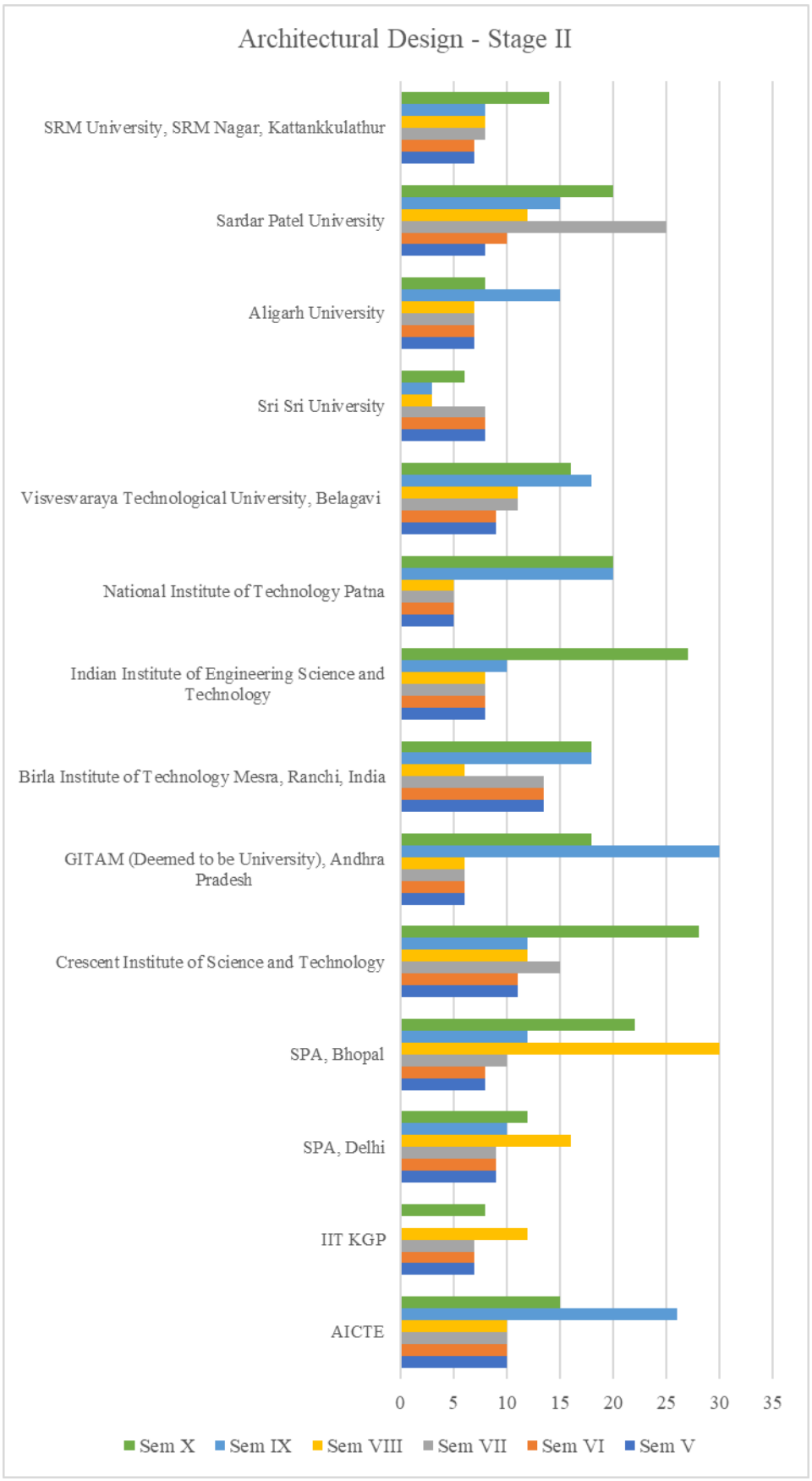

Figure 7: Design Studio Credits per Semester in Stage II (Source: Authors)

Reception-based cognitive approach to design studio

Students' learning outcomes can be improved using reception-based cognitive approaches. The teaching-learning approaches can be experiential learning, collaborative learning, blended learning, real-world projects, and applying new ideas, materials, and technology relevant to changing societal needs. Incorporating technology into the teaching-learning process, such as teaching 3D technologies, Virtual Reality, and BIM, will enhance students' outcomes. Architectural education should be student-centred; focusing on process rather than product. Along with applying core knowledge, developing new skill sets, capacities, and capabilities should be the main aspects of design studios. Videos are the "best option for teaching architecture and experiencing architecture". [14] It helps in connecting with the masses and communities. It brings out the imagined/realised spaces to life, expanding students' horizons and thinking about design. It helps communicate the experience of places for those who cannot experience them first-hand. It makes architectural education truly global in nature.

Design teachers should be both practical and theoretical architects who can explain the design's intent and see it through to its logical conclusion of successful implementation on the ground. With time it is important for design teachers to keep themself updated with excellent communication skills, field experience, most recent subject knowledge, and interface with professionals. Design teachers should also prepare well-researched and qualitative handouts for students to understand the different aspects of design. Reception-based cognitive approach illustrated in the stages of design process (Figure 5).

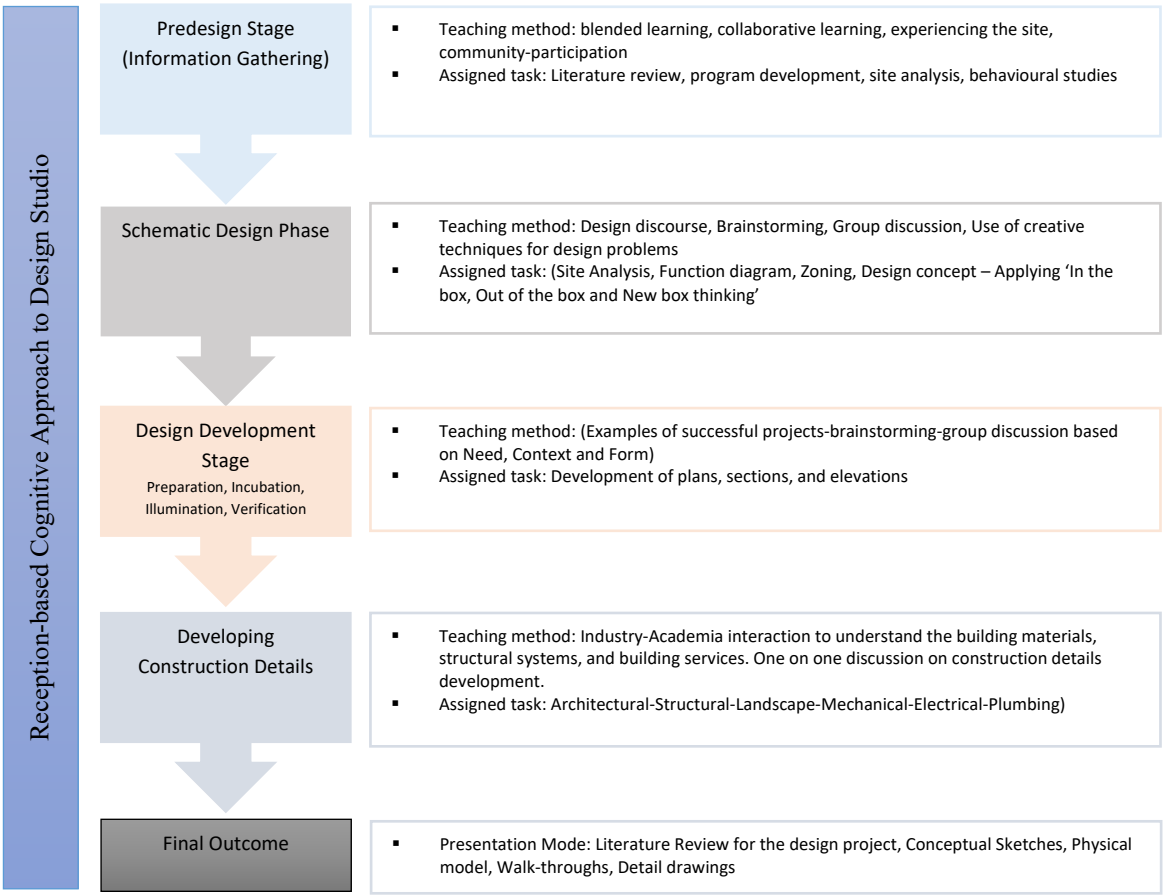

Figure 8. Reception-based Cognitive Approach to Design Studio (Source: Authors)

As far as possible design lectures should be "pre-recorded and split into twenty-minute presentations, since it's the maximum concentration span of students". [15] VR multimodal teaching and learning will enhance learning experience. [16]

Design thinking is the five-stage model of creative process (Figure 6). Creative thinking is a skill that can be learned rather than a talent. It empowers people by enhancing their natural abilities, which improves teamwork and productivity. [17]

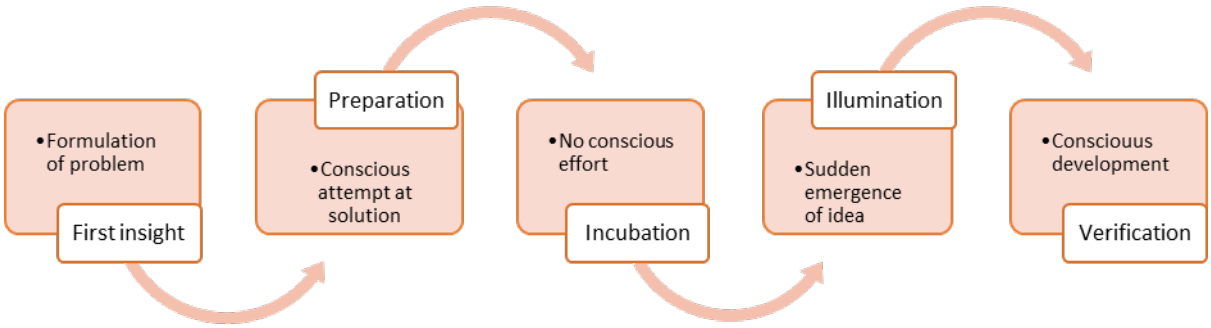

Figure 9. Design Thinking Process (Source: Authors)

The creative techniques that can be used for ideation, incubation and illumination are matrix of ideas, brainstorming, random combinations, abstraction, and transformation.

The use of maxims can be a guideline for teaching. It helps lesson planning and students learning needs and develops students' creative capacity. Maxims are procedures/ rules for presenting concepts to make teaching more effective. Examples of a few maxims are known to unknown; deductive to inductive; simple to complex; particular to general; concrete to abstract; indefinite to definite; whole to part; psychological to logical; analysis to synthesis; empirical to rational.

CONCLUSION

In architecture, the primary employment sector is industry, corporate, research firms, and academia; these call for the architectural understanding of scientific principles, materials and technology, software, and the like. The professional practice of architecture, whether individual or incorporated, requires a more profound spatial understanding, which demands the involvement of five senses and the sixth sense is kinaesthetic. The teaching-learning based involvement of all senses, i.e., enhancement from basic and visual audio senses to the third level of tactile or tactility, would enhance the perception to a far deeper level. If the curriculum and teaching-learning methods are oriented towards a reception-based approach, it will make a significant difference in the learner's cognitive ability. The increased cognitive ability will lead to a deeper understanding and comprehension of the subject learn to, resulting in an enhanced level of empowerment which the current employer's demand. Such an empowering approach would only add to the value of education and make graduates more empowered to be employed.

NOTES

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[3] S. Dua and K. S. Chahal “Scenario of Architectural Education in India”; Tiwary Anurag and Singh, Priyanka. “Reimagine India’s Education Narrative.”
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[6] Jit Kumar Gupta and Rashmi Ashti.
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[10] Tahira Anwar Lashari, Maizam Alias, Mohd Jahava Kesot and Zainal Abidin Akasah. “An Affective-Cognitive Teaching and Learning Approach for Enhanced Behavioural Engagements among Engineering Students”; Surat, M., N.A.G Abdullah, M.M. Tahir, M.F.I.M. Nor, and N. Utaberta. “An Effective Teaching and Learning Approach for the Architectural Program with Reference to the Framework of Educational Psychology”; Matthew T. McCrudden and Danielle S. McNamara. *Cognition and Learning*; Barry Kort and Robert Reilly. “How People Learn: Cognition, Affect, and Learning-The Role of Emotions in Learning.”
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THE ROLE OF NARRATIVES IN TRANSDISCIPLINARY ARCHITECTURAL STUDIES

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INTRODUCTION

Architecture is considered a serious design activity that deals with the various aspects of life in physical and virtual dimensions. As a profession, architectural education now leads not only to building design, but also from basic building design to interior design, designing film sets to virtual environments such as animated digital games, and designing VR are just some of the many subfields of the architectural profession. This complex diversity also affects architectural education.
In addition to traditional manual drawing, model making, and freehand drawing, the use of digital software as presentation tools, digital models, 3D printers, and machine learning[1] processes are now part of architectural education. This increases the importance of transdisciplinary studies in the field of architecture and narratives, which play an essential role in this diversity. Despite all the development in the field of architecture and other disciplines, narratives are the essential part of them. Narratives connect people to their physical environment in every form. Regardless of what profession we adopt after formal architectural education, the focus of pedagogy in design studios should be on thought-provoking architectural ideas able of initiating a new debate in society. To achieve this goal, transdisciplinary experimental studies play an important role in developing thought-provoking ideas, with narratives acting as a binary force between architecture and other disciplines. Renowned theorist Professor Alberto Perez-Gomez discusses the transdisciplinary study of architecture and literature in his book, he writes: “The Linguistic Dimension Of Architecture: Attunement, he writes “…Indeed the embodiment of gods as events, moods, or atmosphere in literature may thus function as a point of departure for our own projects of lived space… In novels in and in dramas, for example, spatial atmosphere are evident whenever the moods, feeling, or motivations of protagonists are shown to be affected by environment." [2]

LITERATURE REVIEW ON PEDAGOGY NARRATIVE ARCHITECTURE

In transdisciplinary studio, my focus would be on the mutual boundary of architecture and literary narratives from different perspectives. Much has been written about it. The most common and traditional role of literature in architectural education is "The Invisible Cities"[3] by Calvino, which is very effective in teaching the invisible layers that lie beneath physical materiality. In contemporary works, "Narrative Architecture"[4] by Nigel Cotes is an important book that discusses possible narratives in the experience of small objects to the city and offers a different perspective on narratives in spatial experiences. Klaske Havik discusses the role of literary narratives in analyzing urban/architectural situations in “Urban literacy, Reading and Writing Architecture”[5]. This book has

an extensive debate on the experience of urban spaces through different forms of narratives, i.e., description, transcription, and prescription. The analytical study of the gradual unfolding of architectural spaces, which like narratives reveal the events step by step, is presented in the book "Architecture and narrative: the emergence of space and cultural meaning"[6] by Sophia Psarra. In parallel with these works, in which the focus of architectural research is on the experience of space that underlines possible narratives, there are some exemplary works that consist of a collection of analytical studies in which architects analyze the short stories of renowned writers that contain more experience of architectural space in their narratives. The book "Telling spaces"[7], edited by G. Corbellini, and "Reading Architecture"[8], edited by Sioli, A. and Jung, Y., contain essays having discussions on significant spatial settings in their narratives, an important study for architects and urban planners. The literature I have discussed above plays an extensive and essential role in studio pedagogy at various levels. David Spurr writes, "Architecture, as the art of building, gives concrete form to the external world according to the structures of imagination; whereas literature, as the art of written language, gives symbolic form to the same world."[9]

THE ROLE OF LITERARY NARRATIVES IN STUDIO PEDAGOGY

Narratives are the way we experience something, and we can explain them in different forms of expression. However, in transdisciplinary studies of architecture and other disciplines, written and visual narratives play an essential role in design explorations. By using them, we link the two different experiences through words and drawings and then develop the idea further. In transdisciplinary studio pedagogy, we use narratives as a tool to develop and streamline imaginative creativity. The literary narratives have a unique virtual experiential space that the reader perceives as they move through the narratives. Renowned architect Yoshio Taniguchi says of architectural experiences, " Architecture is basically a container of something. I hope they will enjoy not so much the tea cup, but the tea "[10] In the case of literary narratives, either writing our own narrative or processing an existing narrative, we as readers get the same experiential space Taniguchi talks about, but without a container. In constructing narratives, we try to capture the desired experience through narrative writing and then design a container for that experiential space. Often we cannot find a suitable container, but that does not mean that experience has no value. Whether we have a container or not, in the narrative design studio, the experiential space comes first.

Narratives are not a static experience, but unfold in a linear fashion with strategic pauses. These pauses provide ample time to absorb and process the segmented experience of the narrative. The reader is disconnected from physical reality and forced to traverse the journey narrated by the writer/architect. Unlike description, narrative writing adds emotional and philosophical depth to the imagination. Our scattered thoughts or raw ideas become meaningful only when we give them a visual form of words on paper. The precise use of exaggerated language[11] and poetic expression to present the idea is an essential part of narrative pedagogy in the design studio. Writing a thought-provoking narrative requires refinement and clarity of ideas. It's not just the words that matter, but how we put them together into sentences. This is not formal literary writing learning, but rather we use narrative as a tool for discovering architecture. We do not directly address the social, moral, or philosophical arguments, but rather the possible consequential space under the influence of these representations.

NARRATIVE AND PRAGMATIC CONSTRAINTS

Narrative is the driving force behind architectural design and program. The functionality of space in relation to program distinguishes architecture from other forms of expression where the only function is to "present an idea" without any formal activity. The pragmatic constraints keep architectural space grounded in reality, creating great resistance to the narrative design process. Viewing architecture as a

problem-solving tool and primarily creating a physically comfortable space is a very basic approach to architecture. In a real sense, architecture begins after the basic understanding of the physical requirements of the space, but it does not end there. By using narratives, we try to minimize the role of pragmatic constraints in the design process and increase the importance of ideological perspective. The main function of architecture is to raise questions in order to initiate a debate in society. In this struggle, designers should invent new programs or redefine the experience of existing programs according to ideology. In this case, the functionality of a program is based on its ability to express a thought-provoking idea, rather than on the fulfillment of pragmatic functional efficiency.

NARRATIVE AS A TOOL FOR DISCOVERING TRANSDISCIPLINARY ARCHITECTURE

In transdisciplinary studies, narratives provide the mutually shared space between architecture and the other disciplines where new ideas can take birth. Using narratives as a tool for discovering architecture is a complex process in studio pedagogy that involves five steps. The first step is to identify the core question and formulates a thought-provoking statement. After this, we narrate a fictional event inspired by the first statement that echoes the message from the other discipline. In doing so, we use exaggerated language with poetic expression. The exercise of writing a narrative requires long brainstorming sessions to gain maturity and direction. The next phase is to translate this textual narrative into a visual narrative by drawing abstract expressions. By giving visual meaning to the initial idea, we seek to transform the textual experience into a visual experience. Students have complete freedom to make experimental drawings to capture the true essence of the narrative. The debate over literal[12] or non-literal and direct or metaphorical representation becomes part of the studio discussion at this stage. The transformation of two-dimensional images into three-dimensional models is the next stage of design. As in writing the narratives and drawings, here we do not construct the vessel with the idea of habitable space, but we model the desired habitable space directly with plasticine or clay and then subtract it off the plaster mold. The plaster mold becomes the habitable space. It is the direct transformation of emotional, spiritual ideas into a molded space through the magical touch of the hands[13]. It is more about the way of conceiving the space than perceiving it. After this phase, we write a spatial narrative inspired by the experimental space. This narrative is the experiential story of a formal, habitable space derived from a narrative. Through this process, we gradually develop the concept, materiality, program, and design of the space into a unified form, leaving no gaps or voids for intrusive thought. The narrative design process, where the philosophical aspects of humanity take precedence in architectural design, rejects the pre-established physical functional standards.

STUDIO PROJECTS

The first project I would like to share with you is a transdisciplinary study of psychology and architecture conducted by B-Arch student Humna Syed under my supervision. She is investigating the psychological disorder "self-deception" related to age and physical appearance. It attempts to tell the story of a fictional character, a bachelorette-aged painter who paints mirrors in a traumatized situation of self-deception. The protagonist has a special relationship with spatial conditions. After long brainstorming sessions and discussions, she narrates:

“Time has become stagnant for her! She dressed up to the nines early morning everyday and spending hours and hours while watching her self in front of mirror, a never ending wait for someone prince of dreams. The deceptive mirror never portrayed her in wrinkled face full of marks of measles and silver hairs but as a young beauty, which was never being a part of her. She always believed to her mother who always told her that she was the most beautiful princess in this world. The story was never ended there as mirror always lying and pushed her back in dreams that were buried in dust of time long ago and shared untold stories of unknown. The characters of those stories always used to

come out of surface of mirrors and were keep alive in her self-deceptive portrait paintings." After narrates the story, she tries to visualize the narrative and paint its experience.

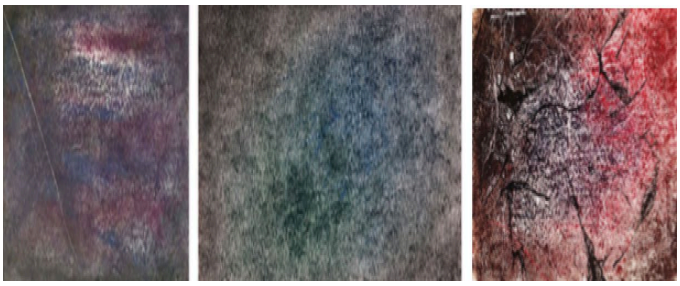

Figure 1. Paintings by Humana Syed

By passing through the text, we can experience the hidden melancholy of the space. By using exaggerated language with poetic expression here, the student creates an emotionally highly charged expression with a tense space. The contrast between the mother's sweet lies and society's harsh truth forces her to isolate and paint herself from both. She paints the experience by using certain hues, textures, and composition of non-representational shapes in an exaggerated manner. These drawings result in a gentle absorption of materiality. Her multi-layered space constructs phenomenal experience. These drawings further lead to a three-dimensional experience of space. At this stage, the narrative of space itself is an informal program.

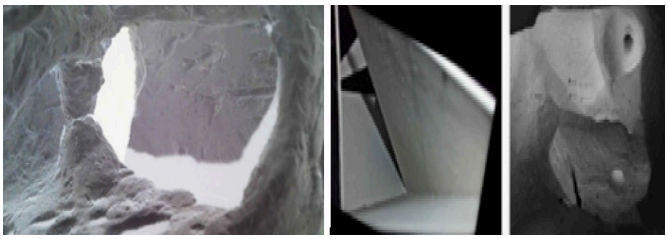

Figure 2. Design and modeling by Humana Syed

Just as in a sculpture or other artistic expressions, the emotional tension of self-deception is induced into a clay object by the modeling process through hands. This object leaves its marks as a void after it is taken as a cast from the plaster mold. The void she has achieved through this method is a non-orienting and scale-less expression of self-deception that requires further work to create a final habitable space. She conducts light experiments with these abstract voids to enhance the experience of self-deception. These experiments lead the process toward a personal studio and exhibition space. It's an unconventional super structure of tapered walls act as roofs also create an alienated ambience. Opposite to proportionate outer form these planes cut up the inner void in such a way that the void is transformed into chaotic lines. These self-intersecting planes, diagonal lines and soft and hard rays of sun create a duality of experience. Without any distinction between roofs and walls and the constant variation of scale and angles vertically and horizontally create an illusionistic space. The intentional instability of the design and the self-contradictory atmosphere of the space dominate the noise in the stillness. The trapezoidal surfaces have a dual function, as the layering of dark mirrors on the interior surfaces transforms these surfaces into canvases. All these factors - fictionality, functionality, and materiality unanimously form the ambience of the space.

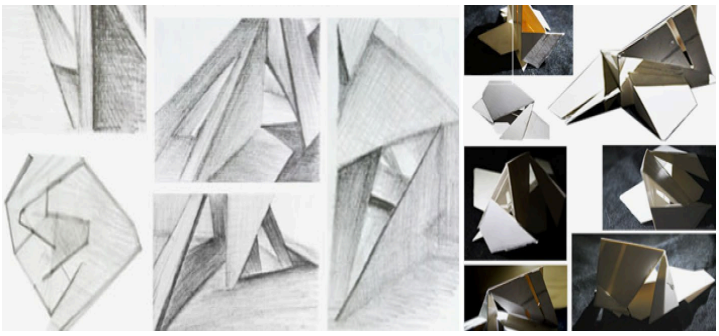

Figure 3. Sketches by Student Humana Syed

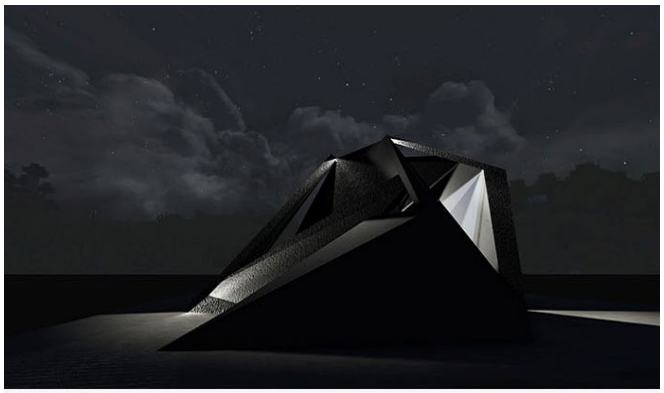

Figure 4. Rendered images and photo graphs of card board model by Humana Syed

Second project, is also transdisciplinary study of psychology an attempt by my student Mahwish Khalil, with which she tries to process the terrible memory of the war to explore the possible impacts of war on psychology of a person and than further its spatial settings. Entitled "Noise of Silence," she develops a narrative in which she explores the possible relationship of inner silence with architecural space. She narrates a fictional character based on the brutality of the war. The protagonist is a mother who has five sons, the youngest is 3 years old. One night, soldiers of occupied forces come to her house and demand to sacrifice of one child of her own choice and if she refuses, they will take them all andb kill. This was the punishment that no mother ever wanted to endure. Even though she was aware of the consequences and horror that awaited him in the concentration camps. She put her trembling finger on the middle boy, as he no longer allive any more. The questioning eyes were that of the boy who saw the ice cold in his mother's eyes when he was taken away. The silence in the boy's eyes that the mother saw when the soldiers dragged him away is a catastrophe and at the same time becomes the agony of life for the mother. She lives every day in solidarity, a much worse confinement than death. “

No one was there…….. ! “Each year on the night of separation, silence starts prevailing drop by drop in barren heart of unfortunate mother. She found her self in unknown non-linear space, deep inside the curst of eath, trapped in never-ending walkways look like a never-ending maze. No one but a familiar resonance of little laugh following as someone is whispering her a joy full call of mama ma……! Full of life and than all of sudden a deep silent pause……like some one is playing hide and seek with her. In course of following the traces of memory of fifth son, she always faces the never-ending alleys but what could she do?”

By constructing this narrative, student draft the basic structure of futuristic space. It is an exaggerated protest against the barbaric inhuman act to which the countless mothers are subjected on the stage of the cruel apathy of humanity. By using poetic language and exaggerations, we make this idea

prejudiced that it continues this dialogue into the next phase of the image for a visual maturity of the silence of pain.

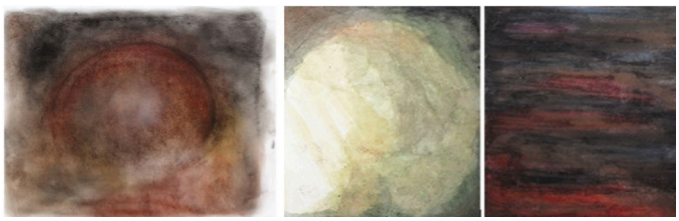

Figure 5. Paintings by Mahwish Khalil

With these paintings, the student attempts to capture the possible pain of a mother's guilt in a hopeless situation. Here, a space has been created out of nothing, which gradually unfolds with emotional state of the mother. It leads the design to a dream journey in which the mother chases the illusions of her separated son. After these paintings, the student begins experiments with clay and plaster and trying to transfer the emotional state of mind we get from the text and paintings into the modeled form. By using molding casting method, we use this modeled form as a cast to attain the mold of plaster that further act like a container. The modeled object induces its anxiety into interior of plaster mold.

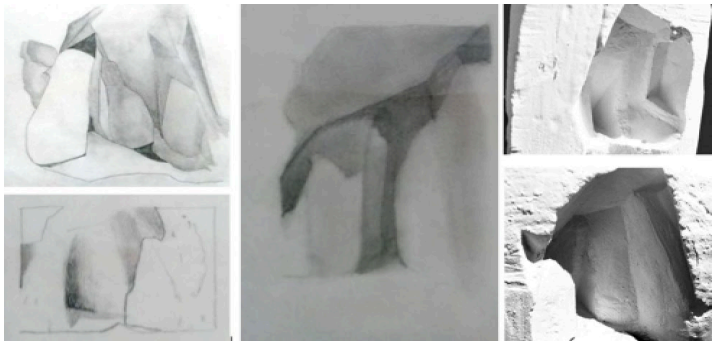

Figure 6. Design and Drawing by Mahwish Khalil

The casted out model leaves its mark on the inner walls of the container and the way the light enters this void having echo of lonely mother and child. It is an unstable space that hovers between the horror of the past and the longing for the erosion of the past in the present, transforming step by step with the emotions and the memories of the boy.

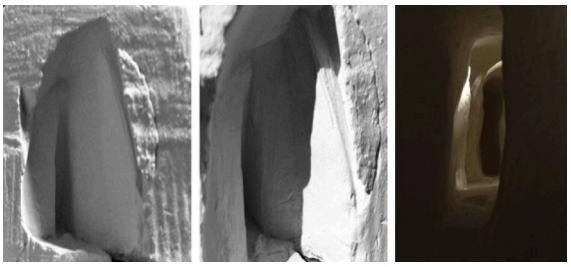

Figure7. Imaginative Alleys designed by Mahwish Khalil

CONCLUSION

Today, architectural field is not limited with in the building related studies only but is evolving into different subfields. The flux of futuristic building technologies, historical, cultural and economic factors lead to a push and pull situation in the study of architectural design. Sometimes designers become so devoted to solving these issues that they ignore the direct relation of a person with its spatial environment. Designs start acting like machines or sometimes become an exhibition of historic social issue. Traditional approaches to resolving these issues will no longer suffice. In this perspective, the transdisciplinary studies can play an important role in training futuristic architects to be able to address these issues and understand the different fields and their possible relationship with architecture. Various approaches can be adopted to explore design through transdisciplinary studies. However, the ability to integrate these expositions according to the intellectual needs of man makes the narratives vulnerable for transdisciplinary study in architecture.

NOTES

[1.]"Towards Artificial Intelligence in architecture: How machine learning can change the way we approach design," Foster + Partners, Google, accessed on May 3rd, 2021, https://www.fosterandpartners.com/plus/towards-artificial-intelligence-in-architecture/.
[2.] Alberto Perez-Gomez, *Attunement: Architectural Meaning after the Crisis of Modern Science* (Massachusetts: MIT Press, 2016), 165.
[3]. Italo Calvino, *Invisible cities* (California: Harcourt Brace Jovanovich, 1978).
[4.] Nigel Coates, *Narrative Architecture: Architectural Design Primers Series* (John Wiley & Sons, 2012). P.62
[5.] Klaske Havik, *Urban literacy: Reading and Writing Architecture*. (Rotterdam: nai010, 2015).
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[10.]"The blazing sun: The tea cup architecture," An American abroad, Google, accessed Jan 10, 2022, https://theblazing.blogspot.com/2011/10/teacup-architecture.html
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[12.] Mark Linder, Nothing Less than Literal: Architecture after Minimalism (The MIT press, 23, 2007). P.24
[13.] Juhani Pallasmaa, The Thinking Hand: Existential and Embodied Wisdom in Architecture (Wiley; 2009). P74

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A CENTRALISED FRAMEWORK FOR REMOTE LEARNING DURING COVID-19 SCHOOL CLOSURES: THE CHALLENGES FOR UGANDAN RURAL STUDENTS

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INTRODUCTION

Prior to school closure, students were taught for 36 weeks in three terms in a year, each term lasting 12 weeks. Secondary schools in Uganda have been closed now for more than 20 months, making Uganda the country that has closed schools longest in the world trailed by Nepal (74 weeks), Bolivia (73 weeks) and India (73 weeks). However, learners in Primary One to Three and learners in Secondary level One and Two have spent two years without attending a physical school since 20th March 2020. Following the Ugandan Government mandated school closures, up to the time of writing this paper, it has implemented a centre-to-periphery approach to learning for secondary schools. There was staggered and phased school reopening for senior four (grade 11) and senior six (grade 13) students to sit national examinations and then closed when they were completed. Other students have experienced the centrally administered remote learning programme to minimise the loss of learning while schools are closed.

Uganda is a landlocked country in the eastern part of Africa. It shares borders with South Sudan in the north, Kenya in the east, Tanzania in the south, Rwanda in the southwest, and Democratic Republic of Congo in the west. Uganda's population is predominantly rural with an average growth rate of 2.7% for the period between 2008 to 2018, although the proportion of rural population has decreased from 81% to 76% over this period.[1]

Parents' literacy and income in rural areas are low.[2] In 2018 Uganda's adult literacy rate, defined as one's ability to read with understanding and to write a simple sentence meaningfully in any language, was 76.5 %.[3] Literacy rates for residents in urban areas was 18 percentage points higher than for their rural counterparts (87% and 69%, respectively). Furthermore, variations in literacy level by sub-region show that, females and males in the Kampala (92% and 93%), Central I (87% and 90%) and Central II (82% and 86%) respectively; were more likely to be literate than those in other sub-regions. (Uganda Bureau of Statistics, 2018). The above situation is further appalling with the low digital literacy levels by teachers and students in Uganda.[4]

To promote the Government's model of remote learning, electricity is essential for the technologies used. However, access to electricity in Uganda is low with availability as a % of population growing for the period between 2015 to 2019 from 18.5% to 41.3% and not all locations have equal access. In 2019, access to electricity, urban (% of urban population) was 70.8% while access to electricity, rural (% of rural population) was 31.8%.[5] In communities with electricity connectivity, it is mostly connected in homes of affluent members within the community, in commercial buildings within the local towns and public places such as hospitals, churches or schools. Electricity providers cannot

afford to wire rural areas and if they do, they cannot wire homes for the low-income families because the providers cannot get enough return on investment.[6] In addition, electricity is unreliable and characterised by regular loadshedding or power blackouts. In short, structural differences mean that not all Ugandans have equal access to electricity which is essential for the model of schooling implemented during the covid19 pandemic. The Government's model of delivery is dependent on access to several instruments.

First, radio is predominantly accessible technology in Uganda. The National IT survey 2017/2018 found that 65.3 % of Ugandan households owned a radio. The privately owned radio stations are spread all over the country and even most districts have at least two radio stations. People especially in rural areas listen to the radio and it has been used for different educational purposes, e.g., in the fight against the 1990's HIV epidemic and increasingly to deliver different national programmes. The radio's ubiquity ensures that cultural, social, and practical knowledge of the target population can be embedded into program design. This can be exploited to adapt the curriculum to a diverse set of mother tongues and allow broad participation.

Second there is low TV access in Uganda. The Uganda National Household Survey 2016/17 found that 21.8% owned a television set, but there were great variations in television ownership across regions: 42% of households in Kampala; 3% of households in Kigezi; 2% of households Teso, Bukedi and Acholi, and 1% of households in West Nile owned a television set.

Third there is significantly low access to computer at individual homes in Uganda. The Uganda National Household Survey 2016/17 reported 5.9% had access to a home computer. It is likely that the reporting of aggregated data rather than separating by urban/rural hides low ownership of computers in rural households since the wealthiest households live in urban areas.

Fourth, one in ten families have access to a household phone in Uganda. The Uganda National Household Survey 2016/17 found that 10.8% of households owned a household telephone, and overall, 70.9% of all individuals owned a mobile phone, and of this only 16 % owned a smartphone. However, these numbers are reflective of the entire population and do not take into account the differences between urban and rural areas.

Fifth, a tenth of Uganda's population have internet access. The Uganda National Household Survey 2016/17 found that 10.8% of all households had at least one member who had Internet access. It is likely that children from urban areas and the wealthiest households have much higher access to internet. According to,[7] internet penetration in Uganda was 39.3% which was below Africa's total use of internet (43.0%) and the global total of (64.2%). However, there was 26.2.% internet penetration in Uganda compared to 59.5% global internet use.[8] Of the households with internet access, 99.1% used their mobile phones to access the Internet.[9] Of the households with internet access, it remains difficult to access high-speed internet; in 2017 (the latest available data), Uganda had 2353 kilobits per second of internet speed which was lower than 27 African countries.[10]

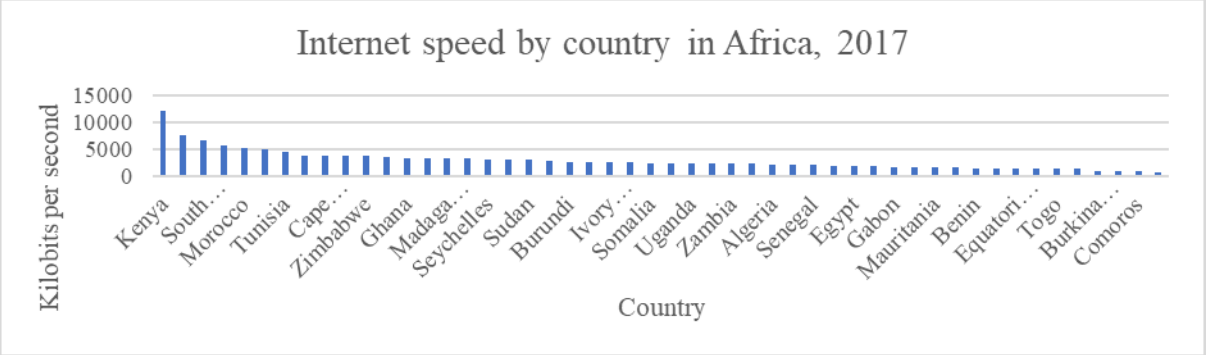

Figure 1. Internet connection is measured by the average speed of data transfer rates experienced by end-users.

In the context of the low access to electricity needed to power technologies for remote learning and low access to different modes of technology such as internet, computer and phones, Uganda like most other low income countries adopted from EdTech [11] the use of radio, TV and printed hard copy study materials. Similarly, like most African countries,[12] Uganda, adopted a national mobilisation involving the use of available technologies (radio, TV, print, hard-copy; electronic but synchronous) but not the online delivery systems in many technologically advanced countries (usually non-African countries). The technologically advanced countries have greater access and opportunities to use technology such as online resources, educational portals, YouTube, virtual classroom/ videoconferencing/ digital teaching, social media and the family structures/homes can generally allow for schooling in non-school contexts, i.e., the home.[13]

This paper focuses on the (in) appropriateness of using a national framework for remote learning during school closures, a situation in which the assumptions of the framework were not based on on-ground realities of both students and families. Specifically, the presentation attempts to examine the assumptions of the framework and establish whether or not they are actionable considering on-ground realities of rural contexts in Uganda.

Ugandan Framework for Remote Learning during Covid-19 School Closure

In contrast to remote learning led by individual schools in most technologically advanced countries, Uganda adopted what might be described as a "one size fit all" (defined as a practice that would fit in all instances) remote learning using centre-periphery decision making process (defined as the structural relationship between the Ministry of Education "centre" and individual school at the local level "periphery" within the country). In contrast to the deployment of online learning systems such as tailored learning management systems and video conferencing that was adopted by most middle- and high-income countries, Uganda, like other low income countries, adopted broadcast media including radio, TV and print materials.[14] The framework included the central government (a) developing standardised study lesson packages in core subjects for secondary schools, (b) distributing these study lesson packages to all learners, (c) nominating and using model teachers selected from districts to teach on radio and television stations across the country, and (d) uploading pre-recorded lessons online for students to download on their phones.[15] Local school headteachers and teachers were either (i) to provide feedback to local district leaders regarding the standardised materials developed by the central government and lessons taught by model teachers, or, (ii) made redundant or stood down.[16] The framework was premised on the goal to ensure no child was left behind due to social and economic status, geographical location and disability status. This chapter focuses on inclusive and equitable provision to children across geographical locations.

Standardised study lesson packages

The Ugandan Ministry of Education developed materials focused on basic concepts, learning competencies and skills rather than content coverage.[17] The framework suggested active learning to enable learners to understand ideas, apply knowledge to new situations and use novel examples to explain a concept. A learner-centred approach was emphasised to accommodate each learner's interests, abilities and learning styles and to foster learner's active participation in discovery learning processes. Problem-based learning and case studies approach were adopted to enable learners to formulate questions, analyse evidence, connect evidence to pre-existing theories, derive conclusions and reflect on learning based on the problem or scenario provided. Experiential learning was adopted to allow learners engage in authentic learning activities that replicate situations or problems they might encounter in real life or in a work situation.

Lesson delivery

Four strategies were developed to ensure continued learning, that is, self-study print materials, use of model teachers on radio and TV and online uploads of pre-recorded lessons as described below.

The print and self-study home packages

The interactive print and self-study materials to help learners study on their own (with support from parents/guardians or elder siblings) while they are at home. Similar to home-schooling practice, this strategy assumed that (a) parents are available at home to support their children learning, (b) parents are able to participate in children learning and therefore the framework outlines roles of parents to ensure successful learning: (i) monitor and guide the learner's learning process, (ii) provide materials that children need for learning, (iii) support learners where necessary.

Radio live recorded lessons

As a replacement for regular teachers for learners in each school, model teachers were selected from districts to teach on radio. The regular teachers and school headteachers were asked to listen to the radio presentation and provide feedback on lessons taught to District Inspector of Schools by sending phone messages or email reports.

Television live lesson presentations learning

As an alternative to regular teachers for learners in each school, model teachers were selected from districts to teach on free-to-air TV. The regular teachers and school headteachers were asked to watch the TV presentation and provide feedback on lessons taught to District Inspector of Schools by phone or email.

Online uploads of pre-recorded lessons

Instead of using individual school's websites, the Ministry of Education uploaded on its website all the standardised study lesson packages in the core subjects listed in the next section. Parents were encouraged to download the materials for their children to study at home. The cost of and access to printing services was presumed to be affordable by rural, typically poor, families. Recordings or click-through presentations reinforce passive learning. Making recordings available saw a decline in attendance of the live sessions, with students not keeping up to date, believing that they could re-watch the recordings. This led to 'binge studying', a tactic that students use to study what needs to be learned all at one time and then be done with it.[18]

GAPS IN AND CHALLENGES OF THE FRAMEWORK

The framework differed from the conventional in-school practice in several ways described below.

Curriculum narrowing: At lower secondary (senior one to four) seven core subjects of: English, Mathematics, Biology, Chemistry, Physics, History and Political Education, and Geography were considered. At upper secondary level (senior five and six), three core subjects of: ICT, General Paper and sub- mathematics and eight elective subjects of: Mathematics, Biology, Chemistry, Physics, History and Political Education, and Geography, Entrepreneurship, and Economics were considered.[19] In this approach more than nine elective subjects were excluded from both lower and upper secondary the remote learning curriculum. The students whose major subjects were left out were unable to continue learning in these areas.

Teacher redundancy and disengagement: The framework disengaged regular teachers and school headteachers from participation in remote learning by (a) selecting a model teacher per subject to teach on radio and TV, and (b) using District Inspectors of Schools to implement remote learning rather than headteachers. Teachers for core subjects that were included in remote learning were

therefore disconnected from students because of this policy change. Teachers for elective subject choices were made redundant because the framework excluded these curriculum areas. In this implementation, teachers on government payroll continued drawing salary without working whereas teachers on school payroll were stood down without salary.

Reduced subject instructional time: Education outcomes are directly impacted by the amount of instructional time that is available and by the quality of instruction during this time. Almost all countries have statutory or regulatory requirements regarding the number of hours of instruction that must be delivered in an academic year.[20] These are most often stipulated as the minimum number of hours of instruction a school must offer. Matching resources with students' needs and making optimal use of time are central objectives of sound education policy. In the Ugandan context an allocation of two hours per day on radio or television for all the levels for six days a week was provided. This translated into 12 hours per week for all the classes (48 hours for one month). On average, a lesson for upper primary and secondary level was not more than one hour. However, prior to covid school closures the conventional subject/lesson instructional time per week was four hours. This meant that subject instructional time was reduced to a quarter of the normal in-school practice. Similar school learning time loss has been documented globally and it is likely to impact on the achievement of the 2030 Sustainable Development Goal 4.[21]

Standardised study lessons ignored the context of rural and remote education: place-based education and cultural diversity was ignored. Students and families living in rural Uganda have specific needs which are the direct result of living in a particular geographical location. There is a high degree of variability in the characteristics of rural areas both within and between districts. therefore, the one-size fits all framework ignores these differences.

Resourcing challenges, especially facilities (ICT infrastructure): Some students without reliable internet access and/or technology struggle to participate in digital learning; this gap is seen across districts and between income brackets within districts. In short, there is a significant digital divide between those from privileged and disadvantaged backgrounds. Affluent parents hired private teachers and were able to purchase printed materials for the children to learn from their homes. In spite of the variety of resources in the framework to provide education continuity, a significant percentage of students was unable to access the curriculum during the period when they could not attend schools.

International literature argues that effectiveness of online learning varies amongst age groups.[22] The general consensus on children's learning, especially younger ones, is that a structured environment is required, because early learners are more easily distracted.[23] To get the full benefit of online learning, there needs to be a concerted effort to provide this structure and go beyond replicating a physical class/lecture through video capabilities and instead, using a range of collaboration tools and engagement methods that promote inclusion, personalization and intelligence.[24]

Mental health and well-being of students during school closures

There are number of important issues arising in this area post-covid19 including:

Teenage pregnancies and early marriages: The school system's systemic formal and informal education shields/protects children from some societal ills and elements who prey on unsuspecting and impressionable young people.[25] It also protects them from themselves and it has been argued that keeping children in school provides a safe space that helps minimise early marriage and teenage pregnancies. As described in the mass media, schools are a sanctuary for learners and it keeps them busy and preoccupied. [26]

Limited access to basic needs and child labour: The economic impact of the Covid-19 pandemic on family income where there was no government assistance combined with school closures meant many

children were forced into exploitative work situations. Many children had no choice but to work to help their families survive .[27]

Violence against children: reports are emerging of familial stresses during the covid19 pandemic resulting in violence, including serious sexual abuse, against children.[28]

CONCLUSION

The Ugandan government during the covid19 pandemic used the technologies that were available to reach a 'mass audience'. This was a good policy choice, but the implementation showed there were challenges that were not clearly identified prior to the action. The provision of materials by themselves was better than no access to the curriculum; however, to have deep learning take place the parent/guardian was no 'replacement' for the teachers as (i) the content was often simply repeated on the tv/radio/in printed form and often the families did not have access to all of the media/content; (ii) parents were often less educated than the student learner, (iii) there was the process of 'curriculum enactment', i.e., teaching, that involves pedagogical content knowledge, and parents/guardians typically could not make this shift from the curriculum to a meaningful set of learning experiences for the learner, (iv) parents/guardians of secondary school students were not educated across the whole curriculum and so some areas (e.g., the sciences, maths, etc.) were not covered. This made it problematic for those curricula where sequential development of knowledge/skills is essential (e.g., higher level maths, such as quadratic equations/calculus/ etc., as it depends on earlier material that parents could not teach.

The disruption to student learning has had negative societal/family consequences including the requirement of the children to earn an 'income', and personal consequences, e.g., pregnancy, unemployment, anti-social behaviour. In the longer term there will be national consequences if this cohort of students do not achieve their potential. To address the loss of academic learning time during the pandemic a positive strategy would be to increase both the length of the school year and the length of the school day and concurrently implement a remedial programme with designated tutors to help students cover the essential curricula. As the MoE has developed a policy to deal with extended school closure they should continue to improve the quality and opportunity for online/blended or hybrid learning and use it as a supplement for in-class teaching particularly for rural students.

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ENCOUNTERS WITH THRESHOLD CONCEPTS THAT FACILTATE TRANSFORMATIVE LEARNING PEDAGOGY

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INTRODUCTION

Students new to design studio courses frequently encounter exercises that present issues difficult for them to understand and onerous to act on. In the muddled confusion that is the companion of lack of comprehension, beginning students resort to reliance on their limited past experience and preconceptions, will act frivolously or in a rote manner, or worse, they try to 'fake it till they make it.' These responses construct barriers to understanding. Many of these postures toward initial efforts in design courses are due to an attempt to operate in pedagogical structure outside or beyond their developmental level as a learner. Many students are not only not ready for design education, they are also unprepared to engage creative thinking. This results in challenges to learning design that I believe need to be more recognized by beginning design pedagogy. Traditional beginning design pedagogies that are presented as mere 'skills courses' or seek principally to foster entry into the disciplinary knowledge base often do so with limited intent to develop student aptitude toward designing. Instead, beginning design pedagogy that presents exercises to more explicitly confront these issues as threshold concepts will better address the developmental nature of early design exercises on student transformation as learners.

Those moments that beginning students find challenging to understand can be defined as encounters with thresholds concepts within the pathway of learning. Experiencing a threshold concept will fundamentally alter the way a discipline is viewed, and in this way, do not focus on acquisition of skills but instead will transform the life-experience of the student. Building encounters with threshold concepts into beginning design pedagogy appropriately realizes that confronting threshold concepts is necessary to learning design. This is because beginning design pedagogy focused on achieving threshold concepts better facilitates the transformative learning necessary to realizing one's self on the path to becoming a creative designer. In this author's view, an intentional and mindful incorporation of threshold concepts into the curriculum and pedagogy of beginning design education will not only accelerate design learning but will place the student more quickly onto a path of self-determination as a learner, where they will more purposefully adopt the ability for 'learning how to learn' that defines a mature designer. Toward that end, it is the purpose of this paper to identify thresholds concepts in design learning experiences toward furthering research on this topic. Although not all inclusive, significant threshold concepts will be defined in the context of typical beginning design experiences.

WHAT IS A THRESHOLD CONCEPT?

Learning design involves a developmental transformation of the learner, especially with respect to confounding encounters within learning. For beginning design students, making Informed decisions within their design exercises requires development of an awareness of the source and context of their values, feelings, and knowledge within a context that enables testing and critical reflection of the validity of these assumptions as fundamental to their development as learners.

Transformative learning refers to the process by which we transform our taken for granted frames of reference (meaning perspectives, habits of mind, mind-sets) to make them more inclusive, discriminating, open, emotionally capable of change, and reflective so that they may generate beliefs and opinions that will prove more true or justified to guide action.[1]

The necessity for these transformations in the beginning design student is evident in the frequent reliance on pre-conceptions in early design exercises. Transformative learning occurs when students become critically aware of their own tacit assumptions amid those of others, usually within active discourse when assessing the relevance of an interpretation, effecting a self-adjustment of habits of mind and perspectives.[2] Transformative learning occurs in an acknowledgement that pre-conceptions must metamorphize in order to become useful in design thinking. This kind of transformation in the learner can be characterized as an encounter with a threshold concept. As characterized by Michael Tovey,

The threshold concept theory posits the idea that within disciplines there are conceptual gateways or portals, which – due to their troublesome nature – can make it difficult for students to progress. This notion of a threshold concept is seen as distinct from 'core concepts' – or building blocks – within disciplines, as it engages with the notion of transformation. Grasping, experiencing and understanding a threshold concept will irrevocably transform a student's understanding, and this transformation can relate to the particular subject at hand, and or be extrapolated beyond the academy.[3]

There are many such threshold concepts encountered as students learn to design in their initial design studios, within confrontations encountered that are normal to design learning in the form of drawing, modeling, and design operations, especially when creative and/or conceptual design thinking is initially becoming active.

As developed by Meyer and Land, a threshold concepts within the experience of learning is "considered as akin to a portal , opening up a new and previously inaccessible way of thinking about something. It represents a transformed way of understanding, or interpreting, or viewing something without which the learner cannot progress."[4] Not only is the learning transformed by a threshold concept, the learner is also fundamentally transformed by the experience. Characteristics of a threshold concepts occur as a multiplicity across learning experiences but are not necessarily the core concepts of a discipline, but those that have a propensity to be transformative of both the processes of learning and of the student him/herself. A primary characteristic of threshold concepts is that they are irreversible, in that once one has understood them it becomes impossible to return to the previous view of the world. It is also likely that a threshold concepts will be troublesome encounters, in that there is difficulty in understanding them, or to the student they seem alien, counter-intuitive, or even incoherent.[5]

A central characteristic of a threshold concept is that emerges as troublesome when students are tasked to engage design exercises on their own, as a designer, without being tethered to an instructor who, in the student view, 'holds the answers' to the design problem at hand. A suitable beginning design exercise will place the student intentionally within troublesome situations, while not attaining the "wickedness' characteristic of a mature design problem.[6] In experiencing the troublesome nature of a threshold concept, a student may appear to be 'stuck' and may often mimic an understanding before crossing the threshold. Additionally, a student grappling with a threshold concept may also enter into a broadening of a discursive use of language to engage and communicate new thinking and

reflections on that thinking. However, even though threshold concepts are not explicitly disciplinary in nature, once they are fully engaged, threshold concepts tend to lend comprehension to the whole of a discipline and may even define disciplinary limits.[7] Most importantly, by grasping threshold concepts individuals engage the ability 'to become'. Understanding moves to being. Encountering threshold concepts are part of the formation of a path to a reflective practice of designing, however, threshold concepts give rise to a transformation of life-experience beyond reflective mindfulness. Moving through the portal of a threshold concept, knowledge structures that underlie the act of design within a specific discipline become part of the developing being of the person.

It is the author's intent to identify and elaborate some significant individual threshold concepts common to beginning design education as an initial investigation into their role in the transformation of design students. Each threshold concept will be developed in terms of how it manifests as troublesome for beginning design students, and identify some primary causes that bring it about. Threshold concepts are presented in no particular order, although some may precede others, dependent on curriculum and pedagogy.

Threshold of Uncertainty

Uncertainty as a threshold of learning in beginning design education has received some study, particularly as manifest in the education of the product design discipline. This study is applicable across design disciplines. Beginning design students frequently lack prior experience with creative practices and thereby exhibit a lack of creative confidence in the immediate encounter with the many variables related and unrelated to a design problem, thus revealing great uncertainties about how to proceed, and creating associated anxieties that unearth insecurities about moving forward. Learning to recognize that encountering uncertainties is normal to the design process and learning to tolerate this condition is a first step. Construing uncertainty as a threshold concept, however, happens, "the moment when a student recognizes that the uncertainty present when approaching a design brief is an essential, but at the same time routine, part of the design process."[8]

Developing the toleration for design uncertainty as a threshold concept moves the student toward developing core capabilities of creative design thinking. It is transformative when design students recognize that developing tolerance for uncertainty is a spring-board to innovation in design. This represents a transformative shift is student confidence which is irreversible. Encountering and moving through the threshold of uncertainty enables a realization that much that is experienced, even that which is not related to task, may inevitably contribute significantly to the process of design. This will also enable students to realize they will continually experience the search through seemingly superficial variables as they seek a proposal that addresses the design problem.[9] This is one of the core attributes of design processes that, when repeatedly experienced, give rise to the student being able to begin frame the design act for themselves, an act a self-development critical to becoming more mature as a designer.

Threshold of Abstraction

Abstraction is a central issue of beginning architectural education because coming to terms with abstraction is an early demand of learning design, with the intention that students learn new modes of abstract representation as instruments of design process, to see and visualize the world through abstraction, to think through abstraction, and use it to communicate an imagined architecture.[10] However, design exercises that ask the beginning student to immediately manipulate design operations abstractly is frequently taken-for-granted in beginning design education. An example is the use of 'form,' which is abstracted from the physical world as a reduction of architecture. Likewise, conventional orthographic drawings and scale models are developed from processes of abstract representation that can mislead and distort experience.[11]

The beginning design student is not only not ready for abstraction, they do not understand abstraction's mechanisms of transformation, nor how abstractions become active within design processes they are only just beginning to comprehend. Abstracting is a progressive transformation away from any concrete actuality as if drawn out of the concrete world as a continuum from the particular and sensorial to the general and even symbolic.[12] Unless a student is looking for this displacement, they will struggle and become lost to the design process. Because students new to design have largely unreflective lived-experiences and little conception of design process, encountering abstraction as part of design thinking can disruptively troublesome and malign the learning of design processes. Abstractions stand for other things, ideas, or perceptions, and reduced abstractions like form can create distance that reduces experience to thought, far from the fullness of experience that leads to personal meaning in experience. Abstraction instead confounds those conceptions that might otherwise be drawn out of the experience of the world, leaving in its place only an ungrounded abstraction. Design exercises that reduce architecture to abstractions disengaged from embodied experience can defamiliarize the world and cause prior experience to be viewed as of little value. Encountering abstraction also conflicts with each student's previously known, comfortable, yet uninspected way of seeing the world that, instead of giving clarity, tends to be experienced as a confusing and troublesome.

Encounters with abstraction act as a threshold concept in design learning, that poorly addressed, are out of step with the transformative journey of student self-development that spurs development of cognitive abilities necessary to design education. Learning to use abstraction as an instrument of design is one of the most important threshold concept encounters in early design learning as students must first learn about abstraction and its operation as part of the generative design processes of design bound into design processes, active as a reduction, simplification, and in the language of design, conceptualization. To use abstraction as a transformative device within early design education is to enable a design student to recognize its distancing effect from both physical reality and actual experience, and thereby the meaning of engagement in living experience. Engaging the threshold of abstraction will transform design learning within comprehension that abstracting the world opens up new interpretations, possibilities, and range of content engagement.

Threshold of Indefiniteness

A strong correlate of the experience of uncertainty in beginning design is the experience of indefiniteness. A design exercise or project brief appropriate to raising thresholds of learning will intentionally contain just the right amount of vagueness that constructs indefiniteness of conceptual direction and lack of clarity of how to begin, or even how to parse out the issues to be addressed. That beginning design students bring preconceptions and misconceptions about architectural design with them into beginning design experiences is an emergent pre-condition all design instructors can verify. When dealing with a design brief that presents unfamiliar conditions or when conceptually stymied within design processes, beginning design students find themselves at a loss for how to proceed and will readily rely upon experiences and perspectives formed prior to engaging design education. They will willingly fool themselves into believing misconceptions or rely on their preconceptions simply because it's the only direction they summon. If they instead can be honest with themselves about not knowing what to do, a state of 'not-knowing' will be realized that, once accepted, can free the mind from pre-conditions and unconnected assumptions. Being honest with oneself about not knowing what to do is requisite to revealing the broad possibilities that underlie creative thought. Not knowing is a precondition of creativity.

It is an uninspected norm of beginning design students to depend what is known instead of what is not known. However, not knowing is to be celebrated because the need for creativity depends upon indefinite circumstances. If solutions are known, there is no need for any creative design approach.

Many students exhibit a fear of not knowing that hinders process. They must come to realize that design is not black and white and is instead the grey area between concept and reality, a realization that causes consternation with the fact that there is process.
Not-knowing is the root condition for design. The realization of not-knowing is a personal breakthrough that preconceptions about design are insufficient and need to be transformed within conceptualizations that can begin to impart a trajectory in the work of process. This is the moment that a student engaging in design can perceive for themselves the need to transform from a fixed mindset to a growth mindset in a commitment to process.[13]

Threshold of Conceptualization

An issue always contentious for beginning design students is conceptualization, typically framed around the notion of: what is an architectural concept? Coming to an understanding that the experienced physical world gives evidence of ideas – that there are ideas in things - is often baffling to students and contradicts their lived-experience, especially on reflection in the context of a design exercise. The definition of the term "concept" becomes a primary issue. 'Having an idea' or direction for a project is frequently disassociated from what students believe they know to already exist. An immediate impression maintained by students is that a concept is an idea and they just occur with a bit of thought or they can wait until a proverbial light bulb comes on. Another preconception is that architectural concepts, once attained, should result in actionable design directives. Also, problematic and sometimes distressing aspect of the threshold of conceptualization, is the realization that 'having a concept' does not necessarily provide direction for decision-making. However, once this becomes accepted as normal to design processes, it becomes understood that continued effort on design development does not depend on a need to 'know' because it can now be comprehended that succinctly characterizing a 'concept' can coalesce later in process engagement.
A primary companion of conceptualization is curiosity. Curiosity is an engagement in a willingness to discover and learn, amid the raising of questions. Curiosity is the valuing of raising questions without knowing the outcome – the question becomes valuable in-itself, as it leads to other questions and the construction of a network of connections. Engaging curiosity becomes a 'seeking out' where 'Why' precedes 'What' and possibilities are celebrated for their potency. Expanding a range of possibilities that underlie a design problem becomes exciting. This recognition of inquiry often represents the starting point for the content of a design conceptualization. Often it comes about in discourse with others in the design studio and/or in the context of design critique within early design ideation.

Threshold of Systems Thinking

For each student, there comes a moment of realization in design learning when the making of design decisions seems to become somewhat automatic – as if the next decision makes itself easily known. This is in some ways a beginning of the realization of the actions of design as a system of decisions. The important aspect of systems thinking in this moment of realization in feeling that decisions seem automatic is a realization that the systematic structure of decisions is outside of the self. No personal opinion is involved because the system of decisions exists apart from the designer's predilections, preferences, whims, an even the designer's personal experience. Iterative design thinking is a search for systematic relations and doing so allows aspects of the system to reveal themselves. Recognition of systematic processes also reveals a point of view, and at this moment the designer may realize a choice that may focus the conceptualization of the project.

CONCLUSION: THRESHOLD CONCEPTS AND CURRICULUM TRANSFORMATION

Design curriculum is often characterized as an orderly presentation of disciplinary concepts, within an increasing complexity from foundational to discipline specific issues correlated with movement through sequences of courses. However, beginning design curriculum is not just about imparting of categorized disciplinary content areas. Instead, beginning design is foremost about the transformation of student life experience, partially through encounters with thresholds of learning. Threshold concepts are distinct from 'core concepts' of a discipline, as threshold concepts engage with transformations of both learning and the design student while disciplinary concepts do not necessarily do so. There are, of course, many more threshold concepts to be studied than those described in this essay. A non-exhaustive inventory of significant threshold concepts includes those typical to beginning design learning experiences, such as uncertainty, abstraction, systems thinking, conceptualization, and other related issues that address process/iterative thinking, criticism, ideas/concepts, narrative, description, resourcefulness, resistances, design as performance, the role of language and even recognizing the transformation of preconceptions and personal feelings.

Beginning students are novice learners who grow into advanced novices at the second curricular level, but are in no way should be thought to be developing expertise.[14] At the beginning of a design curriculum, curricular concern for student development must be much greater than the conveyance of disciplinary concepts because of the need for learning experiences transform student development amid the opening of ideas that transform student learning, making them more receptive to and mindful of their own design inquiries. For students to encounter, engage, and recognize threshold concepts in design learning realizes the development of the ability to become aware of what is happening to them and recognize their own role in it. This is significant in the design student's early development because it constructs perspective of their part in the whole of design processes. Passing through thresholds of learning in design also transforms world of designed objects and environments in toward construction of the student's agency in their own education as a designer. Engaging threshold concepts in design learning design initiates in the student a self-transformation and acceptance of change in the rising of consciousness within an interrogation of the designed environment that causes a loosening and transformation of the world view constructed in everyday experience prior to design education. A growing awareness of particulars and concepts of the world of objects and acceptance of one's transforming self gradually supplants a worldview borne of a superficial and even symbolic awareness of things. Combined with other threshold learning experiences, there is a growing realization of agency as both a designer and with respect to designed objects and environment. It becomes clear that the professor does not have the answers amid a growing initiative that design inquiry is self-induced and design decision-making is influenced more by factors outside the self than internal motives or the will of the designer.

Realization of intellectual boundaries and recognition of new potentials is part of the educational process inherent in discovering the operative nature of design. Within the educational structure, it may seem a well-reasoned strategy to reduce pedagogy to just the amount of content with which a beginning design student can grapple. However, he basic value of beginning design pedagogy as a foundation of a design curriculum is not to teach students what or how to think, rather it is in teaching them to value thinking through creative processes and that this development is transformative. Moving the emphasis of the content of curriculum from strictly disciplinary concepts to encounters with threshold concepts develops the importance of practical, embodied, and experiential ways of knowing that correlate with learning design as a transformative experience. Enabling students to address threshold concepts in design experiences can lead to pedagogical structures that better facilitate self-development as a designer. Seeking to impart thresholds within pedagogy and assessing the effectiveness of the pedagogy in doing so is also transformative of the instructor.

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FOCUS ON PEDOGOGY: THE TRUTH, FAÇADE, AND SUSTAINING CHALLENGES ONLINE IN JAPANESE EDUCATION

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INTRODUCTION

Unfortunately, the Japanese mandatory inoculation policy ceased in 1994[1], leading to the lack of flexibility to adapt to the 1996 HIV crisis[2] and the 2001 Anthrax world threat.[3] In result, Japan's dependency upon imported vaccines for survival under the 2020 Covid-19 Pandemic became evident. In 27 years of neglect, the Japanese vaccine industry simply withered away as "non-existent" even today. The pandemic havoc spread throughout Japan disrupting the complexity of the social economic structure. The Tokyo Olympics and the Paralympics was postponed but held in 2021.[4] Meanwhile, the games continued leading to a consecutive wave of Covid-19 variants while Pfizer and Moderna vaccine rollout was in progression. In April of 2021, Japan's Ministry of Education, Culture, Sports, Science and Technology ordered all universities and schools to return back to face-to-face education. Compared to the previous year, universities have returned on-line with an innovative flexible stance in the fall session. The Delta variant death rates have significantly decreased down to "zero deaths" on November 8th, 2021.[5] Although universities were ready for the "on-line 2020 adjustable shift" within a week, Japan's secondary educational institutions with their positive adamant egalitarian view of education continued, as "business as usual", for they found it difficult to comply with the technical shift. Japan's tech prepared culture was just a façade within the complexity of reality. This paper will discuss and introduce new true innovative "tech savvy" resilient on-line applications with "educational challenges" that the author faced, in a national university, while using a hybrid stance to assist, support, and sustain the new compliant egalitarian approach for all students including those with hearing impairment conditions under the pandemic.

Keywords: Japan Ministry of Education, Sports, Culture and Tradition (MEXT), Innovative Hearing Impairment Technology, Sustainability, Covid-19 Pandemic Digital Divide & Gap, Innovation in Curriculum Design, Post-Pandemic Challenges, UD TALK, and the Learning Management System (LMS)

The Truth & Façade of Japanese Education: Pre-Pandemic Era

Japanese Education is based upon an egalitarian view referred to as an "Escalator System", which means citizens are expected to be under conformity and uniformity by age to learn, within the same time frame with the same textbooks as the notorious 3,000 word "Genius English-Japanese Dictionary" recognized by the Ministry of Education, Culture, Sports, Science & Technology

(MEXT) to establish Japanese identity. In an obsolete manner, students are expected to homogenously progress in mass-production, without diversity, where no one fails nor jumps to the next level. The egalitarian humanitarian system completely follows the principles of the "Convention on the Rights of Persons with Disabilities" proclaimed by the "Charter of the United Nations" on January 30, 2014:

"(e) Recognizing that disability is an evolving concept and that disability results from the interaction between persons with impairments and attitudinal and environmental barriers that hinders their full and effective participation in society on an equal basis with others."[6]

Japan is very socially conservative with more interest in cultural conservation rather than learning a foreign language that would interfere with the "harmony of conformity". Hence, English education has been systematically fossilized to establish students who learn English to pass MEXT approved examinations. To get a better idea of the philosophy, refer to the following traditional proverb:

"出る杭は打たれる"[7]

Pronounced, *"Deru kui wa utareru."*

Translated by Hirona Matayoshi, *"The stake that sticks out gets hammered down."*

As you can imagine the pandemic caused chaos due to the shift to on-line remote learning operations. Even today, educators are "expected" to return to pre-pandemic business as usual to "spoon-feed" students like a sustainable hammered down structured "samurai sword". Therefore, structural reform in education is extremely difficult when society expects mutual compliance in cooperation to sustain the norm of generations.[8] However, front-line educators diligently continue to find ways to accommodate shifts in education toward better practices which will be introduced in this paper.

Japanese Higher Education Overcoming Challenges

The Japanese education system is connected to the social security system, that is divided in stages (phases) that are based upon age, and the retirement age is 65 years old, with the cut at 75 years old.[9] The Japanese welfare system is one of the best systems in the world, but just like education it is a system with a "domestic goal".

Recently, the United Nations is thankfully pushing equality as a change in STEM and many disciplines in education that influences Japan.[10] Japan was not always an egalitarian society, in fact, it once had an eugenics law that forced sterilization and abortion (1948-1996) violating disability rights to reproduce in the pursue of happiness.[11] Luckily, justice prevailed in court in 2022[12] due to the International Criminal Court and the United Nations ruling and defining it as a crime against humanity (genocide).[13] The Japanese education system had also betrayed future female doctors two years ago, when female applicants were "uniformly" refused admissions based upon gender discrimination in medical school examinations.[14] Again, luckily this year, female medical school applicants all over Japan outperformed the male gender applicants[15] with a vengeance for being hammered down like an "ornament sword" breaking through the façade for the truth.

On the other hand, the last "men's university" was Tokyo Shousen University that merged with Tokyo University of Mercantile Marine and Tokyo University of Fisheries changing its name to Tokyo Kaiyo University (Tokyo University of Marine Science and Technology) while going co-ed in 2003[16] which was only 19 years ago. When we compare the education systems with the International and Japanese schools, we can see the clear difference in goals (domestic vs. international) within education. Japan's group mentality goals are for sustaining the population for the domestic economy, whereas International School goals are for bilingual global survival.

The Japanese Education System Stages (Phases) **Domestic Goals**			
Age	Grade/Degree	Educational Institution	
3-6	Nursery/Kindergarten		Special Education
6-7	1st grade 45 minutes	Elementary School Compulsory Education	
7-8	2 45		
8-9	3 45		
9-10	4 45		
10-11	5 45		
11-12	6 45		
12-13	1st grade 50 minutes (freshmen)	Junior High School	
13-14	2 50 (sophomore)		
14-15	3 50 (senior)		
15-16	1st grade 50 minutes (freshmen)	High School	College of Technology
16-17	2 50 (sophomore)		
17-18	3 50 (senior)		
18-20	Associate A. A	College (2 year)	Community College Vocational School
18-22	Bachelor B. A	University (4 year)	Specialized Higher Education
22-24	Master's M. A	Graduate School	
22-28	Doctor's Ph.D.		
24-25			Medical
25-26			Veterinary
26-27			Dentistry
27-28			Pharmaceutical

Table 1. The Japanese Education System Stages (Phases) [17]

International School Education System Stages (Phases) (US & UK & German Combination) **International Goals**			
Age	Grade/Degree	Educational Institution	
3-5	Preschool/Nursery	Early Foundation Stage Childhood Education UK: Key Stage 1 (Ages: 5-7)	Compulsory Education
5-6	Kindergarten		
6-7	1st grade 60 mins		
7-8	2 60	Elementary School Primary/Lower School UK: Key Stage 2 (Ages 7-11)	
8-9	3 60		
9-10	4 60		
10-11	5 60		
11-12	6 60		
12-13	7 60	Middle School UK: Key Stage 3 (Ages: 11-14) Germany: Orientation Stage (Ages 10-11)	
13-14	8 60		
14-15	9 60 Freshmen	**High School/Secondary School SAT Prep UK: Key Stage 4 (Ages 14-16) GCSE (Exam) German: First Phase (Ages 10-15)**	
15-16	10 60 Sophomore		
16-17	11 60 Junior	**High School (Diploma) SAT (Exam), LSAT, MCAT, GMAT, ACT, TOEFL, IELTS Germany: HZB (Exam) UK: A Levels German: Second Phase (Ages 15-18)**	IB Diploma
17-18	12 60 Senior		
18-22	**Associate A. A**	**College (2-4 years)**	**Higher Education**
18-22	**Bachelor B. A**	**University (4 years)**	
Age varies	**Master's M.A.**	**Graduate School Exams: GRE, GMAT, LSAT, MCAT, TOEFL, IELTS**	
	Doctor's Ph.D.		
Age varies	**Vocational school Adult Education**		

Table 2. International School Education System (Phases)[18]

History of English Vocabulary Words Learned in Japanese Schools			
Year	Junior High School	High School	Total
1951	1,200-2,300	2,100-4,500	3,300-6,800
1958-1960	1,100-1,300	3,600	4,700-4,900
1969-1970	950-1,100	2,400-3,600	3,350-4,700
1977-1978	900-1,050	1,400-1,900	2,300-2,950
1989	1,000	1,900	2,900
1998-1999	900	1,800	2,700
2008-2009	1,200	1,800	3,000

Table 3. History of English Vocabulary in Japan[19]

After Reform 2010: Vocabulary Learned in Japanese Schools Today			
Schools	Vocabulary Goal	Acquired Vocabulary	Types of Vocabulary
Elementary School	500	500	ESL (EFL)
Junior High School	1,000	1,500	EGP
High School	2,000	3,500	
University (Liberal Arts)	1,500	5,000	ESP
University (Specified)	1,500	6,500	
Graduate School	1,500	8,000	

Table 4. 2010 Reform of Vocabulary Words Learned in Japanese Schools[20]

TESOL Comparison Between Japanese Schools and International Schools

In comparison with the four tables above, the English vocabulary that was taught in Japanese schools have significantly decreased over-time. The students of 1951 were more studious and between 1958-1999, the MEXT found a way to cut the vocabulary down to half. Between 2008-2009 there was an increase of vocabulary due to researchers complaining to the MEXT for reform. Referring to Table 4, the vocabulary lists only 500 words in elementary school. Adult English-native speakers acquire approximately more than 30,000 words while in Japan, children learn 500 words by the time that they reach 7th grade, and by the time they graduate from high school they would have acquired between 2,500-3,500 words. Hence, the egalitarian façade prevails and English acquisition in Japanese schools are a rare commodity compared to Table 2 where International School students in Japan are natively bilingual.[21]

Sustaining TESOL in University Education in the Era of the Covid-19 Pandemic

When the Covid-19 Pandemic hit Japan, individually, the private and national universities quickly "maneuvered" operations on-line within one week. Private universities went through a crash course using Google Classroom while national universities like Yokohama National University (YNU) used the Learning Management System (LMS) for on-demand resources in class, while at the same time, learning how to use Zoom for classes as well.

Unfortunately, some teachers were uncomfortable with the digital shift developing into the digital gap resulting in, early retirement representing the façade of the egalitarian society.[22]

Moreover, the students were forced to face the "new digital savvy normality" feeling that they lost their "campus life" leading to complaints which forced the MEXT to return to in-person education in April of 2021.[23] Meanwhile, the spread of the pandemic raged throughout Japan with the Tokyo Olympics and Paralympics games.[24]

Nonetheless, teachers survived with the on-line-in-person hybrid method with a seat arrangement separating students from the instructor protected by the partition surrounding the podium[25] until teachers with underlining medical conditions were "allowed" to return to on-line classes with the wave of the Omicron variant.[26]

New Innovative Savvy Technology for the Hearing Impaired: Evolution

During the pandemic, educators were faced with finding ways to deal with listening disabilities as a duty, by law, with innovation in the egalitarian education.[27] Hence, teachers and professors immediately used the new innovative technology called, "UD Talk" while conducting ZOOM classes.

The UD Talk is a free Apple Store application that makes communication with those with hearing impairments easier through utilizing oral recognition into script or subtitles with a universal automatic simultaneous translation into script as well as vocal communication. Unfortunately, all instructions and manuals are in Japanese at this moment. Please refer to the tutorial on YouTube connected in the footnotes below.[28]

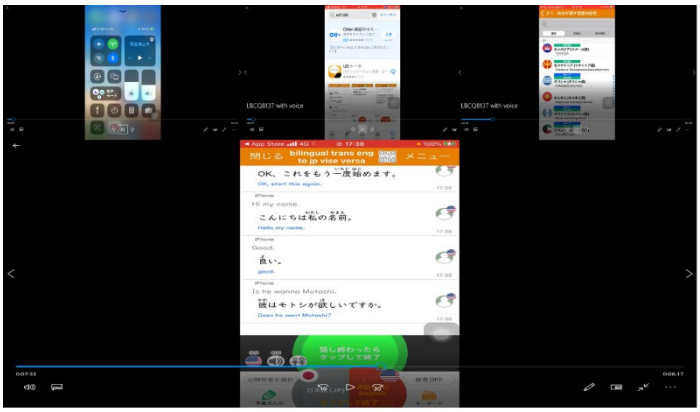

Figure 1. UD TALK Photographed by Hirona Matayoshi

CONCLUSION

The complex reality of the Covid-19 Pandemic provided a shift toward innovation for survival to overcome the façade to face challenges within the gap of obstacles of uncertainty for reform providing more options in fields of discipline and to deal with the inevitable change toward a better diversified future without fossilization in Japan's egalitarian English education.

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AROUND, ABOUT: A TEMPORAL SITE

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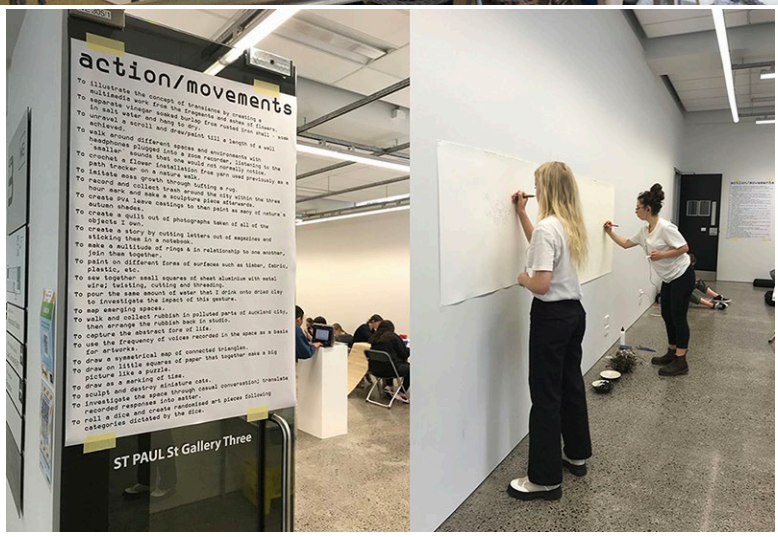
INTRODUCTION

"Around, about" is an invention, a description devised to consider how site can be understood through the concepts of exchange, proximity and temporality and as a central component of socially engaged practices. The Temporary Practices/Temporary Publics Minor curriculum in the School of Art & Design at AUT University forms the pedagogical focus of this discussion, a programme of study developed out of the research interests of Visual Arts, Spatial and Communication Design staff. Our practice-led research works across multiple practice methodologies, which we often frame as "the site of" – taking this to mean: we explore site as a situational field, a way of drawing a perimeter around a set of relations, and a conceptual tactic for re-envisioning site as an "around, about". We (the authors) make artwork in the inter-related fields of socially engaged art, object-making, installation and publication, employing acts of invitation, exchange, participation and reciprocity. These methods and modes of practising make up the field of Temporary Practices.

We will explore three key terms to locate the notion of a temporal site – around-about, when-with, where-with – which will be discussed through the four key frameworks that underpin the Temporary Practices Minor; Site, Participation, Publication and Collaboration. As the papers scaffold throughout the degree, they each situate a mode of practising for the student/the temporary practitioner through studio-based activities. For example, the Year One paper is titled "The Traveller: Site-Related Practices", and the engagement with site is conducted through walking and action/movements.



Figures 1 and 2. Temporary Practices students participating in "The Traveller: Site-Related Practices" one-day residency in 2015 (top), and 2020 (bottom) at ST PAUL St Gallery III, Aotearoa New Zealand

Our pedagogical framework rests upon several key strategies. Temporary Practices is taught as a "co-" (in the verb); we co-teach and co-create the curriculum within a cooperative and collaborative learning environment. As a contributing tactic, we consider the student group (participants and interlocutors) a temporary community formed by way of interactions, exchange and distribution. Thus, the four papers that make up the Minor set the scene through their person modality: The Traveller, The Collaborator, The Distributor, followed by The Event, the culminating Year Three paper where students engage in site relations through participation and act as facilitators, organisers, makers and hosts. By stretching the scope of the project's activity, the students direct the when-with and the where-with of their project through the choices they make regarding site relations. These could be associated with a place-time or time-place, a public, or an exchange. In doing so, the projects produced enact an active bringing-together. For instance, when talking about site in this particular context, the "with" of the when and where is often the public themselves. Their receiving and reception of a work provisionally construct a perimeter "around, about" a given project and what we consider the site-of-exchange and a temporary public.

Figure 3. Temporary Practices students walking up Maungawhau (Mount Eden), a scoria cone – as part of a site visit to participate in a performative artwork by Australian artist Bianca Hester, 2015

Another key tactic and common thread that cuts through all four Minor papers is the utilisation of HOW TO documents and ephemera as teaching material and conceptual know-how resources. The HOW TOs take the form of lists most commonly; our first-ever, HOW TO_A4, positioned for students a list of approaches of how they might utilise the "document'" in recording, documenting and converting an encounter into an artwork.

SITE

The first practice framework, which underpins all actions in the Minor, is "site-related practices". In defining what temporary practices are, we use more conventional notions of site to explore temporary relations and modes of art and design activity, the doing part of practising. The when-with comes into play as the students begin to engage with the around, about of site, the thinking-doing aspect and the literal sites (places and associated histories) while reflecting on what it means to be a traveller and an in-mode temporary practitioner. In "The Traveller: Site-Related Practices", students undertake four walks – one that has a destination, another that focuses on the journeying to-and-fro, and two others that openly interpret site relations through an expanded inquiry into the visit, the intuitive, the guided and the performative. We ask them to consider: What connects you from one site, place or timeframe to another? How can you explore relations between these things via walking as a contemporary approach to site-specific and site-related practices?

This undertaking requires students to make recordings (notations, observances, mark making) that, in effect, become documents. So, a personalised recording kit is assembled that ranges from walk-specific tools, media and materials to equipment and useful hacks. Weekly context talks also act as prompts. For example; Francis Alÿs walks around the outside edge of a suburban park dragging a stick along the metal fencing,[1] Germaine Koh positions a pole in the middle of a well-trodden path to create an alternate route,[2] HOOPLA, Kathy Waghorn and Nina Patel invite the public to join them on a guided walk around local environs and histories,[3] Dillon de Give invites people to gather for a sunset viewing,[4] Ophelia Mikkelson Jones follows men carrying flowers to record their gestures,[5] Janet Lilo walks 80km from city to city for The Normandie research project.[6]

Figure 4. HOOPLA (Kathy Waghorn and Nina Patel), Guided Walks: Avondale Loop Walk, 12 October 2018, Aotearoa New Zealand

Figure 5. Ophelia Mikkelson Jones, Men Carrying Flowers: Volume I, 2021, Aotearoa New Zealand

As a device for establishing site relations, the four walks provoke a site analysis involving elements of exchange, proximity and temporality. We probe, "What is it to read a site? – and create a temporary dialogue with a selected site?". Embarking on this self-initiated series of walks, it is the action/movements that take place which contribute to the site analysis: the location, distance travelled, duration, atmospheric conditions, and what they see, observe and connect with—site, human and non-human.

French novelist Georges Perec situates this approach aptly in "Species of Spaces and Other Pieces" (1974/2008) in "The Street" when he asks the question, "Do you see what's worthy of note?".[7] Section "Three (III). Practical exercises" puts the reader on notice to reflect upon the value of their seeing and the criteria their action/movements create, respond to and with. Perec asks multiple questions that could form a dialogic list to establish the temporary practitioner's relationship with the site. When he says, "Observe the street, from time to time, with some concern for system perhaps",[8] he points to the tactics of walking. To us, Perec's directives appear as a "HOW TO" and set of instructions for encountering while walking, encompassing both the when-with and the where-with of interaction.

PARTICIPATION

Participation is the second structuring framework we utilise in "The Collaborator: Participatory Practices" paper. As referred to earlier, the pedagogical strategies that shape the Minor are played out through various site negotiations, thinking about manifestations of "the site of". In this paper, we ask

students to centralise the exchange point as a site of participation through collaborative processes. Here, students consider site as a situational field by constructing an around, about in their capacity as maker, host, facilitator and collaborator. These types of exchange involve a touch of when-with and where-with. They call for a moment of decision—a point in time when a gesture occurs and is put into action. The around, about in this sense, takes form in the co-creation of a temporary community through reciprocity and exchange (of things, objects, conversations, relations).

Taiwanese-American artist Lee Mingwei invites participation through the gesture. The public is invited in by a future-leaning; a desire to gift a bloom on, to write a letter, to bring an item of clothing into the gallery for mending. Site in Lee's practice is created by social relations, acts of exchange and aesthetic dispersal – while the work is usually presented in the gallery context, the public is invited to engage in a participatory encounter that centralises reciprocity and locates it out in the world. In "The Moving Garden"[9] (2009–present), the artist calls for some extraordinary imagining where thousands of dispersed gerbera blooms map how (when and where) gallery visitors gift them on. In the first instance, the work is encountered in the gallery, where the public is met by a forty-five-foot-long sculptural granite form with a channel cut into it like a river that acts as a crevice-like vase for Lee's flowers. However, the heart of the work, what we posit as the site in this around, about fashion, is what happens thereafter in the durational exchanges of the project. Once the flowers leave the gallery, the kindnesses, as Lee calls them, are distributed in good faith from stranger-to-stranger across a city as unexpected acts of generosity, giving and receiving. The instruction on the gallery wall reads: "Let the act change between you and the recipient of your gift."[10]

Figure 6. Lee Mingwei, The Moving Garden, 2009/2014, mixed media interactive installation, granite, fresh flowers, 1200 x 134 x 60 cm, Installation view at Lee Mingwei and His Relations, Mori Art Museum, Tokyo, 2014, Photo: Yoshitsugu Fuminari, courtesy of Mori Art Museum

Aotearoa artist collective Public Share invites a different type of site relations through materiality and sociality.[11] Their art events explore New Zealand's tea break legislation and the worker's right to two ten-minute tea breaks in the working day.[12] Ceramic tumblers/cups are made from local clay collected from infrastructure worksites undergoing change and or sites of labour and social significance, which are then used and distributed via shared morning teas and refreshment events with site workers and art symposium attendees. The gesture offered is two-fold; it is both convivial and political – taking the time to collectively pause and have a cup of tea, and the invitation to take the tumbler home. Curator and writer Zara Stanhope, in her essay "Deficit and Care" in "Let's Go Outside: Art in Public" (2022), says about Public Share, "…they have developed occasional projects that are quiet performances of public connectivity […] They are eager to foster the spirit of sharing they enjoy beyond the group, and an ethos of and invitation to exchange imbues their 'hosting' projects."[13]

Figure 7. Public Share collective, Carried Forward, Registration event at ST PAUL St Gallery Curatorial Symposium, Auckland Art Gallery Toi o Tāmaki, 21 August 2015

PUBLICATION

Publication is the third structuring framework and focus for the paper, "The Distributor: Publication Practices". Rather than centering forms of printed material solely, "publication" is taken to mean "to make something public" or "to make something known". To us, to publish means to share something beyond oneself with intentionality. In this way, a publication can mean a book or a magazine, as much as it can call for a megaphone, an Instagram page, or an eBay listing.

United States artist and writer Laurel Schwulst's publication project, "The Life and Death of an Internet Onion"[14] takes place over the course of five-weeks every year (there have been two editions since 2020). The project is a webpage that hosts pieces of writing on the topic of love in all its forms. Visitors to the website "peel" pages to go deeper into the core of the onion, and slowly, each layer decays over time and becomes inaccessible. Currently, the website is dormant, waiting for the new season. The humour of the project is evident – what webpage is only visible for five weeks of the year? There is a curious and funny overlap between the webpage form of the project and its subject of love: an equivocation between permanence and evanescence, a capacity for decay if not maintained, a perma-state of "being in development" – along with a kind of hidden code that is visible only to those "in the know".

When the public encounter a work, where and with whom they view it becomes a way to understand the site of publication as expanding beyond the borders of an object. In conceptualising their project, we ask our temporary practitioners to consider the type of public they are engaging with by asking; Are they Accidental publics, Assembled publics, Private publics, or Non-publics? In bringing their attention to this aspect, the students begin to think through expressions of "publication" within their creative practice via action. For example, does their project-public cluster around a single object, each taking turns to flip a page? Or are they distributed over the web, unaware of each other's existence while scrolling? Perhaps they are a neighbourhood, all listening to a pirate radio broadcast with varying levels of volume and clarity, depending on proximity to the signal? Or maybe the public is in their cars, circling a roundabout reading a DIY-painted banner. This where-with works alongside a

durational element too, where publications can be long-lasting, archivable and solid, as well as something that can disappear into memory.

Figure 8. Saara Satele (Temporary Practices student), "See ya round" for "The Collaborator: Participatory Practices" paper, 2021

Conceiving the when-with and where-with in this way highlights how "publication" can reach certain people via differing levels of access and intentionality. Through a project's form, publics can become aware of themselves as a grouped audience or a like-minded temporary community, whereas other times, they may never know they've been folded into the around, about site of the work. The "making public" aspect of artworks also suggests that they shape publics and not just by addressing them as such. By contributing to discourse and dialogue, "to make public" becomes "making a public" or "making the public". It becomes part of a durationally extended cycle, in which single publications are but one link in a chain that works over time to make real the poetic worlds held within them. As American Professor in English Michael Warner states in "Publics and Counterpublics" (2002), "Public discourse says not only: "Let a public exist," but: "Let it have this character, speak this way, see the world in this way." It then goes out in search of confirmation that such a public exists, with greater or lesser success—success being further attempts to cite, circulate, and realise the world-understanding it articulates. Run it up the flagpole, and see who salutes. Put on a show, and see who shows up."[15]

COLLABORATION

The fourth structuring framework, collaboration, is at the core of "The Event: Collaborative Practices", in which students are asked to select an object that acts as a social conduit. This capstone project is staged across an entire semester; the aim is for projects to draw on the conventions and conceptual terrain of site, participation, publication and collaboration to produce a final project that synthesises learning in the preceding papers. A key focus is how collaboration as a methodological

structure and event as an organisational force can play pivotal roles in the way we might conceive of site as an around, about.

Students are prompted to set something in motion and practise in a propositional manner for the first half of the project and then move into the "publication" phase. While their work often takes a linear form over the semester, they are encouraged to retain a responsive stance that locates the when-with and where-with of their doings at the centre of the artwork. The students' projects are made up of a series of socially-oriented activities that occur over time with associate objects, ephemera, invitations, recordings (and more) in order to activate a register of provisional temporality and duration.

Figure 9. "The Plate" project sharing event for "The Event: Collaborative Practices" paper, 2022

In 2009, British-American artist Lenka Clayton collected 7,000 stones from within a three-mile radius of Steinheim Museum in Allegany County, New York, during her tenure as Theodore Randall International Chair at Alfred University. This conceptual artwork, titled "7,000 Stones"[16], responds to the history of the Steinheim Museum, known for its collection of hundreds of thousands of artifacts being lost, stolen or going missing over the course of 100 years. Each stone was hand-painted with an acquisition number from 1 to 7000, and were then placed in one large pile in the exhibition space with a simple wall instruction stating, "Please take the stones". Clayton couldn't anticipate the hours the public would spend sifting through the pile of stones to find a number that held personal meaning, nor could she anticipate how many, if any, might remain at the show's conclusion.

In this work, site is literally stretched by the action of participants taking the stones away from the Museum location. How far do they travel in the pockets and bags of those who carry them? We don't know. Therefore, the site of the work becomes a form of around, about. Clayton further expands this conception through the act of repatriating the remaining stones, hoping they will be discovered by unknown future participants. In this moment, the intersection of site-event-time is incredibly charged in how the work takes on an extended-durational aspect that cannot be anticipated, corroborated or confirmed.

As a learning space, this idea of site as an around, about in conjunction with making projects that are propositional in nature can be challenging for students to "hold" ongoing. Through the pedagogical tactics, as outlined, students learn to navigate this challenge through the use of social practice

processes/methods that both exploit and expand how the artwork can be distributed, documented and recorded.

CONCLUSION

In summary, we began by positing our notion of the term, “around, about”, as a way to locate site through concepts of exchange, proximity and temporality, in contrast to being bound by the usual technical depictions of physical sites (with edges or borders). In thinking through this conception of site as a stretched, continually expanding and contracting force, we position site as being formed by modalities that highlight distribution and interaction. It is an active bringing-together where site relations are generated in the 'when and where'. For us, when-with distribution modalities in social art projects create a perimeter, and where-with relations form via exchange and proximity to conceive these around, about sites. The public is also critical in this framing; their receiving and reception provisionally construct a perimeter around, about a given project and what we consider the site-of-publication.

"Site" is an ever-present factor in making temporary projects; it is what we always return to as the grounding context for a work. As such, site as a pedagogical schematic within the Temporary Practices Minor is designed to provide the conceptual, contextual and methodological conditions that are then embedded via our key strategies of HOW TO documents, the “co-” teaching model and the coursework structure as framed through Site/The Traveller, Participation/The Collaborator, Publication/The Distributor, and Collaboration/The Event. These combined perspectives result in projects that highlight local goings-on, distribute ephemera, and involve passers-by in chance encounters. This around, about understanding of site, stretches to hold these points of contact, even if only temporarily. We understand this paradigm as intrinsic to Temporary Practices, in which a relational tension forms and reforms different ways of being-together across multiple time scales.

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PEDAGOGICAL TOOLS FOR MEDIA STUDIES: AN ANALYSIS

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INTRODUCTION

A large number of challenges face the media industry with the advent of Web 3.0 and social media. Online presence and visibility are some of the important techniques and skills to be taught to the students who usually stay immersed in written assignments and examinations. A media student has to learn experientially and for this it is crucial to develop hands-on training aptitude. Some important questions relate to whether such skills are in-built or maybe acquired. Another important aspect to explore is how are these different from the most basic forms of learning to read and write developed at the kindergarten level. Media literacy and information literacy are few terms to be explored along with some other core concepts.

This paper explores these questions and finds answers to some of these visible conflicts in media teaching. It draws on a broad range of research papers and deals with some pedagogical tools used in Indian universities where students study from various states of the country.

NEW AGE LITERACIES

Since the advent of internet and keeping pace with the times, most universities are resorting to technology in imparting education. In the media landscape, technology plays a crucial role in determining ways in which content is created, consumed and portrayed across platforms and channels. Hence, to stay updated and to provide latest learning tools universities have had to adopt new age literacy tools to impart media education. In order to understand these tools better, it is important to go deep into what is meant by information literacy, media literacy, ed-tech and knowledge economy.

Information Literacy

According to UNESCO (2012)[1] information literacy includes the following skills:

- Identifying/recognizing information needs
- Identifying sources of information
- Locating or retrieving information
- Analysing and assessing the quality of information

This skill essentially includes the ability to recognize a target audience and work on the information needs of others. The student should be taught to identify such needs of consumers and citizens and work to fulfil those. It can be a challenge to acquire such skills to promote and fulfil others' needs in such a way. This form of literacy also includes identifying sources of information, locating information, generating data and then analysing and assessing the information thus received online for

the users. The role of the media practitioner be to facilitate the use and access of data so it maybe used constructively for purposes known to the consumer. Information and communication technologies (ICTs) have made it ever more important to retrieve such data and make it easy to use for the netizen. Media training requires that students should be trained in retrieval of such information to make the task of the user and media consumer easy and productive. In the field of information retrieval, advanced digital technologies are used including artificial intelligence (AI) and machine learning (ML). Students should be trained in getting information in new ways so that they maybe trained as a journalist, filmmaker, social media influencer or any other media professional. It is essential to have knowledge of advanced machinery and information retrieval systems including AI as it can transform democracy and future of citizens in a big way.

Data society

There is a rising trend among media practitioners in the field of retrieving information online in the form of data. This requires the skills to gather data and develop the knowledge of data mining, data sorting and data visualization. In almost every field of media- journalism, film, advertising and public relations or corporate communication, data plays and inevitable role in ascertaining big corporate decisions and deciding media and public relations strategies and campaigns. There is a deluge of big data and appropriate skills are required to sift the right data from the incorrect figures, tables, charts, maps, illustrations and media. Deciphering the right data and utilizing that to the maximum benefit of the organization to enable it to yield big results and profits for the audience means our students need to be trained to read into big data. A small task of a journalist can be to read data, visualize it in the form of charts, graphs and bar-diagrams and interpret it for the readers. Students need to be trained to analyse such figures and these are crucial data reading skills developed in media institutes. These skills are beyond cognitive or any other learning abilities required in a regular school. These skills maybe learnt with ease and with basic knowledge of mathematics and statistics. The student simply needs to have a basic background in descriptive and inferential statistics. The right application of statistical calculations are taught to the media student who can use information in ways that can predict outcomes and trends. This raises the question about what is the right form of learning in media.

Media learnings

As depicted in the figure below, media learnings are designed in such a way that the student doesn't simply learn by memorizing or acquiring skills but the form of learnings in media are through self-motivation, self-empowerment and self-actuation. This essentially recognizes the need of an individual to articulate and showcase to the world her innate ability to express, communicate, actualize, motivate self and others around her. Just as we have Maslow's hierarchy of needs, similarly in media we enable the student with skills and tools that make her not just a good communicator but a well-rounded personality who has the ability to use the media tools to her advantage in making her an enlightened citizen with skills to empower others. These learnings are thus beyond the classroom pedagogy in closed doors and form the basis of self-development and self-actualisation framework. The greatest leaders in our times have been the best communicators. Every student is taught the skills in such a way that she becomes a citizen, a leader in her own way sharing the tools and the skills to write a story to empower others around her.

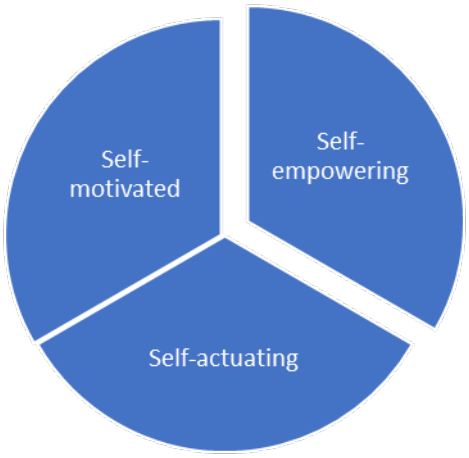

Figure 1. Form of learning in media[2]

Media Literacy

Media literacy can be divided into these sections:

- Aesthetic and creative skills- an ability to view, listen to, create and interpret media contents.
- Interactive skills- an ability to communicate through media and an ability to identify with different media roles.
- Critical analysing skills- a skill to give meanings to and to understand different media contents.
- Security skills- a skill to solve problems and situations and avoid unpleasant circumstances.

This implies that media literacies maybe developed from a very young age in a student and maybe developed at any later stage of life as well. These skills are different from the acquired forms of learning as developed through the use of alphabet, text or speech. Media skills are a combination of creativity, interactivity, analytical and design thinking or innovation through problem-solving and conflict resolution. Such form of literacies maybe depicted through the figure below:

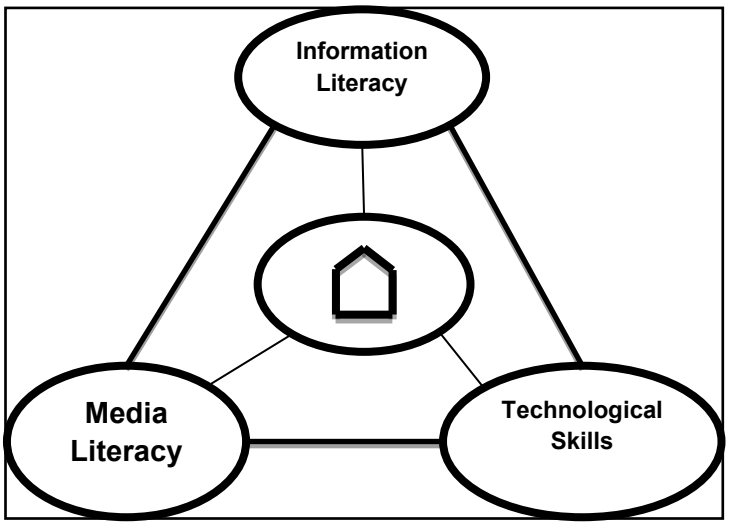

Figure 2. Information literacy, media literacy, technological skills are interrelated.

This figure explains that new age literacies are indeed not demarcated or categorized into any one or the other form or shape, but are an interplay of media, information and technological skills. This raises the question: what are the tools for new age literacies? A possible answer may be found in the table below:

Pedagogical aids are the dozens of forms of 'new literacies':		
Cultural	Visual	Multiple
Interactive	Workplace	Media
Critical	Consumer	Cross-cultural
Moral	Historical	Scientific
Mathematical	Technological	Political
Geographic	Multicultural	Ethnic

Table 1. Pedagogical aids for 'new literacies'[3]

In order to train a young media professional it is important to make them aware and educate them about these forms of 'new literacies'. These literacies maybe learnt experientially, which will be discussed later in detail. These literacies are important to make a media student holistically equipped with the required knowledge and etiquettes, including the learning of soft skills, to facilitate her in the daily duties of a media practitioner. Out of all these, multicultural literacies are the most crucial- where the practitioner exercises basic routines and habits in accordance with the culture of a place or workplace. There is also a 'new culture' around the use of technology or online platforms, which is more global and diverse. The advent of applications and technology has given rise to the ed-tech platforms which have become very popular with the new generation of students.

This indicates that media and information literacy (MIL) becomes very important among teenagers, adolescents and minds of an impressionable youth of any country. Students are encouraged to clear their concepts around basic ideas of literacy and 'media tools' which become their main weapons of creativity in their pursuit of excellence in knowledge-building. In a lot of instances teachers determine whether they 'pass on information, show examples or illustrations of the new information and how it works, give the learners second-hand experience by working through examples of the information in practice, or place the learners in hands-on situations, and require them to demonstrate their abilities with the new information'. Hence new forms of learning are about engaging students as audiences and participants in creativity and keeping their vision and perspective in mind. This encourages complete participation and engagement by the student. The following figure indicates the time spent by young students in consuming different media in Germany:

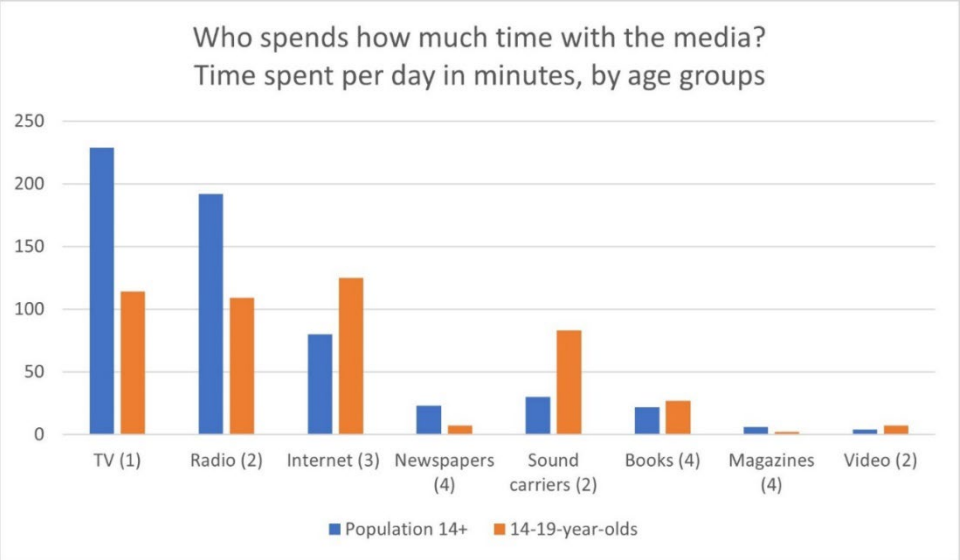

Figure 3. Media consumption habits of teenagers[4]

Ed-tech

There are innumerable applications and websites to generate e-content for students, starting at K12 uptil graduation and postgraduation. Traditional methods have been replaced with more technology in the classroom. This has resulted in widespread use of information online giving rise to a digital student citizenship. These applications are used as effective platforms to educate the child about the nuances of different subjects, including video editing, making powerpoint presentations, learning mathematics, computation, data and other such skills required for creativity and interactivity. Videos have become widely popular with students learning from videos of teachers. Its widespread use has given rise to a more hands-on approach to learning which has been discussed below.

MEDIA STUDIES: HANDS-ON APPROACH

The approach towards teaching media skills to a student is more hands-on than through textbook learning. Keeping in mind the philosophy of 'learning by doing', media curriculum has been designed to address the basic needs of a student to learn skills on various softwares, writing formats, video and audio presentations and so on. While some schools focus on community development, others address the issue of bridging the imbalances in 'media food chain' through various initiatives by Big Tech. Some media training institutes focus on developing the socio-economic and political knowledge of students and honing young talent in media. The focus of different media schools differs in its basic outlook towards grooming young talent and preparing them for the industry. However, the common thread that unites them all is the practice-led approach to learning.

Tools for teaching

At Bennett University's Times School of Media, several tools are used for teaching for the current media practices across the globe. The pedagogical tools are keeping in view the mobile media perspective and changing media landscape. The focus is more on practical learning through lecture series, workshops, field visits, lab work, project preparation and practice-based submissions as assignments. It is noted that "meaningful learning happens when students try to make sense out of the world by filtering new information through their own existing knowledge, concepts, rules, hypotheses, and associations from personal experiences" and the teacher's job is to be the catalyst and help the student find her own voice and understanding on the subject matter. There are Mac laboratories to assist the student in working with various video editing softwares to edit and tell their

stories. Students are encouraged to share a camera and work in groups so that work can be assessed as a team work. During the pandemic, online classes through MS Teams meant that teachers had to share their screen and teach them how to work on the software while the students worked on their individual systems at home simultaneously. Once the practical class finished the student was asked to share her screen and showcase the work before the class at the virtual platform. Some of the classroom work and teaching has been shown in the figure below.

Figure 4. Practical tools for teaching at Bennett University

Experiential learning

The focus at the university is on experiential learning. While young graduates take up electives and prepare their newspaper, or Instagram reels or a short mobile video, the postgraduate students usually come up with a single project at the end of the year. There are students enrolled in Doctor of Philosophy in media studies and they are allowed to take up practice-based submissions (still awaiting approval). Students at every stage are introduced to softwares and creative gadgets where they enhance their skills and promote their work where the best creations are showcased on a student website titled 'The Times of Bennett'. There is immense work done by students on producing a newspaper, called *The Times of Bennett* newspaper, producing a news bulletin LIVE in the studio from BUTV premises, producing reports, podcasts, videos, multimedia stories by students, presenting work taken up for Greater Noida City Social Media Projects, producing advertisements for student startups (associating with Centre for Innovation and Entrepreneurship). Some of the work showcased on their website is shown below:

Figure 5. Student creations at Bennett University[5]

Media learning processes

Thus we see that media learning processes have changed over the years, from being more lecture-oriented to more practice-oriented work with great student engagement and participation. Learning theories in education give us an insight into how students adapt to and learn from the way they are taught.[6] Learning theories state that there are three main ways of imbibing knowledge imparted to students:

- Behaviorism: It is based on the idea that knowledge is independent and on the exterior of the learner.
- Cognitivism: These were developed in early 1900s in Germany from Gestalt psychology by Wolfgang Kohler. It is in response to thinking and processing information.
- Constructivism: It is based on the premise that we construct learning new ideas based on our own prior knowledge and experiences.

These learning theories indicate that education and teaching needs to adapt ways and methods in consonance with such theories so that student is given enough freedom and independence to explore themes, concepts, learning tools and paradigms. This brings us to the notion of 'information literacy' as expounded by theorist Zurkowski in 1974 who first used the term 'information skills' to refer to people who are able to solve their information problems by using relevant information sources and applying relevant technology.[7] This highlights the view that 'self-learning' as an important process in education, learning and teaching should not be undermined and be given a priority. This gives rise to the question: should regular universities open their doors to 'open' learning?

Case for 'open' learning

Open learning provides the learner the flexibility to engage in the course as and when it suits her. It offers a variety of choices independent of the restrictions of time and place. The pandemic and online modes of teaching have made students feel they can learn at their free will and engage in meaningful dialogue through virtual platforms like Zoom, Google meet and webex and enhance their knowledge skills. Even post-pandemic, institutions have continued hybrid forms of webinars and meetings so that a large number of learners may benefit. While open learning is not the same as distance learning,[8] political and economic trends indicate better lifelong trained and qualified workforce, new education and training markets, information highway and a better information-economy.[9]

Open learning is basically ICT-driven and makes essential use of multimedia which is also very good for teacher training and training research students. Multimedia learning offers huge potential for channeling learning curves effectively and increasing learners' progress.[10] It can be the new age mantra in the age of Big Data and Big Tech. This is an important form of e-learning which offers immense opportunities to the learner. E-learning is synonymously associated with more effective and efficient learning outcomes.[11] Thus every university should find ways to impart the best possible education with a far-reaching impact through open learning courses.

CONCLUSION

It may be concluded that media and information literacy (MIL) is best suited for modern-day learning. Along with MIL, other literacies such as technology literacy, cultural literacy, geographical literacy, historical literacy, consumer literacy, critical literacy, gender literacy are some of the forms that must be encouraged among media students to ensure their overall well-rounded development. In addition to these literacies, learning behaviour of students must be streamlined to help them focus and keep them engaged in the course and intensive curriculum. Additional tutorial classes to monitor progress of their work, offline and online must be done for better outcomes, results and productivity. The students at Bennett University engage in forms of learning that are hands-on, practical, learning-by-doing, engaging and challenging. Students have to meet deadlines and successful completion of projects and assignments are uploaded on the student website for encouragement, greater participation and fostering excellent presentation skills among students. While videos, social media posts, podcasts, documentaries, newspapers, advertising copies are uploaded on the website, a facebook page is also created to enhance community-building and encourage a team spirit among students. In future, 'open learning' must be given a thought for better outcomes.

NOTES

[1] Alice Lee and Clement So, "Media Literacy and Information Literacy: Similarities and Differences," *Comunicar. Media Education Research Journal* 22, no. 1 (2014).
[2] Ramchandra Shigwan, "Information Literacy," *Bulletin of the Deccan College Research Institute* 74 (2014): 329–43.
[3] By John Buschman, "Information Literacy,'New' Literacies, and Literacy," *The Library Quarterly* 79, no. 1 (2009): 95–118.
[4] Ridder & van Eimeren, "Trends in Media Use and Evaluation from 1970 to 2010," *Media Perspectives* 2011, no. 1 (n.d.): 2–15.
[5] Bennett University, "Student Work," *The Times of Bennett* (blog), accessed April 30, 2022, http://www.timesofbennett.com/.
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[7] Lai Jiang and Jan Elen, "Why Do Learning Goals (Not) Work: A Reexamination of the Hypothesized Effectiveness of Learning Goals Based on Students' Behaviour and Cognitive Processes," *Educational Technology Research and Development* 59, no. 4 (2011): 553–73.
[8] David Kember and David Murphy, "A Synthesis of Open, Distance and Student Centred Learning," *Open Learning: The Journal of Open, Distance and e-Learning* 5, no. 2 (1990): 3–8.
[9] Kember and Murphy.
[10] S. A. Onasanya, "Selection and Utilization of Instructional Media for Effective Practice Teaching," *Institute Journal of Studies in Education* 2, no. 1 (2004): 127–33.
[11] S. A. Onasanya and G. B. Ogunojemite, "Conceptual Pedagogy and Engaging in Effective Multimedia and Instructional E-Learning Courseware Design," *Research in Curriculum Studies Journal* 41, no. 1 (2015): 67–76.

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INCLUSIVE SCROLLS: BRIDGING ACROSS THE DRAWING'S EDGE

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INTRODUCTION

Design-by-drawing is, and has been, the most commonly employed method for solving design problems.[1] But as drawing enters the age of post-digital representation, what is the function of architectural drawings, particularly those drawn by architecture students that are conducive to learning? This paper discusses the design and the examples of a drawing method that reengages the act of drawing through the collective and collaborative rather than the singular and the individualistic. It capitalises on its scalable benefits of "relational collaboration" in order to reinvigorate drawing literacy while cultivating learners' ability and desire to collaborate across their drawing boards.[2]

Design by Drawing

Learning design through drawing has been, and continues to be, the most fundamental method of studying architecture. Beyond an instrument of communication, drawing is an instrument of thought. Drawing is so ingrained with the act of design that the words 'disegno' in Italian and "dessiner" in French, means both to design and to draw. To draw, therefore means enabling the intellectual capacity to invent the design. Alvaro Siza argued the importance for architecture students to acquire the ability to learn "how" to learn. He asserted that this ability is linked directly to drawing, as "learning to see is to understand and to express through drawing."[3] Others have made similar observations and reflections.[4] Regardless of digital or by hand, the teaching of drawing has traditionally been exercised through required courses under the purview of visual communication. The goals and premises tend to be on enhancing the mastery and deftness of the individual students. Focusing mostly on cultivating student's "individual talent and creativity" and not their capacity to work with others.[5] Therefore, despite the synergetic and mutable potential that drawing can create, one question remains unanswered. If drawing can arouse a productive symbiosis between the mind and the body within an individual, what happens when a collective draw together? What, if any visual, cognitive, and social interaction will this togetherness ignite? (Figure 1). How about when the action of drawing is expanded to involve two, five, ten, or even twenty collaborators? This article explores what goes beyond the individual, and toward its impact on the collective.

Figure 1. Twenty participants preparing the drawing paper for the five days collective drawing engagement.

Collective Drawing

During the twelfth century, Chinese artists used handscrolls – linear formats in vertical or portrait – to depict urban or natural landscapes, typically between 20 to 25 centimeters in width and stretches 2 to 6 meters in length. One of the best-known examples is the horizontal scroll *Along the River During the Qingming Festival,* also known by its Chinese name *Qingming Shanghe Tu* (清明上河圖) where artist depicts urban life using an overhead quasi-isometric view.[6] Copies and variations of the scroll abounded in later dynasties (Figure 3). The Qing-dynasty version in the collection of the National Palace Museum in Taipei is one renowned example. It is also the collaboration of five painters Chen Mei, Sun Hu, Jin Kun, Dai Hong and Cheng Zhidao, all belonging to the imperial painting academy under the Qianlong Emperor.

Figure 2. "Along the River During the Qingming Festival". Image credit by Palace Museum, Taiwan.

Collective drawing also has a long lineage in other cultures. For instance, cave drawings from the Paleolithic period are the primordial evidence of a collaborative creation process[7]. There is the writing and drawing games --also known as the Exquisite Corpse-- conceived by the Surrealists André Breton, where he declared in the *Second Manifesto of Surrealism* (1930) that 'the collaborative efforts intends to result in the creation of a unique sentence or drawing'[8]. Along with the lesser-known weekend drawing improvisation of "Dot-the-dot" by the Texas Rangers in the 1950s also comes to mind. There, the emphasis was on the inventive fluency in hand drawing combing with an innate knowledge of historic European city plans.[9] In more recent times, Yoshiharu Tsukamoto and Momoyo Kaijima of Atelier Bow-Wow have challenged a group of students at the Delft University of

Technology and Harvard University's GSD to observe their urban surroundings and to record their discoveries through a series of 'Public Drawings'. Furthermore, other collective drawing advocates includes the practices of Niall McLaughlin, David Gersten, Jill Journeaux, and Carol Arches. These approaches of the communal contribution challenge the singular authorship and explores multiple perspectives. It encourages shared conversation, imagination, responsibility, and working together (Figure 3).

Figure 3. The workshop took place during the summer of 2021, where twenty participants drew collectively and created six pieces of inclusive drawings of various sizes, subject matters and scales. The 10m by 1.5m final drawing seen here explores the collective memories represented by the MTR Stations in Hong Kong.

Methods of Engagement

The collective drawing discussed in the following begins from the making and discussing of its rules. People and ideas for engagement are the two basic elements needed to start a collective drawing. From there, a deliberated set of procedures, and methods enables the participants to engage in the drawing process. Subsequently is the opportunity to decide and develop other conditions such as the theme of the drawing; the drawing instrument; the duration of time dedicated to the production; the surface through which the drawing can be drawn on, is it on the stone floor of public space, a piece of large paper, or multiple pieces? (Figure 4). These conditions and questions are opportunities to draw in conversation between the participants. The process allows for improvisation and interactive fluency which no single participant can fully control. Collaborative partners can build on their solidarity as well as their differences; complementarity in knowledge, working habits and temperament. Collective drawing stimulates and challenges participants whose efforts are expanded by watching a classmate, trying to keep up with him or her. I will further elaborate on the details through the following two examples, *"Kowloon Streets, Past-present-future (2020)"* and *"The Mass Individual (2021)",* which were created over the course of two workshops. Both examples explored the drawing system through the urban life of Hong Kong. The projects exemplify the productive tension and relational collaboration created by drawing together.

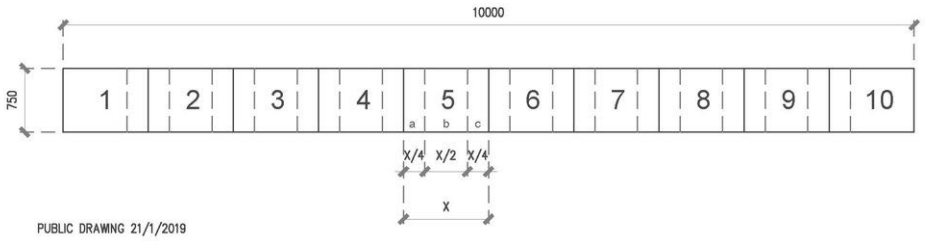

Figure 4. "Kowloon Streets, Past-present-future" each participant operated and drew within a single numeric confine. At the same time, the same participant would need to work across the confine to collaborate with its neighbouring colleagues.

City Streets

"Kowloon Streets, Past-present-future" is a collective drawing created through the research, observation and reimagination of the streets of Kowloon. In the research phase of the drawing project, both primary and secondary sources are involved. The first is a drawn ethnographic survey – through walking, drawing and note taking -- of the streets that the individual participants were exploring. The second was through the reimagination of the novel *Atlas, An Archeology of an Imaginary City* (1997) written by the Hong Kong writer Dung Kai Cheung.[10] The book offered a mixture of facts and fiction, narration and description. In particular, there are twelve chapters that dwelt into the streets of Hong Kong; accounting their histories, literature records, myths, and fantasies. *Kowloon Streets, Past-present-future* was drawn through the close reading and imaginative reflections of these two sources. With Dung's fiction and their individual observation in mind, participants each drew a street's characteristics from what it was, what it is, to what it could be. The inclusive drawing folds, blends, propagates, and extrapolates history, theory, and fiction.

The 10-metre long drawing is equally divided by the number of students. Each student is responsible for drawing within a randomly assigned numeric confine, each area is identified by a, b, c, in which the width of area a = b+c. Using the streets of Kowloon as the source of inspiration, student could draw the buildings, signage, and people from any view, including elevation, axonometric, section, perspective etc. that create the best narrative. Beyond drawing what is observed, this exercise is a negotiated act, relational and contingent upon the actions of those contributing authors.

The deliberated planning in the early stage paved the way for the improvisation needed during the collaborative drawing. An example is shown in the transfiguration of Boundary Street and Tung Choi Street, revealing a dialogue and convergence between two spaces and times drawn by three different participants. For this interface to be imagined and visualised, historic research was needed, and a fictional interpretation of Dung's Atlas was rendered. The drawing depicts the transformation of the district around the territorial boundary between the British Kowloon and Chinese New Territory. Before 1860, farmers from the north came to the boundary to sell flowers to the British at the south. Later when the border dissolved, Boundary Street was named in memoriam. The scene then moved to Tung Choi Street on the right, where again there is a contrasting image of the present and the past. The upright image contains today's pet fish shops, giving its nickname "goldfish street". In contrast, reflections in the water puddles on the road showed an unfamiliar world of the past. The drawing juxtaposes different time-space rooted in the same geographical context. The rhythmic pulsation from one named street to another was only possible through an imaginary in-between which is entirely fictional (Figure 5).

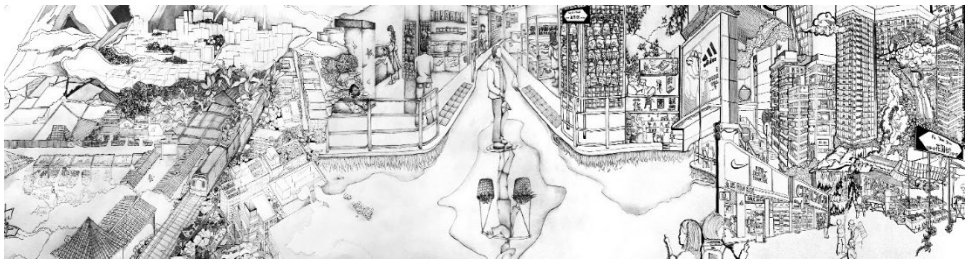

Figure 5. Detail of Boundary Street and Tung Choi Street in 'Kowloon Streets, Past-Present-Future', demonstrating a multi-temporal and spatial moment. Participants: LAW Siu Shan Susan, NING Hiu Kan Carol.

Kowloon Streets explores the manifolds of the city's reality, searching for and imagining identities that the city possesses. By juxtaposing drawings of different streets by different participants, the drawing scroll becomes a "Multitopia" echoing Dung Kai Cheung's words: "cases of sudden transgressions of one space into another...is an open place, welcoming choice and inviting the unexpected" (Figure 6). Part of the purpose of this drawing exercise was to help the participants to identify key archival contents of their studio projects. Since drawing is selective, what they chose to draw affirms elements and issues that interested them. This identification helped the participants to develop a narrative for their project. For example, in WONG Ka Lok Victor's work, he identified the post-1930s tensioned cabled street signs as the repository content for his archive. Due to the change of regulations in 1996, no new signs were allowed to be put up in the city. Therefore, the street sign holds a significant value for the people of Hong Kong as it is closely associated with a nostalgic period and genre of Hong Kong. After the inclusive scroll drawings, participants further translated their designs (Figure 7).

At the end of the drawing project, Dung Kai-Cheung was invited to the School of Architecture to discuss his creative writing process of reinterpreting the tale of the city through its streets, buildings, people, things, and history. We discussed how the city serves as the common ground between architecture and literature. And how both creative forms learn from the city, and in turn reshape the city through its reimagination. Generating a kind of dialogue on the reciprocal relationship between history and fiction, or the notion "Future Archaeology", a term how Dung have described his work (Figure 6). Against this backdrop, the inclusive drawing project is the process and the product of constructing a multi-temporal and spatial moment. As an activity, it is connected to a specific and singular space and time. It is an action in the present tense, from the time a drawing begins to the time it is finished. As a material matter, it can endure time and travel across places. By designing drawing collectively, the project aims to sow the seeds of imagination and collaboration in the young minds of the would-be architects.

Figure 6. Novelist Dung Kai Cheung joined our participants to discuss his creative process of working with Hong Kong by playfully crisscrossing between fiction and reality. Framed around the notion of Architecture, City and Narration, the discussion focused on the awareness of the creative process across the cultural disciplines.

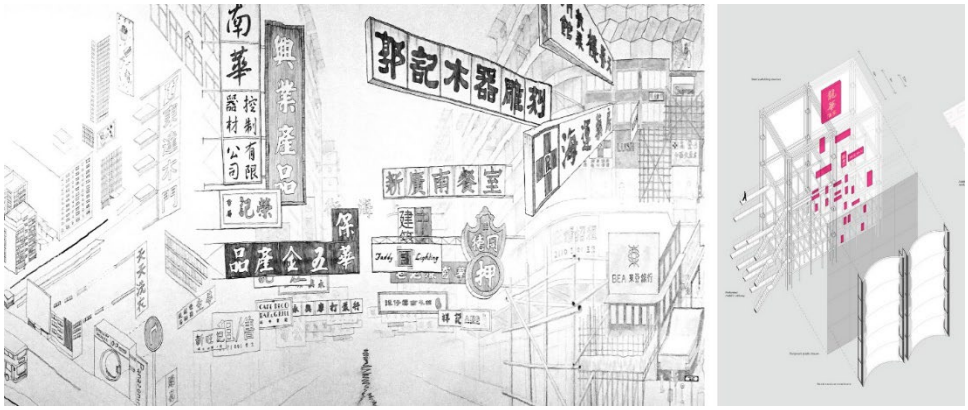

Figure 7. The initial inclusive drawing analysis on the left focusing on the disappearing street signage of Hong Kong led to the conceptual development of a term-long design project of an archive on the right.

Home Bound through MTR

Prior to the start of the second project participants were advised to determine a general topic that offers the broadest common connection between them. A theme that would invite everyone to participate meaningfully and productively. As such, it was a mean to explore the question of the masses and the individual. The participants decided on the Mass Transit Railway (MTR) as the subject of their collective drawing (Figure 8). The MTR is an indispensable part of Hong Kong and is engrained in the economic, social, and spatial memories of the Hong Kong people. After a long and intensive discussion, the participants felt the need to frame their collaboration through the lens "Identity". Something that the participants can all relate to yet also offer sufficient differences to emerge. As a concealed cut, section embodies and reveals new territories for the continued architectural experimentation of present and future. Designing and thinking through section immediately establishes a relationship among architectural form, interior space, and exterior site, where the consequences of scale are tangible and visceral. In architectural conservation projects, sections serve as a retrospective, rather than prospective tool, an analytical device instead of a

generative instrument. By looking into two directions in time, *"The Mass Individual"* enables participants to see the transformation of the stations, which entails the continuity of identity.
Before drawing, participants researched original sketches of the design, the station's history, context, and produced inferential sectional drawings, which demonstrated the archaeological layers of the stations. It was an act of constructing a visual narration of the building's history. The section drawing accentuated the collage nature of the urban development process, which coincided with the expansions of the MTR system. The drawing is part analysis and part imaginative extrapolation that triggered a new frontier. The specific apparatus is through the buildings' section. Derived from both archaeological and anatomical practices, the section was originated as a retrospective tool and an analytical device. However, in "Vertex and Vortex- A tectonics of Section", Jennifer Bloomer described the convergence of inscription and incision as the moment when a section is born. To inscribe is to capture a situation by giving it a visual presence. It is a trace, a memory, a description in between the viewer and the spatial narrative beyond. To incise is to discover the unknown of the beyond. It is a physical act, a temporal state of reading and understanding. Furthermore, the notion of gravity and orientation must be considered in the making of a section. She argued that "a plan is a section which demands the presence of gravity". It must be connected to the world of tension and compression.

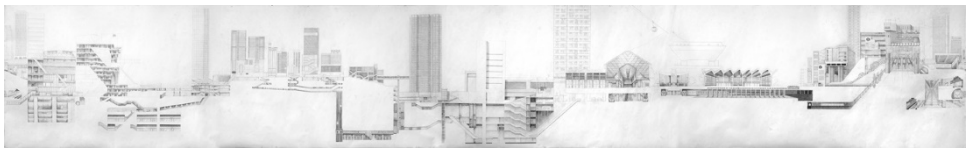

Figure 8. "The Mass Individual" converges MTR stations from various locations of Hong Kong, each station home to the participating individuals. It is simultaneously for the masses and the individual as well.

"The Mass Individual" is a one-and-half meters by ten-meters long scroll in graphite over an intensive four days' period. The drawing is part imagined and part "real". Station's physical connection does not exist in reality and its scales also differ. This interplay with imagination and reality was what excited the participants to most (Figure 9). The reconfiguration of the stations is decided based on the participant's conversation and arranged based on the station's 'ambience sentiment'. A reference recalling "métagraphies" produced by Guy Debord, a map which composes the different districts of Paris, not by their geographical connections by based on the ambience each creates.[11] As the workshop proceeded, we found that the interaction between the multiple participants reveal the benefits of "relational collaboration". Not all collaborations are equal. According to John Hagel III, relational collaboration is derived through an exchange of tacit knowledge.[12] It offers creative autonomy while learning from others. It is founded through a carefully designed learning environment and framework including the rules of engagement, atmosphere, time, and space. This observation could be found in the previous drawing workshop that the author has conducted.[13] Unlike "transactional collaboration" that works in a linear progression, vis-à-vis the Fordist division-of-labor. Relational collaboration is a scalable benefit that is contingent upon others' creations. For example, the end of a drawing would inevitably trigger the question for the adjacent participant on how best to continue, complete, explore, extrapolate that ending. It is a creative act waiting to happen. This differs significantly from "transactional collaboration".
Although necessary in the production of architecture, transactional collaboration offers very little contribution to the creative synthesis. Rupert Wegerif, an artist who practices collective drawing has suggested that dialogical activity creates a space of reflection between participants where ideas

interact and participants can productively and imaginatively build on each other's proposals.[14] These attributes can be witnessed during the making of "The Mass Individual".

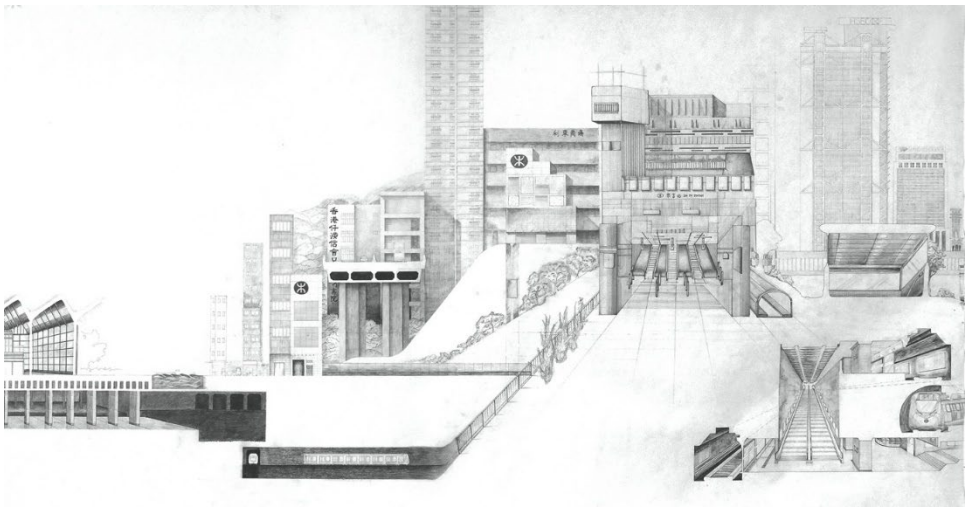

Figure 9. Detail of The Mass Individual showing Lee Tong station converging with Lok Fu station and Central station. The three stations are physically in different locations.

CONCLUSIONS

The collective method demonstrated through the two examples enable creative autonomy while encourages drawing together. It highlights the benefits of relational collaboration, particularly in design education. Although architecture practice demands an interdisciplinary, collaborative, and team-based endeavour.[15] An architect's education has remained fixated on the individual. Working individually and collectively, the drawing system narrated in this article offers an alternative that challenges the ingrained notions of penmanship, originality, and ownership that dominate our preconception of architectural production and competency. In the age of post-digital representation, the drawing method serves as a site of imaginative exploration, and it argues for a critical and methodological approach that transcends the limits of the individual. The drawing exercise is one such framework that enables the translations from the analytical to the projective imagination, allowing the drawing to regain its position as an instrument and activity of thought.

Figure 10. The scale of the drawing offers an immersive experience to the visitors and invites a public discussion of the work.

NOTES

[1] Dana Cuff. “Teaching and Learning Design Drawing”, *Journal of Architectural Education*, Vol. 33 (3). London: Taylor and Francis, 1980.
[2] John Hagel III, John Seely Brown & Lang Davison, “From Do It Yourself to Do It Together”. *Harvard Business Review*. February 18, 2010.
[3]Alvaro Siza. *Casabella*, Vol. 72 (770). Milan: Elemond 2008.
[4] Bruno Latour has coupled drawing and thinking as not only an embodied experience but gives credence to its ability to enhance comprehension and trigger imagination. Others have argued for drawing’s capacity to stimulate synthetic feedback between the haptic and the cognitive perception; as well as our ability to understand the world. It includes research and experiments in the fields of fine arts (Alpers, 1983), architecture (Frascari, 2011), and psychology (Arnheim, 1974).
[5] Andrzej Bialkiewicz. “Propaedeutics of teaching drawing to architects”*, Global Journal of Engineering Education Vol. 21 (2)*. Australia: WIETE 2019.
[6] Even though modern museums often display handscrolls stretched out full-length under a glass case, they were originally intended to be held by the viewer, who would unroll only an arm’s length section at a time. Starting at the right end of the scroll, and progressing to the left, the viewer determined the pace. With the use of perspective, the artist can make something seem to come closer and then to recede. A handscroll can show the same object from different angles, creating moments of suspense to entice the viewer to keep on looking. See: https://www.comuseum.com/painting/famous-chinese-paintings/along-the-river-during-the-qingming-festival/
[7] See David Whitley. *Cave Paintings and the Human Spirit: The Origin of Creativity and Belief.* Prometheus 2009. p.35. ISBN 978-1-59102-636-5.
[8] André Breton, “Second Manifesto of Surrealism,” in *Manifestoes of Surrealism*, trans. Richard Seaver and Helen R. Lane (Chicago: University of Chicago Press, 1972), 178–179. (Bialkiewicz, 2019).
[9] Mark Morris. “All Night Long: The Archtiectural Jazz of the Texas Rangers”, *Architectural Design,* Vol.83 (5) 2013, p.20-27. Chichester: John Wiley & Sons, Ltd
[10] Atlas: The Archaeology of an Imaginary City is Dung Kai Cheung’s first acclaimed novel. It is a quasi-fiction of Hong Kong, or the ‘City of Victoria’, as often referred to in the book. The book is a mixture of fact and fiction, narrative and description. Twelve chapters dwelt into the streets of Hong Kong; accounting for their histories, literature records, myths, and fantasies.
[11] See Gilles Rion in FRAC Centre-Valde de Loire https://www.frac-centre.fr/_en/art-and-architecture-collection/debord-guy/the-naked-city-317.html?authID=53&ensembleID=705
[12] John Hagel III, John Seely Brown & Lang Davison, “Defining Common Collaboration Tensions”. *Harvard Business Review*. May 7, 2009.
[13] It is essential to create an environment through which the group work can be generated. For the workshops noted in particular, it took place in a few different forms and places.
[14]Jill Journeaux, Helen Gorrill and Sara Reed. 2020. *Body, Space and Place in Collective and Collaborative Drawing: Drawing Conversations II.* Newcastle upon Tyne: Cambridge Scholars Publishing.
[15] Peter Mackeith. “On Teamwork: Standards and Practices”, *SOM Journal* 2013. Ostfildern-Ruit: Hatje Cantz.

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HOW CRITICAL IS THE CRIT?

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INTRODUCTION

Recent experiences teaching design studio in an online environment have revealed opportunities for improving the practice of design critique (crit). By nature, the teacher-centric approach of a traditional crit reinforces a power dynamic rather than a collaborative learning dialogue. This homogenic attitude to education has exposed a lack of cohesion between the process of critique and the product of a crit. Nurturing learners' critique confidence is complex but not complicated. Key to our approach from a pedagogical perspective is an emphasis on active, learner-centred experiences, whereby dialogue is viewed as a collaborative learning mechanism within the design studio. Focusing on the development and support of higher learning strategies, specifically critical thinking, as well as designing critique opportunities that align with learning objectives, are central to our methodology and thus pivotal for re-framing critique within architectural design education.

The aim of this paper is to examine recent experiences in emergency remote teaching (ERT)[1] in relation to critical learning opportunities. Subsequently, this has become a catalyst for reviewing and re-framing our approach to critique more broadly across our three-year bachelor programme, in order to promote reciprocal knowledge transfer and mitigate hierarchical, didactic approaches within education.

The quality of studio teaching is within its capacity to offer experiential learning,[2] that is, a process of learning that is informed by doing and reflecting. Kolb's theory emphasises this as an active process that is cyclic in nature. In a studio environment, this occurs through iterative design, a physical means of learning through doing that involves testing (drawing and modelling) and critiquing (dialogue). We see this process as critical for the development and empowerment of the learner. Knowledge, therefore, is viewed as a reciprocal relationship; this establishes the teaching strategy as dialogic as opposed to authoritative. Dialogic approaches to studio teaching establishes social interaction and supports the development of learners' Community of Practice (CoP).[3] This takes the onus off the lecturer as the sole source of knowledge, which in turn fosters collaborative behaviours. This is key to developing resilient, independent learners and establishing professionalism within a pseudo-professional context (the studio). Reciprocity in knowledge transfer is viewed as key criteria within this inclusive design environment. For us, it is imperative that learners recognise the value of their contributions within the wider studio culture. Facilitation of collaborative practices, whereby participants engage actively and consciously, is an example of reflection-in-action.[4] In acknowledging that dialogue is not mutually exclusive, but rather a relationship, knowledge is acquired through the collective experience.

ONLINE TEACHING AND LEARNING

Typically, within our design studio environment, project-based learning can be broken down into process (designing) and product (critique), both of which have active and passive attributes. The process of design requires active participation from both the individual learner and the group as a collective. At each iteration, critical learning is dependent on opportunities for informal critique through varied feedback, including self-reflection, peer review and feedback between learner and lecturer. The broader role of the lecturer within the studio environment is to facilitate collaborative, social learning behaviours. This aligns to our ideology of education as a shared experience.

Given that collaboration is fundamental to our teaching practice, establishing collective experiences in a fractured setting (online) poses significant challenges. The mode of delivery in our programme is exclusively face-to-face, therefore recent online experiences have taken the format of emergency remote teaching (ERT),[5] which is seen as a temporary, reactionary approach. The requirement to swiftly change modes and contexts leaves little time for systematically developing content and delivery that is targeted to the environmental conditions, and instead a responsive methodology unfolds. The digital interface also means learners can choose to present themselves as avatars, mere dots on a screen, and this dis-connection from the physical dimension reverts a once-vibrant CoP to one that is stilted and intangible. The reality of this suggests a disruption to all facets of the educational experience. We have seen the resultant effects of this disruption evidenced through apathetic behaviours, culminating in lack of attendance and participation in online tutorials and lecture sessions. The key issues that we have identified, as illustrated in Figure 1, are passive participation, isolation and/or vulnerability, and dissolution of the collective voice. As the diagram suggests, these conditions are not hierarchical but rather cyclic in nature. Passive participation equates to the altered degree of conscious involvement that learners exhibit. Isolation is described as the cognitive distancing that occurs psychologically in individuals, which in turn transgress into a state of vulnerability. Dissolution of the collective voice is the resultant condition experienced across the cohort. These three variables are interdependent but have situational complexities that are often hard to predict.

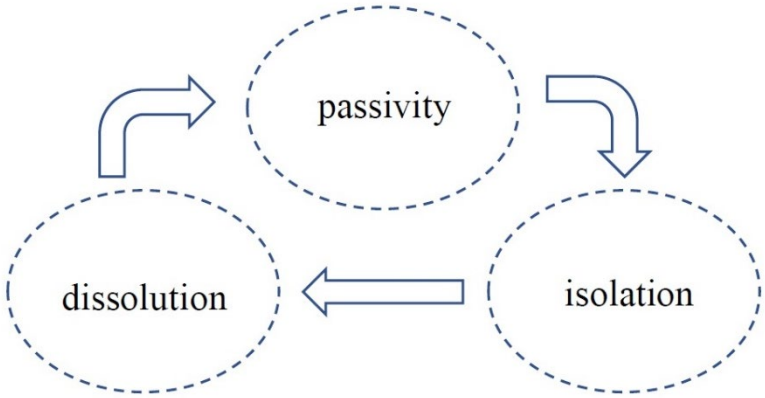

Figure 1. ERT learner cycle

Within an ERT environment, the very nature of designing means that the individual process remains active. However, the challenge of this dislocated context often results in the collective developing passivity. We believe this is because the ability for both learner and lecturer to respond to the design process in real time is severed. This discourse is fundamental to architectural studio pedagogy, as illustrated by Schon's concept of 'reflection-in-action,' which he describes as the language of doing architecture.[6]

The accumulation of this fractured environment results in a wholly passive critique experience. Although this may be occurring in real time, it lacks authenticity. The inability to read and respond to gestural cues from reviewer (judge) and audience in this unfamiliar territory leaves the presenter (learner) feeling the impact of both physical and social isolation. This is amplified by the intangibility of the studio collective.

Reflective observation of the two modes of delivery, both onsite and online, identifies the significant impact of locality and physicality on situated learning.[7] The ability to cultivate critical learning via peripheral participation [8] is key to both knowledge acquisition and developing professional behaviours. The ERT mode of delivery quite literally removes the periphery, that is, the ability to learn from others within proximity.

In our experience, the resultant outcome of passive participation in an ERT context poses a tension with our teaching ideology, which is active, dialogic and learner driven. In contrast, sessions become heavily reliant on the lecturer to generate discussions and instigate momentum. The very nature of passivity is driven by an unwillingness, or inability, to act, and is often systemic and habitual. The complexity with this issue is that strategies employed to overcome this condition in a typical classroom scenario (whether that is face-to-face or remote) do not apply to the ERT model.

While we cannot genuinely discuss the impacts to the design process in terms of collective participation within the scope of this paper, we do offer insights into a radical shift in the approach to critique. It is also useful to note, and fundamental to the issue of unparalleled change, that at the core lies a lack of resilience within the learner cohort. This highlights the need to embed opportunities to cultivate self-driven learning behaviours. Although we see many issues with the ERT model from a teaching and learning perspective, we also see a genuine opportunity to address the power imbalance that typifies critique practice. Findings suggest the opportunities for creative discourse and development are critically amplified through this methodology. Re-aligning the crit as an experiential learning opportunity within the pedagogical approach empowers the learner to take action and make meaning, shifting the context from passive to active.

CRITIQUE

It has been a long-established condition of architectural design education to expose learners to varying degrees of rigorous critical feedback, and design projects traditionally culminate with a formal design jury critique whereby learners present orally to a review panel, with drawings and models as supporting evidence. The crit offers the learner the potential to promote self-learning and generate or instigate criticality, however there is tension that exists within this procedure that examines (summative) product over real measures of a learner's accumulative knowledge (design process). This is most evident in the more formal critique strategies, namely the design jury. Tucker & Beynon suggest that this type of environment only serves to diminish potential learning opportunities, due to an inherent power imbalance which places learners in a vulnerable position and incites fear and anxiety.[9] We believe this is due to multiple factors such as the physical setup, in which the presenting learner is isolated and exposed as the centre of attention; the inherent knowledge disparity between the presenter and the reviewer, who is generally an industry expert or senior faculty member; the inactive peripheral participation of the attending learner body; and the focus on review as a defence of the final outcome, rather than a discussion of key learnings. Despite the various manifestations that crits can embody, we believe that the fundamental power imbalance lies at the core of the issue, and research suggests that any review process that engages in power play attributes, diminishes the real potential for learning to occur as the environment is still charged with an imbalance.[10]

Interestingly, teaching studio in an ERT mode provided the catalyst for addressing this imbalance and re-framing critique practices in our studio environment. As reviewed, our learners became passive participants very quickly; this forced a pivot in how critique was approached. Recognising that a

summative critique was irrelevant in an ERT context, we then shifted our attention to designing a formative, interim critique forum that placed the learner at the centre.

Learners curated and pre-recorded short presentations discussing key ideas and elements within their project. This became an effective exercise in reflective practice, as evidenced through their demonstration of critical rigour and selection of key images to support their discussion. At the point of submission, the presentation itself became an artefact, an archival record of progress at a given time. Recognising that this occurred mid-way through the project limited the pressure to achieve perfection and allowed for an authenticity in that learners were focusing their discussion on process, not product.

Feedback was also approached as a learner-centric activity, which was facilitated by the lecturer but actioned by the collective via small groups. As a class, learners developed a simple framework for giving feedback to their peers, with guidance from the lecturer, focused around highlighting quality, prompting clarification, and instigating direction. The critique process thus became activated, and learners and lecturer contributed to the giving of feedback as equal participants. The immediacy of this response provided a platform for learners to evaluate feedback and instigate further iterations. This, in essence, closed the loop of critical feedback that is often left unable to be addressed following summative critique.

This responsive shift to viewing critique as process (active), not product (passive), allowed for a broader and more inclusive review of learning opportunities through the medium of critique across our three-year degree programme. This aligns with research that suggests, to make the forum of evaluation and feedback (crit) more conducive to learning, the shift from presentation to dialogue needs to occur,[11] a collaborative process between 'giver and receiver.' Dialogue, therefore, is not mutually exclusive, but a reciprocal relationship that embodies reflection-in-action.[12]

RE-FRAMING THE CRIT

The critical review process, as practiced traditionally, has limited benefit to improving learner outcomes.[13] This is amplified in that it is generally a standardised approach, rather than a curated learning experience that is aligned to learning objectives and skill levels. The transformative skill that we see of value, and that must be embedded in all critical review practices, is critical thinking. Critical thinking is the ability to draw on information, make reasoned judgements and evaluations, and synthesise into a robust outcome.[14] Within an architectural design context this speaks to the iterative design process which culminates in a well-considered, resolved design response.

While we recognise there are conflicting views on critical thinking as a taught skill,[15] we believe that through careful scaffolding this can be achieved. We assert that, whilst critical thinking is highly transferrable as a skill, the practice of it requires specialist knowledge of a given subject area.[16] Our approach to fostering critical thinking is implemented in three stages, using critique as a vehicle. Stage 1, which occurs in Level 5 (year 1) of our degree programme, is centred around normalising critique as a practice. This occurs through the introduction and correct use of architectural language to build a holistic understanding of architecture as drawn, experienced, described, and communicated space. Embedding critique informally throughout the course of a project, and not as a summative exercise, establishes an environment where critique is standard practice. Critique is assimilated, and the value of it is intrinsically realised. Stage 2, in Level 6 (year 2) of our programme builds on this foundation, as well as the established CoP, allowing for formalisation of more structured critique. To align with our philosophy, this is learner-centric in its approach, and is demonstrated through multiple methodologies including critical self-reflection and peer review. This is the stage at which learners build capability in not only receiving, but giving, feedback. Reciprocal feedback is utilised as a mechanism for self-reflective learning, within controlled parameters. Stage 3, aligning with Level 7 (year 3), focuses on establishing a professional context for our learners, within the framework of an independent learning environment. Within a pseudo-professional context (the studio), the expectation

of our learners at this stage is to demonstrate critical thinking as an applied practice. This is revealed through self-initiated projects whereby the learner has become the expert, and the lecturer assumes a supportive role. Critique thereby becomes truly dialogic.[17]

CONCLUSION

The iterative design process typically culminates in a physical outcome (product), which is then examined through critique, instigating a studio environment that is authoritative rather than collective. Our pedagogy is centred around the design studio as a collective, co-operable learning environment. Any instance that challenges the collaborative, social nature of the studio poses a tension with establishing a learner-centric framework. For us, this disrupts the reciprocity of knowledge transfer characterised within the iterative design process, as learners transition from active participants to potentially passive bystanders. The social impact of passive behaviours in a design studio environment can be characterised by an altered degree of conscious involvement, a psychological cognitive distancing and a transgression into vulnerability and dissolution of the collective (refer to Figure 1).

Understanding the enforced changes to teaching strategies instigated by shifting to an emergency remote teaching (ERT) platform has provided insight into how significant the physical domain is in relation to establishing an environment where criticality from self and others informs all aspects of professional behaviour. Our learners demonstrated a fragility in maintaining a connective presence within an intangible studio context. This disconnection was exacerbated by the diminished ability to respond to learners perceptively due to the resultant effects of the cycle of passivity, as outlined in Figure 1. Learners' lack of willingness to participate collegially in group sessions triggered a reversion to more teacher-led styles of facilitation.

Whilst the exceptional circumstances that characterize ERT posed significant challenges, they also highlighted the importance of the critical review process as a catalyst for reinstating active participation within the learner cohort. 'Critiquing the crit' enabled us to identify the learning opportunities associated with critique practices, irrespective of teaching mode, and re-align teaching strategies to ensure these opportunities are embedded appropriately. Critique is viewed as a process, as opposed to a product, or isolated event. We see the value for deeper, more transferrable learning through this lens, specifically in terms of developing critical thinking. This methodology is implemented through a staircased approach across the three-year programme, with consideration for both learning objectives and expected criticality at each level. The intention is to foster the development of independent, resilient learners, who possess the capabilities to utilize reflective practice as a highly transferrable, applied skill. Assimilation of critique as a practice means that critical thinking is implicit, not explicit, thereby supporting our view that learning should be dialogic and collaborative. Further evaluation of this re-framed perspective poses a question: If we teach the process of critique through a series of active learning experiences, does the crit, as a form of summative examination, become redundant?

NOTES

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CASUAL ACADEMICS AND STUDIO TEACHING IN FACE-TO-FACE AND ONLINE FORMATS

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INTRODUCTION

In response to the COVID-19 pandemic, academics who teach design hastily 'relocated' architecture's signature[1] studio pedagogy into online formats. They worked from home with basic and often inadequate technology and support, facing internet connectivity issues and dealing with physical and social distance from students and their shared materials (physical drawings and models). This research explores perspectives of casual academics teaching design in both face-to-face and synchronous online formats at five Australian universities. In architectural education in Australia, casual academics make up to 77% of the academic workforce.[2] They are known as tutors in the design studio and include registered or unregistered practising architects and doctoral/masters' students. Within the prevalent apprenticeship model of teaching and learning in architectural design education, tutors' relationship with students undeniably encourages learning and engagement. This paper posits that tutors are primed to 'relocate' their teaching practices into online formats due to their readiness to improvise and ability to adjust their affective and pedagogical communications to the needs, abilities, attitudes, and approaches to learning of diverse learners. The paper discusses the opportunities and challenges that the 'pandemic moment' presents for architectural design education.

Architectural design education

According to Donald Schön, it is through 'joint experimentation' in design studios that coaches work closely with students. They employ combinations of words, moves, and demonstrations to reflect-in-action or 'in the midst of' teaching.[3] Schön's theorization resonates with the lived experiences of tutors and legitimizes studio teaching and learning practices, providing a rationale for the master-student relationship. However, it is critiqued for being limited to cognitive aspects, having a narrow view of modes of learning, not recognizing the intertwined nature of individuals agency and contexts, and through the portrayal of teacher as coach perpetuating hierarchical power dynamics. Keeping in mind these critiques of Schön's theory, this paper expands understanding of design teaching practices.

Methodology

This study employs practice theory methodology to investigate the studio teaching practices of tutors. The 'theory of practice architectures' offers a comprehensive view of design teaching practices as comprising of cultural-discursive, material-economic, and social-political arrangements. The cultural-discursive arrangements include knowledge and language employed in the design studio and are characterized by 'sayings' or deployment of language and taken for granted understandings of the

disciplinary discourse. The material-economic arrangements are enabled or constrained in the activities or characteristic 'doings' within the environment of the design studio, including the layout of studios and classrooms, available resources, hiring practices of casual academics and changed student demographics. The social-political arrangements of practice include 'relatings' or relationships between people and things and hence power dynamics. This conceptualization views practices as comprising of 'sayings, doings and relatings' which 'hang together' in a characteristic way. Practices are guided by a teleo-affective dimension wherein 'teleo' implies that practices comprise of a set of specific actions and appropriate 'affective' or emotional aspects. Not everything or anything goes in practice. Practices must follow general rules and be intelligible to others and are a performative understanding of reality. Practices have a collective and normative nature, which constitutes/reconstitutes them.

Methods

Qualitative research methods include observations of teaching in design studios including video recordings, fieldnotes and spatial mapping; semi-structured interviews; and focus group discussions. Observations of tutors' actions provides a baseline for understanding behaviors of casual tutors in design studios. The study provides an architectural lens and a unique method for 'situated' observation of behaviors that considers the educators and the spaces in which they work. Interviews and focus group discussions help to understand tutors' conceptions of design, designing, and studio teaching in physical and online settings.

Participants

36 casually employed tutors at 5 universities in Australia participated in the study [The names of participants are anonymized]. There were 21 (58%) male and 15 (42%) female tutors. 26 tutors were practising architects of whom 17 (47%) were registered practitioners and 9 (25%) were not registered, and 10 (28%) were doctoral students (Figure 1a).

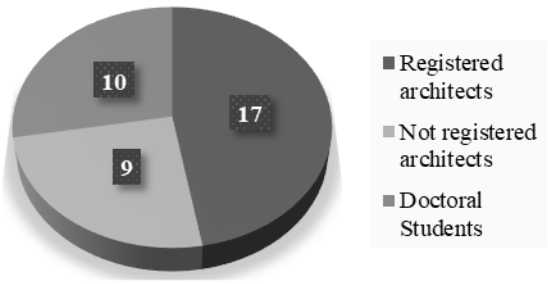

Figure 1a. Category of casual tutor participants.

16 (44%) tutors had 2-15 years of studio teaching experience, 14 (39%) had under 2 years of studio teaching experience, 2 (6%) were teaching studio for the first-time but had experience teaching other subjects (history, construction), and 4 (11%) had no prior experience of studio teaching (Figure 1b).

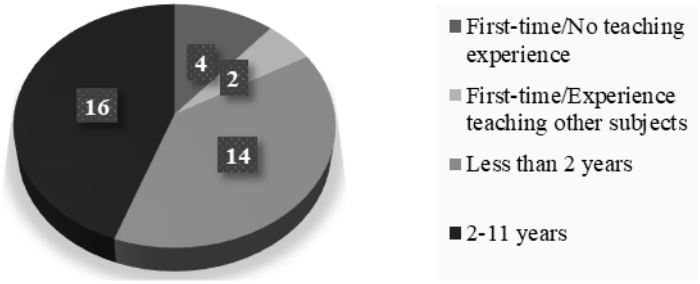

Figure 1b. Studio teaching experience of casual tutor participants.

THE STUDY

Physical design studio

Tutors' conceptions of roles

Tutors described themselves as 'regular' and not 'starchitects' who are established practitioners and have an extensive portfolio of projects. They viewed their role in architectural education as molding future professionals and helping students bridge between education and profession. They saw themselves as: (i) role models showing students "how to act professionally"; (ii) more experienced professionals because they knew about "the design process and had work experience"; and (iii) facilitators who provide support and "help tailored specifically to each student". Tutors noted that they teach a way of thinking and learning with peers, familiarize students with the design process, and teach skills such as critical thinking, problem-solving, and effective communication.

Tutors' conceptions of design teaching

Tutors described design teaching as providing "critique on demand"; "responding to" diverse learners based on their abilities, attitudes, approaches, and needs; and "explaining on the spot" through "nudging, telling, showing, directing, not dictating, being firm, making students feel comfortable and pushing students out of their comfort zone".

...how they [students] respond to me when I talk...if there's an understanding there or not, that's probably the biggest feedback...just seeing if they are engaging with what I'm saying. If they're not, then that's not the right thing...testing it out on them... (Brook, not registered architect, first-time teaching).

Design teaching practices in physical studios

The design teaching practices of tutors are a matrix of verbal, nonverbal and tacit aspects (Fig. 2).

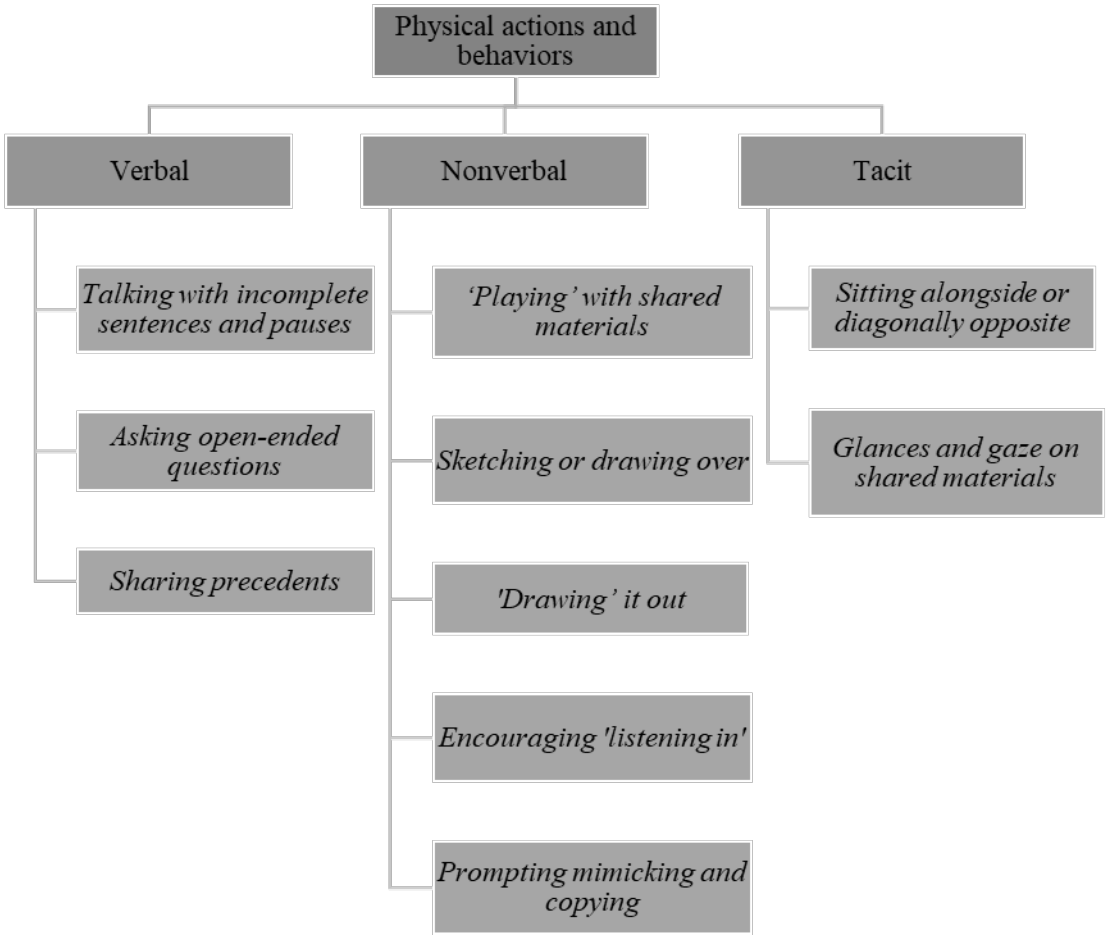

Figure 2. Actions and behaviors of tutors in physical studios.

Verbal practices: Tutors verbal practices include talking with incomplete sentences, asking open-ended questions, and sharing precedents (examples of built and unbuilt projects). These practices encourage students to externalize their thoughts and ideas. For example, during a one-on-one desk-crit discussion, as a student described her project using a large study model, the tutor paused briefly, picked up a study model and said, "I propose that…I propose…" During the pause the student chimed in and said: "This…I find this…interesting…" and proceeded to verbalize their ideas.

Nonverbal practices: Tutors nonverbal practices include: (i) 'playing' with shared materials; (ii) sketching/drawing over to encourage students to externalize through drawing; (ii) 'listening in' to discussion with peers; and (iv) prompting mimicking and copying.

(i) Tutors used models as props and 'played' with study models or arranged/rearranged models to demonstrate the iterative design process (Fig. 3). For example, when a student who said that she was stuck, the tutor said, "Let's try this together…" and began to rearrange the models while prompting the student to reason out why she 'liked' a particular arrangement and make design decisions. When the tutor moved to discuss with another student, this student continued to 'play' with her study models.

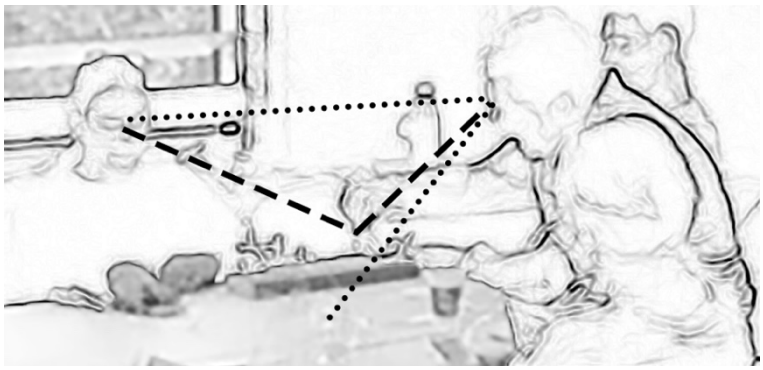

Figure 3. Tutor Eli (right, center) 'playing' with a student's (left) study models and rearranging them.

(ii) Tutors demonstrated how to externalize by sketching over students' physical drawings. For example, a tutor sketched on a piece of tracing paper overlaid on the student's drawing as they discussed movement, circulation, and organization (Fig. 4a). The student tilted his head sideways and said, "I just can't draw that well". The tutor made brief eye contact, then pointed to his own drawings and said, "Look at these…chicken scratches…you have to draw to convey your ideas". About two-thirds of the way into the discussion, the student reached out to take the sketch pen from the tutors and began to draw on the same tracing paper (Fig. 4b).

Figure 4a and b. Tutor Yani (left) 'sketching over a student's (left) drawing. After a while, the student sketched over the same paper to externalize his ideas.

(iii) Tutors encouraged students to work in the studio and 'listen in' or 'eavesdrop' on discussions with other students while working on their own projects. For example, a student from another tutor cohort stood while he discussed with a group of students speaking in their common first language other than English while the tutor discussed nearby with another student (Fig. 5a). After a while, the student pulled up a chair and moved closer to listen in. The tutor looked up for a moment and continued the discussion (Fig. 5b).

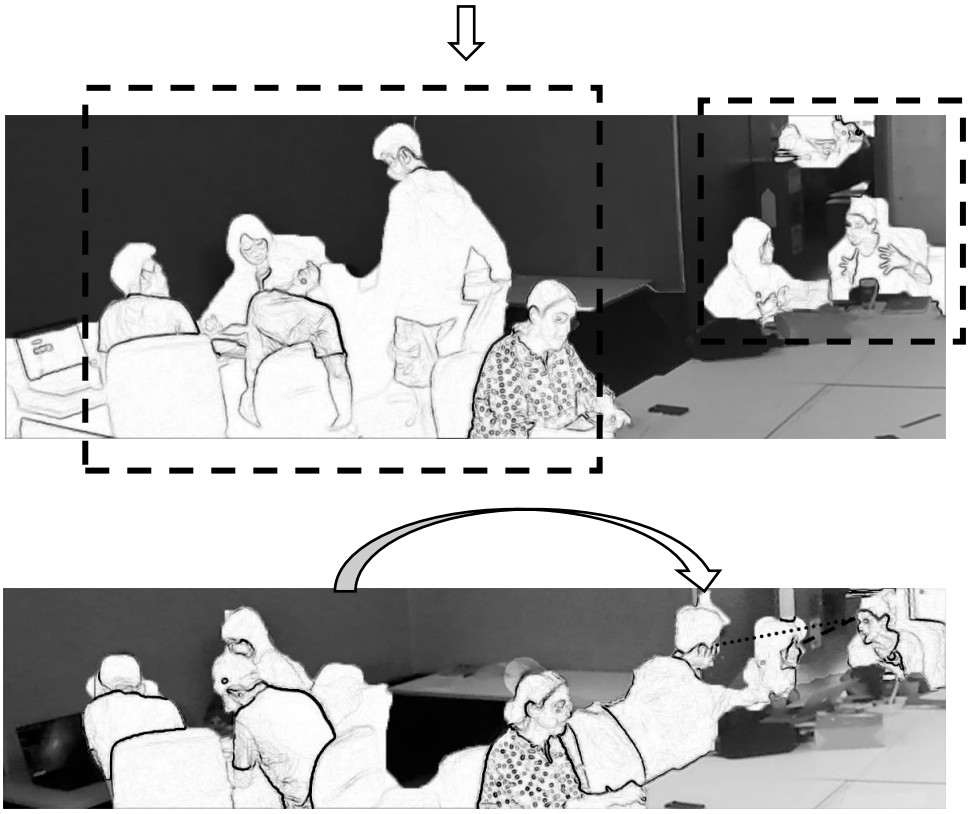

Figure 5a and b. Tutor Brook (right) discussing one-on-one with a student while a group of students (left) discussed their projects. After a while, one of the students from the group move to 'listen in'.

(iv) Tutors acted as role models by prompting mimicking and copying. For example, a few minutes into a discussion, the tutor picked up a small study model, tilted her head and gazed through it (Fig. 6a and b). When the tutor handed the model back, the student turned it, closed one eye, and gazed through it in a similar manner. In another studio, a pair of students provided feedback to one another using words and gestures employed by their tutors and mimicked or 'rehearsed' professional and learning behaviors (Fig. 7a and b).

Figure 6a and b. Tutor Brook (right) lifted a study model, tilted their head, and glanced through it. After a while, the student mimicked the tutor's actions.

Figure 7a and b. Two students took turns to discuss their projects. They used words and gestures used by their tutors and mimicked their actions and behaviors.

Tacit practices: Tutors tacit practices include sitting alongside or diagonally across from students and exchanging brief glances while directing attentiveness to students shared materials. Tutors typically sit alongside (Fig. 6) or diagonally across (Fig. 3, 4 and 5) from students during one-on-one desk-crit discussions. Tutors' position with respect to students meant that they did not face each other, and their attention was directed primarily towards materials shared by students. Therefore, eye contact was flexible and was deployed to convey messages that are persuasive, reinforcing and/or censoring. It helped tutors gauge attitudes, approaches and understanding of diverse learners' and then provide 'tailored' feedback.

Employing practice theory methodology, tutor's design teaching practices in the physical studio can be conceived as involving:

Forgetting: Natural and momentary pauses during design conversations or 'forgetting' invites students to 'fill-in' and co-construct knowledge. It represents the cultural-discursive 'arrangements' including what is said and how it is said.

Positioning: Tutors employ positioning to establish a sense of partnering and negotiate the power dynamics inherent in the student-tutor relationship. Tutors' positional management are 'doings' and 'relatings' or material-economic arrangements including what is done, how it is done, and the setting where activities occur.

Postures and body movement: Tutors expressed a sense of understanding about what students are going through and assumed mirroring postures or employed body orientations to display similarity and/or authority. Tutors' displays of power and agency through postures and body movements are 'relatings' which include ways of demanding or coaxing interaction.

Storytelling: Tutors highlight the importance of having a library of precedents and the ability to access "relevant examples quickly" during discussions with students. Verbal descriptions and speculative and exploratory markings have agency and are a way to demonstrate the design process. Storytelling represents the cultural-discursive 'arrangements' which includes what is said and how it is said. Storytelling also consists of 'doings' which are material-economic arrangements through activity, including what is done, how it is done and settings where such activities occur.

Eye contact and attentiveness to shared materials: It allows tutors to gather cues and gauge diverse learners' attitudes, approaches, attitudes, and understanding and provide 'tailored' feedback. Tutors gaze was primarily directed towards students' shared materials. Tutors use eye contact and gaze to

build perceptions of themselves as role models, more experienced and knowledgeable experts, facilitators. Such behaviors are social-political arrangements includes ways of relating and displays of power and agency.

Online design studio

Tutors' conceptions of changed roles

Tutors teaching online saw themselves as "mentoring…directing and guiding students" "through questioning, suggesting alternative points of views and [sharing] precedents", teaching students to think creatively, and facilitating to provide a "positive and engaging [studio] environment" to keep students "motivated and engaged" in the online setting. They saw their role expand and/or heighten as "sympathetic pastoral carers". Tutors were sensitive that in the online studios "students may feel exposed when speaking about their work" because the format "draws attention to the individual [in a group setting rather than one-on-one as in the physical studio, making students] feel unsure or uncertain…embarrassed".

Tutors' conceptions of teaching design online

Tutors highlighted that the online format does not replicate the physical studio experience. As discussed earlier, in the physical studio tutors tailored feedback to diverse learners using verbal (conversation), nonverbal (on the spot explanatory sketches), and tacit means (eye contact). Tutors found online studios to be "more didactic and physically restrained". Tutors were unable to:

…express with gestures and movement…[which] are integral to how we communicate and hopefully imbue enthusiasm for design (Casey, registered architect, more than two years of design teaching experience).

Tutors noted that conversations did not "flow". They had to take turns and "listening became key to understanding student's absorption of what was said and demonstrated" and they needed to "coax" students to "participate and minutely direct the tutorial activities to keep the momentum going". They did so by:

…focusing on vocal clues such as tone of voice, pace of the discussion…for example, if…the student circling and repeating needlessly or rushing and glossing over critical issues…Listening is far less intuitive than looking for nonverbal clues and requires a different [teaching] strategy (Casey, registered architect, more than two years of design teaching experience).

Tutors found it difficult to "gauge students' reactions" which was compounded by limitations of technology as some students could not turn video cameras on due to poor internet connectivity. Furthermore, tutors sat directly across and did not have the flexibility to position themselves alongside or diagonally across from students. They noted that the face-to-face position demanded eye contact and directed attention to shared materials. Often students were "not eager to turn on their cameras" due to feeling embarrassed to share their work in progress in front of the whole class. However, some tutors articulated that promoting peer learning or 'listening in' was easier as public nature of the online:

…platform allowed students to be both introspective of their own work…having to select [and share] images that define their work…and outward looking at other students' progress, was very helpful (Gene, not registered architect, less than two years of design teaching experience).

Tutors' online design teaching practices

Tutor's design teaching practices in the online studio involves:

Taking turns: Tutors exchanges and interactions with students are sequential instead of reciprocal talk (which in physical studios enables chiming in during pauses). Taking turns made for awkward

silences requiring calling upon students to engage and externalize, which put them on the spot or made them feel singled out.

Heightened/diminished storytelling: Due to easy access to the internet, sharing precedents which includes verbal and visual storytelling expanded to include a wider range of projects. However, nonverbal storytelling via sketching over student's drawings was restricted due to basic digital tools and technology (only one tutor had access to a tablet). Physical models could only be shared by holding up to the camera or sharing videos. Despite the moving image, the two-dimensional format made it challenging to provide feedback on concepts such as scale, massing, and volumetric relationships. It was challenging to get students to externalize nonverbally on the spot through sketching due to basic digital tools and technology. Furthermore, due to limited ability to use of postures and body movements, nonverbal storytelling was restricted.

Disrupted informal peer learning but increased opportunities to 'listen in': The online format disrupted informal peer learning which is a signature feature of the physical studio and pedagogy. However, the breakout rooms and the group format provided some opportunities to 'listen in' to peers.

Changed dynamics of role-modelling: Tutors ability to role-model learning and professional behaviors changed significantly. In physical settings, tutors' persona, actions, and interactions are on display, but the stationary position of the tutor in online formats limits their presence and choreography as professional role-models.

CONCLUSION

The pandemic has foregrounded questions about the importance of studio spaces to studio pedagogy and how or whether design can be effectively taught online, particularly without cues from physical behaviors of students and without the ability to hold and interact with students' in-progress shared material representations. One of the primary tensions that exists between traditional face-to-face and online studio formats is that while traditional studio contexts are considered as delivering knowledge and providing an opportunity for modelling professional attitudes and behaviors, online settings are viewed to facilitate reflective and blended learning and peer interaction and group collaboration through focus on technology and online teaching tools. Changed communication modalities and mediation of interaction through technology has not only shifted the studio setting but has also altered the signature pedagogy. The reliance on traditional 'chalk and talk' style learning environments (such as Blackboard, Blackboard Collaborate Ultra, Microsoft Teams and Zoom), highlights the challenges of translating face-to-face practices. It begs the question can design be taught effectively online, what kinds of environments and formats are required and how can technology support interactions that provide behavioral cues which are so crucial for studio teaching. The 'pandemic moment' has presented an opportunity to interrogate the 'socially distanced' formats and modes of interaction in architectural design and ask whether, besides the obvious digital equivalents, there may be new practices, technologies, strategies, and skills that can replace and/or complement face-to-face interactions. The accommodations and adjustments tutors make to foster an empathetic online studio environment demonstrates how studio pedagogy can adapt to the synchronous online format.

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THE COVID DISRUPTION IN INTERIOR DESIGN EDUCATION/VIRTUAL REALITY

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INTRODUCTION

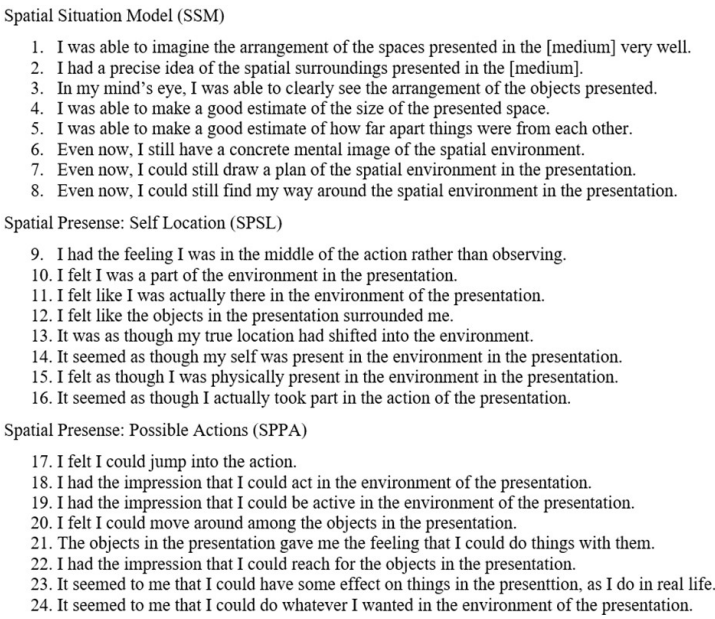
The disruption of COVID resulted in a radical alignment in the pedagogy of studio courses in interior design education. Though physically distanced, interior design instructors adapted, including a shift in the virtual reality (VR) utilized for students to self-critique their own projects. This shift was from VR headsets to 360-degree viewing, in an attempt to fill the gap where the VR headset was removed. The Council for Interior Design Accreditation (CIDA) requires instructors and students to incorporate the use of virtual environments in their learnings. This proposed study will use two data analyzation techniques. First, it will use a Multivariate analysis of variant (MANOVA) to determine if there is a statistically significant difference between the VR headset and the 360-degree viewing. Second, it will apply the Virtual Reality Spatial Presence Index (VRSPI), to define the strength of the perceived spatial presence of the VR headset and the 360-degree viewing. The study population will be 100 interior design students and will take place in Fall 2022. The results will be reported in Spring 2023.

The challenge is that in March 2020, only essential workers were allowed back on Eastern Michigan University's campus, due the threat of COVID-19. Prior to this disruption, interior design studio instruction included use of Virtual Reality (VR) headsets for interior design students, to immerse themselves in their own designs, as a form of student self-critique. With this university campus shutdown, using VR headsets for interior design students was not an option. With the pandemic pushing an immediate switch to online interior design studio instruction, university instructors sought an immediate alternative to that VR headset, to prevent a pause in instruction. As an alternative, interior design students created 360-degree views in attempt to fill the gap where the VR headset was removed. For the purpose of this study, the definition of Virtual Reality is a means of creating the illusion that we are present somewhere we are not.

Spatial Presence

The theoretical framework of the Model of Spatial Presence was defined by Wirth et al. and defined Spatial Presence as "a binary experience, during which perceived self-location and realization of action possibilities are connected to a mediated spatial environment; mental capacities are bound by the mediated environment instead of reality; and these conditions can be enhanced by different sensory input and action feedbacks but does not necessarily rely on them."[1] Meaning, how present do you feel in a virtual environment? Three of the variables offered are: Spatial Situation, Self-Location,

and Spatial Presence. These three variables form three sections of the Measurements, Effects, Conditions-Spatial Presence Questionnaire, [2] as illustrated in Figure 1.



Spatial Situation Model (SSM)

1. I was able to imagine the arrangement of the spaces presented in the [medium] very well.
2. I had a precise idea of the spatial surroundings presented in the [medium].
3. In my mind's eye, I was able to clearly see the arrangement of the objects presented.
4. I was able to make a good estimate of the size of the presented space.
5. I was able to make a good estimate of how far apart things were from each other.
6. Even now, I still have a concrete mental image of the spatial environment.
7. Even now, I could still draw a plan of the spatial environment in the presentation.
8. Even now, I could still find my way around the spatial environment in the presentation.

Spatial Presense: Self Location (SPSL)

9. I had the feeling I was in the middle of the action rather than observing.
10. I felt I was a part of the environment in the presentation.
11. I felt like I was actually there in the environment of the presentation.
12. I felt like the objects in the presentation surrounded me.
13. It was as though my true location had shifted into the environment.
14. It seemed as though my self was present in the environment in the presentation.
15. I felt as though I was physically present in the environment in the presentation.
16. It seemed as though I actually took part in the action of the presentation.

Spatial Presense: Possible Actions (SPPA)

17. I felt I could jump into the action.
18. I had the impression that I could act in the environment of the presentation.
19. I had the impression that I could be active in the environment of the presentation.
20. I felt I could move around among the objects in the presentation.
21. The objects in the presentation gave me the feeling that I could do things with them.
22. I had the impression that I could reach for the objects in the presentation.
23. It seemed to me that I could have some effect on things in the presenttion, as I do in real life.
24. It seemed to me that I could do whatever I wanted in the environment of the presentation.

Figure 1. Three variables for the three sections of the Measurements, Effects, Conditions-Spatial Presence Questionnaire

Council for Interior Design Accreditation (CIDA)

To support the reason for this research focus, note the the competencies taught in interior design curriculum, controlled by The Council for Interior Design Accreditation (CIDA), including virtual environments. Their purpose is to oversee that university interior design programs cover a common body of knowledge for the professional practice of interior design.[3] Their Standard #7b is titled Human Centered Design. In Standard #7b, the student work demonstrates understanding of "the relationship between the natural, built, virtual, and technological environments as they relate to the human experience, wellbeing, behavior, and performance." [4] Notice in that standard, the word virtual is incorporated.

Virtual Reality

For the purpose of this study, the definition of Virtual Reality (VR) is "is a means of creating the illusion that we are present somewhere we are not."[5] Some researchers report that VR "has mainly been included as a visualization tool to explore pre-designed ideas developed in traditional 3D software or using pen on paper."[6] The researchers are referring to VR use in the instruction of interior design students. Other researchers use VR for student self-critique.[7]

Previous Studies

One previous research study revealed technology acceptance was positively correlated with spatial presence capabilities (referring to virtual reality). A bivariate correlation was used. Simply put, this means for each incremental increase in the VR technology's spatial presence perceived capabilities, there was a .740 increase in student technology acceptance. [8]

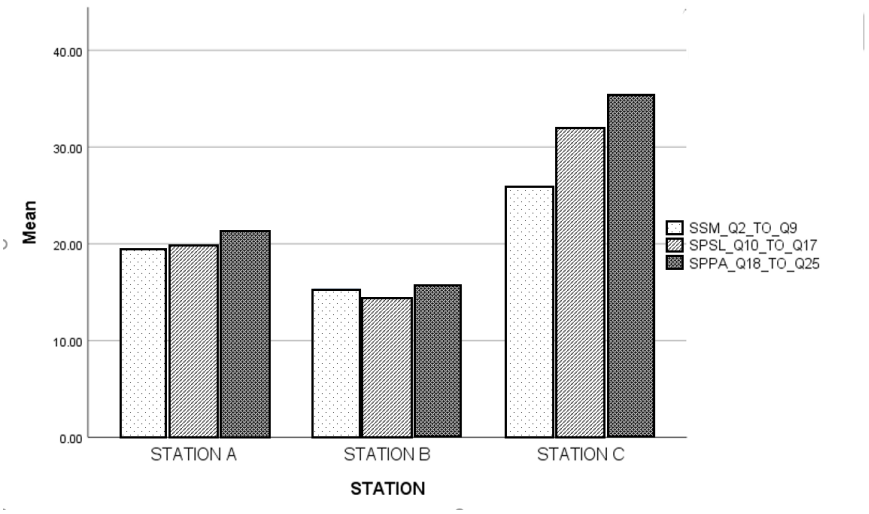


Figure 1. A statistically significant difference found between VR display formats

In another research study,[9] two analyses were performed. First, as illustrated in Figure 1, a multivariate analysis (MANOVA) revealed that a statistically significant difference was found between VR display formats. The independent variable was the VR display format (three types). The dependent variable of Spatial Presence has 3 sub-variables. The statistically significant differences were found between:

So, between the display C and two other VR displays A and B, in two out of the three dependent variables.

1.Display C and the VR displays A and B: Spatial Presence: Self Location (SPSL) P reported at (p = .176).

2.Display C and the VR displays A and B: Spatial Presence: Possible Actions (SPPA) (p = .190).

Note threshold set at (p < .001), a p value of 0.1 meaning there is 1% chance that the results are due to random chance, as illustrated in Figure 1.

In this forementioned study, as illustrated in Figure 2, the second analysis performed was an application of the Virtual Reality Spatial Presence).[10]

1. Station B (M = 119.82), therefore a VRSPI of 4 or *slightly strong;*
2. Station A (M = 107.45), therefore a VRSPI of 3 or *neither strong nor weak;*
3. Station C (M = 75.33), therefore a VRSPI of 2 or *slightly weak.*

Hence, this VRSPI would indicate the strongest spatial presence capabilities in Station B (*slightly strong),* followed by Station A (*neither strong nor weak),* and then weakest in Station C (*slightly weak).* In conclusion of these previous studies, combining the study results supports the hypothesis of VR display format "Station B" as the most capable option if a VR display format needs incorporated for student use in an interior design curriculum.

Background Conclusion

With CIDA requiring the student use of virtual environments, supported by previous studies evaluating VR display formats, there is a need for continuation of the research evaluating VR display formats as it is an emerging technology. Past studies clearly found differences between VR display formats, including For the purpose of this study, the definition of Virtual Reality (VR) is "is a means of creating the illusion that we are present somewhere we are not."[11] Some researchers report that VR "has mainly been included as a visualization tool

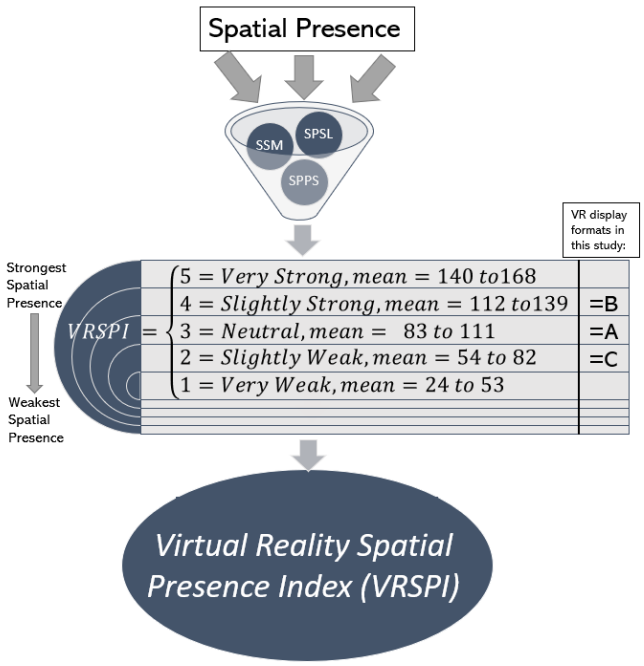


Figure 2. Virtual reality spatial presence index (VRSPI) applied to VR study

Hypothesis

It is hypothesized that the 360-degree viewing display, utilized during the March 2020 COVID shift to online interior design instruction, IS as effective as the VR headset teaching tool utilized during in-person interior design instruction (regarding perceived spatial presence).

METHODOLOGY

The proposed study will take place in Fall 2022 with a sample population of 100 interior design students. This will be conducted at a midwestern United States university. This study will collect the data using the MEC_SPQ questionnaire by Vorderer et al.[12] This questionnaire is a pre validated survey rooted in the Model of Spatial Presence (MSP) by Wirth et al.,[13] with Cronbach alpha scores range from 0.86 to 0.91.

Data Analyzation

This proposed study will use two data analyzation techniques. The first data analyzation will use a MANOVA to determine if there is a statistically significant difference between the VR headset and the 360-degree viewing. The second data analyzation will apply the Virtual Reality Spatial Presence Index (VRSPI), to define the strength of the perceived spatial presence of the VR headset and the 360-degree viewing. The VRSPI strengths are on a five-point scale and range from *very strong* to *very weak*,[14] as illustrated in Figure 2.

CONCLUSION

This study will contribute to the body of knowledge for interior design education and for the Council for Interior Design Education's (CIDA) continual purpose of ensuring that university Interior Design programs cover a common body of knowledge for professional practice of interior design. With the emerging technology of virtual reality (VR) being introduced into interior design university curriculum, disruptions such as the COVID-19 pandemic caused a shift in interior design education. The disruption caused a shift to immediate online instruction and the instructor and technology tools attempted to adapt and likewise shift. With the goal of supporting CIDA's purpose, this study will

provide feedback on whether the adaptation of shifting to 360-degree viewing was as effective as the VR headset teaching tool utilized during in-person interior design instruction (regarding perceived spatial presence). Study results will be reported in Spring 2023.

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