

Gameful civic education: A systematic literature review of empirical research

Isabella Aura¹, Lobna Hassan¹ and Juho Hamari¹

¹ Tampere University, Kanslerinrinne 1, 33014, Tampere, Finland

Abstract

Gameful approaches to learning have gradually been established as the go-to rhetoric when attempting to increase engagement with learning. This has especially been the case in educational activities that have long-term missions or teach abstract concepts, such as life skills, communal tolerance, or civic education at large, where there exist several pedagogical challenges in making the context meaningful to the youth. However, currently there is no clear overall view on what kind of gameful affordances are utilized in teaching these subjects and what are their reported impacts. To investigate the state-of-the-art of this corpus, 36 empirical papers were identified and systematically reviewed. The current literature, overall, draws quite an optimistic image of the benefits of game-based approaches in civic education. Most of the reported gamification designs included characters and roleplay, social aspects such as co-op and chat functions, as well as 3D worlds and game maps for students to navigate in. Furthermore, the corpus reported positive impact of gamification on learning in the context of civic education as well as positive impact on cognitive, emotional, motivational and social experiences and motivation. However, the lack of detailed descriptions of the exact attributes that facilitated these favorable shifts indicates a need for more systematic research to identify the long-term and transferable influence game-based approaches have on formal civic education and students' civic skills.

Keywords

Civic education; game-based approaches; systematic literature review; gamification; game-based learning

1. Introduction

Youth's understanding of and interests in communities, civics and citizenship are necessary for the democratic and constructive development of societies and more immediately to individual adult thriving as part of society. Hence, families and school's civic education programs often attempt to gradually build young people's civic engagement throughout their lives, with the aim of creating opportunities for children to act in their current social realities. Societies, i.e., the social systems, are complex and intricate socio-economic-cultural structures that set the context where individuals act out their lives. Therefore, the study of societies function and how individual may arrange their live within them is of crucial

important for individual beyond other theoretical and practical education schools provide. Moreover, there are rising concerns about growing socio-economic problems in the world [1], a lack of trust in democratic processes [2] and negative civic engagement (e.g., extremism [3]) amongst other concerns, which, collectively, have required the attention of both educational professionals' and policymakers' during the past few years. These problems are amongst the biggest threats to peace, democracy and tolerance, and signal that perhaps we need to re-examine our civic education activities. To address such issues, the European Union (EU) has commissioned nations to promote citizenship education and to stress its importance at all levels, from primary school to university and beyond [4]. The United

6th International GamiFIN Conference 2022 (GamiFIN 2022),
April 26-29 2022, Finland
EMAIL: isabella.aura@tuni.fi (A. 1); lobna.hassan@tuni.fi (A. 2);
juho.hamari@tuni.fi (A. 3)
ORCID: 0000-0001-9540-710X (A. 1); 0000-0002-6201-9159 (A.
2); 0000-0002-6573-588X (A. 3)



© 2022 Copyright for this paper by its authors. Use permitted under Creative Commons License Attribution 4.0 International (CC BY 4.0).

CEUR Workshop Proceedings (CEUR-WS.org)

Nations (UN) has, similarly, emphasized the importance of schools in promoting youth civic engagement [5].

Civics or citizenship education, as umbrella terms, are often considered to include teaching of not only civic skills, but also skills such as morals, critical thinking, problem solving or cooperation [6, 7]. Additionally, they can aim to educate students about governance systems [8], politics [9], globalization [10], digital citizenship [11], as well as global organizations, such as the EU and/or the UN [12] in affiliated nations. Hence, the range of topics for teachers to cover is wide and complicated. Generally, citizenship education is enacted through memorizing information related to history, geography, law, religion and common civic activities such as voting [13, 14], whereas civic education aims to equip students with skills and behavior suitable for collaborative and active member of community [15]. These programs may, however, differ greatly by country and local curricular requirements. The lack of established definitions for civics is perhaps strongly linked to the complex ecosystem of nationality and citizenship [16], raising philosophical as well as pragmatic questions of: what makes a “good citizen”, how to teach it and can it even be taught?

As part of schooling, civic and citizenship education can be approached as stand-alone subjects, cross-curricular dimensions or a combination of different approaches [4]. Regardless of the approach, the need for any form of civic or citizenship education is undebatable. Studies have shown that schools without citizenship courses and civic programs leave students in a disadvantaged position in their futures as workers and citizens, compared to peers receiving civic education [10, 17]. Additionally, it is no longer sufficient to teach about political systems or democracy without embedding global empathy, social justice and sense of common good in civic [16, 18]. Thus, citizenship or civic education should preferably teach both the theoretical knowledge and soft civic skills holistically for youth to be able to act in society for one’s own welfare and of others.

However, civic and citizenship education might often appear as a distant topic for children and youth, who perhaps see it as only adults’ concern [19]. Additionally, the programs might be highly theoretical and rely on mere memorizing [13, 14]. To promote active, practical and relevant civic engagement in formal education, teachers are increasingly implementing games and

gameful approaches into their teaching, in hopes to motivate young learners and present complex civic matters in a more approachable way [20, 21].

The interactive and experiential features, which are common in games, often foster engagement and creativity, and offer greater levels of activity than students would experience within traditional, teacher-centered teaching [18, 22]. Games can provide safe interactive learning environments that reveal the consequences of players’ decisions for multiple actors and for society, allowing for the exploration of ethical and societal principles in more complex and systematic ways than other media have allowed in the past [18]. Scholars have especially emphasized the importance of role play games in teaching, which allow collaborative negotiations, networking and experiencing society and citizenship from multiple viewpoints [18, 23–25]. However, integrating games in education may also induce detrimental outcomes, such as loss of performance [26], aggravate students’ mental workload [27], or promote antisocial behavior [28], thus, it is crucial to consider the desired aims and contributions before implementing games in any teaching.

As this area of research and practice remains relatively emerging, we need to further examine the use of games in civic education and their impact [16]. Hence, the aim of this study is to provide a systematic literature review of the existing empirical research on game-based approaches and its effects on civic education and answer the following questions: *What affordances (gamification designs) are used in game-based approaches in formal civic and citizenship education?* And; *What is the reported impact of these approaches?*

2. Methodology

To answer the outlined research questions, we conducted a systematic literature review of game-based approaches in formal civic education. The inclusion criteria tool SPIDER (Sample, Phenomenon of Interest, Design, Evaluation, Research type) was utilized to set up this study [29]. The sample focus of this study is research on minor students, from primary education to high school level (6–17-year-olds) due to authors’ interests in empirical classroom activities and to answer the need for further research [16, 18]. The phenomenon of interest is empirical interventions, programs and/or initiatives to promote and teach

civic(s) or citizenship, including e.g., civic engagement, as long as they contain a game or gameful feature and look into their effects. These gameful features may consist of, but are not limited to, features common to games [30], for example, levels, avatars, roleplay, and/or actual digital or traditional game. There was no inclusion criteria relating to time period or geographical location of the reviewed research. For design criteria, the paper should present an empirical study conducted in a formal educational context, such as a school. Evaluation may have been done using quantitative, qualitative, or mixed methods. For research type, any peer-reviewed and English written articles, conference proceedings and book chapters were considered eligible.

The literature search was carried out in Scopus in February 2021, using the query: (TITLE-ABS-KEY ((civic* OR citiz* OR sociali*) AND edu* AND (game* OR gami*))). The keywords game* and gami* include all forms of games, gamification, game-based methods and gaming. Keyword edu* was used to include literature about education and educating students. Keywords civic*, citiz* and sociali* narrowed the search on civic and citizenship education and, for example, political or democratic socialization. Before conducting the final query, exploratory searches were made to ensure that the keywords cover the relevant literature. Figure 1 illustrates the different stages of the literature search:

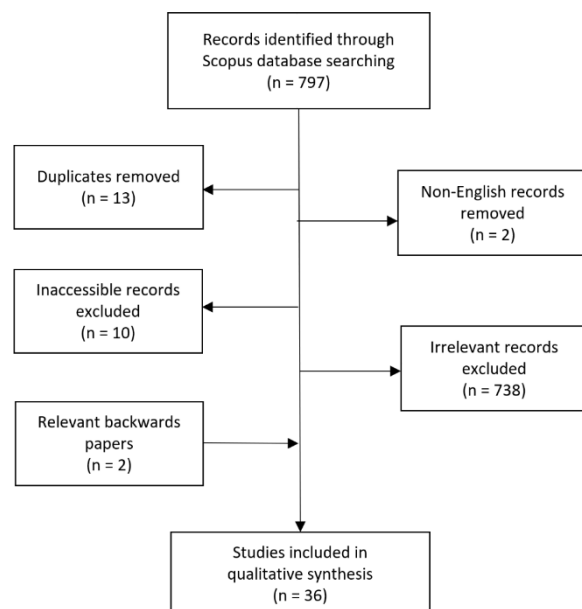


Figure 1: Search process

The literature search started with 797 identified papers. Two authors screened the titles and abstracts independently against the SPIDER

inclusion criteria. Duplicates (n = 13), non-English (n = 2) and inaccessible papers (n = 10), as well as irrelevant papers (n = 738) were excluded. Irrelevant papers had no empirical design (i.e., would not be able to infer about the effects of gamification on learning or related psychological constructs) or did not examine gameful approaches to formal civic(s) or citizenship education in schools with children or youth, leaving 34 records. Following backwards and forwards references search [31], two relevant papers were identified. In total, 36 studies were extracted by one author and two authors determined their final eligibility together. Extracted data included study characteristics (e.g., publication year, which were between the years of 2005 and 2021), participant characteristics (e.g., age group, which were between 6 to 17 years), study design (20 studies utilized mixed methods, 10 were quantitative and 6 qualitative papers), details of the intervention (e.g., affordances and aims) and study results. All authors participated in the process of qualitatively synthesizing the results. Potential bias was carefully considered throughout the coding process with experienced co-authors and any disagreements were resolved via discussions.

3. Results

3.1. Affordances in game-based approaches for civic education

This section presents the motivational affordances described in the reviewed studies. Table 1 summarizes the findings in 17 categories.

Table 1
Affordances in the reviewed studies

Affordance	Source	#
Avatars, characters, roles, roleplay	[6–9, 12, 20, 21, 32–54]	30
Co-op, teams, social networking, chat function	[9, 12, 20, 21, 33–36, 38–41, 43, 45, 47, 49–52, 55–58]	23
Game world, 3D world, game map	[7, 12, 33–36, 39, 42–44, 46, 48, 50–56, 58, 59]	21
Narrative, stories, storytelling	[6–9, 12, 34–36, 39, 40, 43, 46, 49–52, 56]	17
Challenges, quests, missions, quizzes, tasks	[6, 8, 12, 20, 43, 45, 46, 48, 49, 52, 58, 59]	12

Leaderboard, competition	[32, 34–36, 39, 42, 49–51, 58]	10
Levels, sections, phases, turns	[12, 34–37, 39, 46, 50, 51, 59]	10
Timer, time pressure	[34–36, 39, 49–51]	7
Assistance, helpers, guide	[6, 12, 20, 40, 48, 49]	6
Performance feedback	[20, 38, 40, 43, 48, 59]	6
Voting	[21, 38, 41, 47, 49, 57]	6
Score, points	[12, 32, 42, 45]	4
Badges, achievements	[12, 32, 42]	3
Virtual items, spending money or energy	[37, 38, 46]	3
AR technology	[46, 56]	2
Progress tracking and visualization	[8, 42]	2
Physical board	[60]	1

The majority of the employed game-based approaches in formal civic and citizenship education included avatars, characters or roles and roleplay for the students to use digitally or physically. Through the utilization of avatars or roles, students were often able to communicate or collaborate with their teacher or peers. Hence, the second most employed affordances were different co-op functions and other social dimensions. Many of the interfaces also included a chat function, where students could share ideas and discuss strategies during gameplay. The third most employed affordances were various 3D worlds and game maps, where students navigated their journey through the game. Along with a game world there often was a story or a narrative, altogether in nearly half of the reviewed papers.

Out of 36 papers, 12 studies described different challenges, tasks or quests in the gameplay. Competitive elements were reported in 10 studies, and the same amount employed various implementations of levels, sections or turns. Seven studies mentioned timers or time pressure. A guide or a helper, performance feedback and voting were each included in six papers. Only a few studies described the employment of points, badges or virtual items and goods, and even fewer had implementations of AR technology or progress tracking. Finally, solely one of the reviewed studies examined a traditional board game, which was designed by students for students with the aim of educating about community and civic values.

3.2. The reported impact of gameful civic education

In this section we detail the reported outcomes of the employed game-based approaches reported in the reviewed manuscripts. Table 2 summarizes the investigated outcomes within the framework for gamification outcomes [61, 62].

Table 2
Reported impact of the reviewed studies

Outcomes	Positive	Mix./null	Negative
Cognitive			
Learning outcomes (formally measured)	[20, 21, 32, 34, 35, 39, 41, 42, 47, 50–52, 57, 60]	[8, 32, 41, 58]	[32]
Learning outcomes (self-reported)	[7, 9, 21, 33, 38, 39, 43–46, 48, 49, 56]	[9, 48]	
Thinking skills	[6, 20, 35, 37, 39, 45, 48, 50, 58]	[6]	
Problem-solving	[6, 35, 38–40, 45, 48, 50, 58]		
Emotional			
Enjoyment, fun, engagement	[8, 12, 21, 32, 33, 36, 38–40, 47–49, 55, 57, 59, 60]	[9]	
Attitudinal change	[20, 21, 32, 41, 43, 44, 47, 48, 51, 53, 55]		
Self-esteem		[60]	
Empathy		[7]	
Motivational			
Civic motivation	[7, 20, 21, 32, 43, 48, 50, 52, 55, 56]		[41]
Interest in politics and global society	[39, 41, 47, 53–55, 57]	[47]	
Academic motivation	[33, 43, 48, 58, 60]		

Social			
Communication skills	[6, 20, 33–35, 38, 39, 50, 52]		
Cooperation skills	[7, 33, 38, 45, 48]	[60]	
Social cohesion orientation	[39, 44, 45, 54]		
Behavioral			
Acting for citizens' welfare and happiness			[34]

These findings were obtained through qualitative and quantitative methods. The majority of the reported findings were positive. Out of the 36 reviewed papers, 14 reported formally assessed learning outcomes and 13 perceived learning outcomes through student self-reports. The reported improvements in students' learning included content learning (e.g., students learned the curricular and academic requirements [35, 60]) and civic learning (e.g., students adopted civic values and/or learned to recognize their role in society [34, 52]). Other positive cognitive outcomes were improvements in students' thinking skills (e.g., critical thinking [48] and understanding multiple viewpoints [50]) and problem-solving skills (e.g., creativity [38] and/or persuasion skills [35]), both reported in 9 reviewed papers. However, four papers reported no effects on actual learning [8, 32, 41, 58] and two papers found no effect on students' perceived learning [9, 48]. One paper reported no effects on critical thinking skills [6]. Finally, one paper described negative effects on participants' learning, describing that some of the students developed misconceptions regarding civic knowledge and processes after playing the game [32].

As emotional outcomes, the gameful interventions were described as fun and enjoyable in 16 of the reviewed papers. Attitudinal change was found in 11 papers, describing shifts in, for example, students' political and academic attitudes [32, 41] as well as improvements in self-efficacy for civic engagement [20]. Null or mixed emotional outcomes were reported in three papers, reporting no effects on engagement [9] or on self-esteem [60], and mixed results in students' empathy skills [7].

Motivational outcomes included mostly improvements in participants' civic motivation to,

for example, actively participate in society [43, 55] or civic engagement [52, 56]. Interests in politics and global society were enhanced in 7 studies, and 5 studies reported positive outcomes in students' academic motivation. One paper reported results about negative civic motivation, finding slight growth in students' willingness to participate in politics through potentially illegal methods, for example through vandalism or civic disobedience [41]. Additionally, one study reported that the gameful intervention had no significant effect on students' interests to learn about the EU [57].

Social outcomes included improvements in students' communication in nine papers, and cooperation skills in five papers. Four studies reported a positive shift on students' social cohesion orientations, including values of social justice [45] and ethics [44]. One study stated no changes in students' cooperation and social skills [60]. Finally, behavioral outcomes were reported only in one paper, which described participants' aggressive gameplay style, where the game encouraged students to, for example, initiate wars in the game [34]. This is reported as a negative finding in terms of students acting for citizens' welfare and happiness.

4. Discussion

Gameful methods are regularly employed in classrooms, albeit teachers still remain unfamiliar with how to adequately utilize these methods for their needs [18]. Additionally, often short class durations and subject-oriented curricula are not convenient for long-term immersive gaming experiences, whether in digital or physical form. Nevertheless, game-based approaches in education are pursued, as they serve as an engaging platform for students to explore and apply knowledge regardless of their background, allowing to narrow the achievement gap between socio-demographics, genders and races.

However, notable here, compared to the other contexts of gameful interventions [24, 62–64], is that the majority of the game-based approaches employed in the reviewed papers are established programs and software specifically designed for civic or citizenship education, such as *Statecraft X*, *Space Station Leonis* and *Quest Atlantis*, perhaps explaining the observed positive impacts of these tools. Previous research indeed emphasized the importance of utilizing gameful tools especially tailored for the civic use context

to materialize positive outcomes [65]. However, many of the examined games and gameful methods are described insufficiently and superficially for the reader, making the evaluation of the game type and functioning mechanisms challenging. According to this review, we can assert that gameful interventions in civic education can enhance civic learning, foster positive attitudinal change towards politics and society, as well as increase motivation and interests in civic matters, but we lack the understanding of the exact attributes or game designs that facilitated these favorable shifts. Detailed descriptions of the examined games and variables are needed in order to extrapolate the most efficient approaches that influence students' cognitive, behavioral, motivational, emotional and social outcomes.

Unlike other gamification contexts, such as education or civic engagement [24, 63], the most employed affordances in the reviewed papers were designs that promote social interaction and collaboration, such as roleplay and teamwork, followed by game worlds that represent various models of digital environments, maps or 3D worlds, with the utilization of storytelling and narratives. With a few exceptions, these affordances were implemented together, facilitating a holistic experience of, for example, immersing oneself into the role of a mayor of a fictitious city. Roleplaying and story aspects in games have been emphasized in research before [66], since they often provide a variety of experiences of collaborative negotiations, networking and examining society and citizenship through multiple viewpoints [18, 23, 25]. Noteworthy, the classic implementation examples of gamification; points, badges and leaderboards, were relatively absent in the reviewed studies, indicating a growing emphasis on the aim of providing a deeper understanding of civic matters through role taking, storytelling and social interactions. As the skills of becoming a good citizen are rather open-ended and difficult to formally assess, the holistic style of the pedagogical gamification tools is perhaps more appropriate. Moreover, the lack of classic implementations of gamification is an especially interesting observation as reviews of gameful approaches in education at large [63] and civic engagement [24] specifically report the popularity of these mechanics and have called for increasing the design palette in these applications through storytelling and roleplay.

As the results of this systematic literature review show, the majority of the studies report positive outcomes, whereas negative, null or mixed outcomes are rarely reported. It is, however, important to ask if these overwhelming positive observations are due to the usefulness of gameful approaches or due to a lack of measurement of or reports on the negative or null impacts of these methods. A similar observation is reported in other literature reviews of gameful methods in different contexts [24, 62, 63]. These reviews have similarly raised questions on publication biases and emphasized individual differences in perception and experience of gameful interventions [64]. Following these findings, we recommend researchers to systematically measure learning, development of skills, behavioral and attitudinal change, as well as social aspects with larger samples and controlled interventions, to identify the long-term influence game-based approaches have on students. Such research is more likely to be heard by educators, policy makers, as well as game designers [18], which would potentially lead to a greater impact on educational activities in practice.

The reported impacts in the reviewed papers were mostly on students' cognitive abilities, such as learning, thinking skills and problem-solving. Emotional, social and motivational outcomes were reported to some extent, whereas behavioral outcomes were barely non-existent. This indicates that impact beyond gameplay and classroom activities stays fairly unknown, perhaps due to lack of sufficient measurement tools, and the need for generalizable findings on students' transferable civic skills still remains [18]. Nonetheless, improvements in, for example, communication skills or civic motivation tend to impact behavior, possibly reflecting a larger positive influence on an individual's life. Additionally, solely a fun, exciting and out of the ordinary (gameful) experience within school hours could be the pushing force to direct a young person to the path of curiosity, creativity and social good, regardless of perhaps awakening or shifting any civic attitudes or interests.

5. Limitations and future research

Our study is limited in scope by the limits of the Scopus database used as a sole source for the literature search. However, Scopus is recognized as the largest abstract and citation database of

peer-reviewed literature in the fields of, for example, science, technology, humanities and social sciences, covering over 7000 high quality publishers. After exploring other databases with our rather narrow query, it was determined that Scopus, with nearly 800 multidisciplinary hits, was sufficiently broad for this study. Nonetheless, some relevant research could not have been identified due to this limit. Additionally, the gameful affordances covered in this study were identified according to the descriptions in the reviewed literature, hence, potential mismatches and omissions in description could have occurred between the authors of the reviewed literature.

This review focused on formal education due to authors' interests in classroom activities and to answer the need for further research [16, 18]. However, it is important to remember the fact that citizenship education and development of civic skills happen, not only in formal education, but in all areas of young people's lives. From a gaming perspective, for example, many interactive media produced for entertainment purposes, including digital games, increasingly include civic dimensions which can have a strong relationship to a range of civic outcomes [67]. Hence, we encourage scholars to look beyond formal education and research civic learning through, for example, social media, entertainment games or other free time activities.

For future research, there is a need to remember that "teens" and "youth" are not homogeneous groups with similar attitudes and values, which is why civic education initiatives must be under constant evolution in terms of design, development and execution, and should acknowledge these personal and generational differences. These interventions should be relevant to youth coming from various backgrounds, ethnicities, genders and socio-economic statuses. It is vital to encourage especially unprivileged and underrepresented youth to actively participate in society and communities to have their voices heard, so that equal democracy is achieved and maintained. Noteworthy, most of the studies reviewed in this paper reported that game-based approaches supported all student participants, regardless of their demographics, which might indicate that games and gamification could be efficient in supporting young learners' civic engagement equally.

6. References

- [1] The World Youth Report: Youth Social Entrepreneurship and the 2030 Agenda, United Nations, New York, 2020. https://www.un-ilibrary.org/children-and-youth/world-youth-report-2013_613c6857-en (accessed June 7, 2021).
- [2] R.S. Foa, A. Klassen, D. Wenger, A. Rand, M. Slade, *Youth and Satisfaction with Democracy: Reversing the Democratic Disconnect?*, Bennett Institute for Public Policy, Cambridge, UK, 2020.
- [3] M. Sommers, *Youth and the Field of Countering Violent Extremism*, Washington, DC: Promundo-US, 2019.
- [4] European Commission, *Eurydice Brief: Citizenship Education at School in Europe*, European Union, 2018. doi:10.2797/83012.
- [5] World Youth Report, *Engagement Youth Civic Youth Civic*, United Nations Dep. Econ. Soc. Aff. 2016., https://www.un.org/development/desa/youth/wp-content/uploads/sites/21/2018/12/un_world_youth_report_youth_civic_engagement.pdf.
- [6] H.-L.L. Chen, Y.-C.C. Chuang, The effects of digital storytelling games on high school students' critical thinking skills, *J. Comput. Assist. Learn.* 37, 2021, pp. 265–274. doi:10.1111/jcal.12487.
- [7] Y.S. Chee, S.K. Loke, E.M. Tan, Becoming citizens through game-based learning: A values-driven, process approach to citizenship education, *Int. J. Gaming Comput. Simulations.* 1, 2009, pp. 32–51. doi:10.4018/jgcms.2009040103.
- [8] C. Klimmt, S. Ogbazion, Interesting, but not Necessarily Effective: Testing a Serious Game with Socially Disadvantaged Children, in: A. De Gloria, R. Veltkamp (Eds.), *Games Learn. Alliance*, Springer, Cham, 2016: pp. 238–244. doi:10.1007/978-3-319-40216-1_25.
- [9] C. Lorenzini, R. Brondi, M. Carrozzino, M. Nisticò, C. Evangelista, F. Tecchia, *LawVille: A collaborative serious game for citizenship education*, in: 2014 6th Int. Conf. Games Virtual Worlds Serious Appl. VS-GAMES 2014, Institute of Electrical and Electronics Engineers Inc.,

2014. doi:10.1109/VS-Games.2014.7012163.
- [10] H. Goren, M. Yemini, Citizenship education redefined – A systematic review of empirical studies on global citizenship education, *Int. J. Educ. Res.* 82, 2017, pp. 170–183. doi:10.1016/j.ijer.2017.02.004.
- [11] P. Tapingkae, P. Panjaburee, G.J. Hwang, N. Srisawasdi, Effects of a formative assessment-based contextual gaming approach on students’ digital citizenship behaviours, learning motivations, and perceptions, *Comput. Educ.* 159, 2020,. doi:10.1016/j.compedu.2020.103998.
- [12] T. Bratitsis, G. Meireles, C. Neto, WeAreEurope: An online game for European citizenship education for primary school, in: *Proc. 11th Eur. Conf. Games Based Learn. ECGBL 2017, Academic Conferences and Publishing International Limited, 2017*: pp. 38–46.
- [13] H. Haste, Citizenship Education: A Critical Look at a Contested Field, in: *Handb. Res. Civ. Engagem. Youth*, John Wiley and Sons, 2010: pp. 161–188. doi:10.1002/9780470767603.ch7.
- [14] D. Schugurensky, J.P. Myers, Informal civic learning through engagement in local democracy: The case of the seniors’ task force of healthy City Toronto, in: *Learn. through Community Explor. Particip. Pract.*, Springer Netherlands, 2008: pp. 73–95. doi:10.1007/978-1-4020-6654-2_5.
- [15] W. Carr, A. Hartnett, *Education And The Struggle For Democracy: The Politics of Educational Ideas*, 1996.
- [16] S. Themistokleous, L. Avraamidou, The Role of Online Games in Promoting Young Adults’ Civic Engagement, *EMI. Educ. Media Int.* 53, 2016, pp. 53–67. doi:10.1080/09523987.2016.1192352.
- [17] J. Torney-Purta, B. Wilkenfeld, *Paths to 21st century competencies through civic education classrooms*, Chicago, 2009.
- [18] C. Raphael, C. Bachen, K.-M. Lynn, J. Baldwin-Philippi, K.A. McKee, Games for Civic Learning: A Conceptual Framework and Agenda for Research and Design, *Games Cult.* 5, 2010, pp. 199–235. doi:10.1177/1555412009354728.
- [19] J. Kahne, E. Middaugh, High Quality Civic Education: What Is It and Who Gets It?, *Soc. Educ.* 72, 2008, pp. 34–39.
- [20] J.A. Chen, J.D. Stoddard, A Virtual Internship to Prepare High School Students for Civic and Political Action, *Educ. Technol. Res. Dev.* 68, 2020, pp. 3449–3470. doi:10.1007/s11423-020-09847-5.
- [21] M. Oberle, J. Leunig, S. Ivens, What do students learn from political simulation games? A mixed-method approach exploring the relation between conceptual and attitudinal changes, *Eur. Polit. Sci.* 19, 2020, pp. 367–386. doi:10.1057/s41304-020-00261-2.
- [22] B. Bimber, *Information and American Democracy: Technology in the Evolution of Political Power*, Cambridge University Press, 2003.
- [23] M.U. Bers, Let the Games Begin: Civic Playing on High-Tech Consoles, *Rev. Gen. Psychol.* 14, 2010, pp. 147–153. doi:10.1037/a0019490.
- [24] L. Hassan, J. Hamari, Gameful civic engagement: A review of the literature on gamification of e-participation, *Gov. Inf. Q.* 37, 101461, 2020,. doi:10.1016/j.giq.2020.101461.
- [25] J. Kahne, E. Middaugh, C. Evans, *The Civic Potential of Video Games*, CERG, 2008.
- [26] A.M. Toda, P.H.D. Valle, S. Isotani, The Dark Side of Gamification: An Overview of Negative Effects of Gamification in Education, *Commun. Comput. Inf. Sci.* 832, 2017, pp. 143–156. doi:10.1007/978-3-319-97934-2_9.
- [27] Y. Zhonggen, A Meta-Analysis of Use of Serious Games in Education over a Decade, *Int. J. Comput. Games Technol.* 4797032, 2019,. doi:10.1155/2019/4797032.
- [28] A. Domínguez, J. Saenz-De-Navarrete, L. De-Marcos, L. Fernández-Sanz, C. Pagés, J.J. Martínez-Herráiz, Gamifying learning experiences: Practical implications and outcomes, *Comput. Educ.* 63, 2013, pp. 380–392. doi:10.1016/j.compedu.2012.12.020.
- [29] A. Cooke, D. Smith, A. Booth, Beyond PICO: The SPIDER tool for qualitative evidence synthesis, *Qual. Health Res.* 22, 2012, pp. 1435–1443. doi:10.1177/1049732312452938.
- [30] S. Deterding, D. Dixon, R. Khaled, L. Nacke, From game design elements to gamefulness: Defining “gamification,” *Proc. 15th Int. Acad. MindTrek Conf.*

- Envisioning Futur. Media Environ. MindTrek 2011. 2011, pp. 9–15. doi:10.1145/2181037.2181040.
- [31] J. Webster, R.T. Watson, Analyzing the Past to Prepare for the Future: Writing a Literature Review, *MIS Q.* 26, 2002, pp. xiii–xxiii. doi:10.1.1.104.6570.
- [32] B. Blevins, K. LeCompte, S. Wells, Citizenship education goes digital, *J. Soc. Stud. Res.* 38, 2014, pp. 33–44. doi:10.1016/j.jssr.2013.12.003.
- [33] M.C. Bos, e-education and citizenship: Can 3D educational games play tricks on your mind?, in: *Proc. Eur. Conf. Games-Based Learn.*, Dechema e.V., 2005: pp. 77–86.
- [34] Y.S. Chee, S. Gwee, E.M. Tan, Learning to become citizens by enacting governorship in the statecraft curriculum: An evaluation of learning outcomes, in: *Des. Util. Anal. Simulations Game-Based Educ. Worlds*, IGI Global, 2013: pp. 68–94. doi:10.4018/978-1-4666-4018-4.ch005.
- [35] Y.S. Chee, S. Mehrotra, Q. Liu, Effective game based citizenship education in the age of new media, *Electron. J. e-Learning.* 11, 2013, pp. 16–28.
- [36] Y.S. Chee, E.M. Tan, Q. Liu, Statecraft X: Enacting citizenship education using a mobile learning game played on Apple iPhones, in: *6th IEEE Int. Conf. Wireless, Mob. Ubiquitous Technol. Educ. WMUTE 2010 Mob. Soc. Media Learn. Educ. Form. Informal Settings*, 2010: pp. 222–224. doi:10.1109/WMUTE.2010.16.
- [37] N. Diana, J. Hammer, J. Stamper, K. Koedinger, Persuasion Invasion, in: *Ext. Abstr. 2020 Annu. Symp. Comput. Interact. Play*, ACM, New York, NY, USA, 2020: pp. 50–53. doi:10.1145/3383668.3419927.
- [38] D.D. Fialova, Challenges for student’s skills and attitudes within social studies conventional simulation games, in: *Proc. Eur. Conf. Games-Based Learn.*, Dechema e.V., 2014: pp. 683–687.
- [39] S. Gwee, E.M. Tan, Developing a sense of identity as a governor within a mobile learning community, in: *Commun. Comput. Inf. Sci.*, Springer Verlag, 2015: pp. 172–183. doi:10.1007/978-3-319-25684-9_13.
- [40] R. Hodhod, D. Kudenko, P. Cairns, Serious games to teach ethics, *Polit. Sci.* 2009, pp. 43–52.
- [41] S. Ivens, M. Oberle, Does scientific evaluation matter? Improving digital simulation games by design-based research, *Soc. Sci.* 9, 2020,. doi:10.3390/SOCSCI9090155.
- [42] K. LeCompte, B. Moore, B. Blevins, The Impact of iCivics on Students’ Core Civic Knowledge, *Res. Sch.* 18, 2011, pp. 58–74.
- [43] C.P. Lim, Global citizenship education, school curriculum and games: Learning Mathematics, English and Science as a global citizen, *Comput. Educ.* 51, 2008, pp. 1073–1093. doi:10.1016/j.compedu.2007.10.005.
- [44] K.Y.T. Lim, Y.S. Chee, In stable orbit: An initial assessment of dispositional changes arising from learning using the citizenship education videogame Space Station Leonis, in: *15th Int. Conf. Comput. Educ. Support. Learn. Flow through Integr. Technol. ICCE 2007*, 2007: pp. 245–252.
- [45] K.Y.T. Lim, M.Y.C. Ong, The Rise of Li’ Titledot: A study of citizenship education through game-based learning, *Australas. J. Educ. Technol.* 28, 2012, pp. 1420–1432. doi:10.14742/ajet.779.
- [46] B.K. Litts, W.E. Lewis, C.K. Mortensen, Engaging Youth in Computational Thinking Practices through Designing Place-Based Mobile Games about Local Issues, *Interact. Learn. Environ.* 28, 2020, pp. 302–315. doi:10.1080/10494820.2019.1674883.
- [47] M. Oberle, J. Leunig, Simulation games on the European Union in civics: Effects on secondary school pupils’ political competence, *Citizenship, Soc. Econ. Educ.* 15, 2016, pp. 227–243. doi:10.1177/2047173416689794.
- [48] K.D. Poole, M.J. Berson, P. Levine, On Becoming a Legislative Aide: Enhancing Civic Engagement Through a Digital Simulation, *Action Teach. Educ.* 32, 2010, pp. 70–82. doi:10.1080/01626620.2010.549733.
- [49] S. Ravndal, Ø.Z. Johansen, G. Hammersaas, Game On! A Battle. An Engaging Game about Language and Democracy Contributing to Civic Learning, *J. Museum Educ.* 45, 2020, pp. 226–239. doi:10.1080/10598650.2020.1765502.
- [50] Y. San Chee, S. Mehrotra, Q. Liu,

- Effective citizenship education through mobile game based learning: The statecraft X curriculum, in: Proc. Eur. Conf. Games-Based Learn., 2012.
- [51] M.H. Shoon, Y.S. Chee, Redefining public policy education through an exploratory digital curriculum: Singapore's statecraft X, in: IADIS Int. Conf. Cogn. Explor. Learn. Digit. Age, CELDA 2012, 2012: pp. 3–10.
- [52] J.L. Anderson, Games and the development of students' civic engagement and ecological stewardship, in: Gamification Hum. Factors Integr. Soc. Educ. Psychol. Issues, IGI Global, 2015: pp. 199–215. doi:10.4018/978-1-4666-5071-8.ch012.
- [53] C.M. Bachen, P.F. Hernández-Ramos, C. Raphael, Simulating REAL LIVES: Promoting Global Empathy and Interest in Learning Through Simulation Games, *Simul. Gaming.* 43, 2012, pp. 437–460. doi:10.1177/1046878111432108.
- [54] C.M. Bachen, P.F. Hernández-Ramos, C. Raphael, A. Waldron, Civic Play and Civic Gaps: Can Life Simulation Games Advance Educational Equity?, *J. Inf. Technol. Polit.* 12, 2015, pp. 378–395. doi:10.1080/19331681.2015.1101038.
- [55] H. Baba, M. Ohyama, M. Sato, J. Yoshinaga, The Effectiveness of Negotiation Games in Citizenship Education: An Examination of Diplomatic Negotiation Game INDEPENDENCE DAY in a Japanese High School, in: A. Naweed, M. Wardaszko, E. Leigh, S. Meijer (Eds.), *Intersect. Simul. Gaming*, Springer, Cham, 2018: pp. 360–370. doi:10.1007/978-3-319-78795-4_25.
- [56] J. Lamarra, A. Chauhan, B. Litts, Designing for Impact: Shifting children's perspectives of civic and social issues through making mobile games, in: Proc. 18th ACM Int. Conf. Interact. Des. Child. IDC 2019, Association for Computing Machinery, Inc, 2019: pp. 274–279. doi:10.1145/3311927.3323338.
- [57] M. Oberle, S. Ivens, J. Leunig, Effects of EU Simulation Games on Secondary School Students' Political Motivations, Attitudes and Knowledge: Results of an Intervention Study, in: *Prof. Pract. Learn.*, Springer Nature, 2018: pp. 145–164. doi:10.1007/978-3-319-74147-5_12.
- [58] Y.-T.T.C. Yang, Building Virtual Cities, Inspiring Intelligent Citizens: Digital Games for Developing Students' Problem Solving and Learning Motivation, *Comput. Educ.* 59, 2012, pp. 365–377. doi:10.1016/j.compedu.2012.01.012.
- [59] W.F.W. Ahmad, Y.Y. Chen, S.N.A. Raman, Development of game-based courseware in Pendidikan Sivik: M-Master, in: Proc. - 2011 Int. Conf. User Sci. Eng. i-USER 2011, 2011: pp. 163–167. doi:10.1109/iUSER.2011.6150558.
- [60] R.J. Bonk, L.N. Simons, T.M. Scepansky, N.B. Blank, E.B. Berman, A Multidisciplinary Assessment of Chesteropoly as an Academic-Service Experience, *J. Exp. Educ.* 32, 2009, pp. 155–177. doi:10.1177/105382590903200205.
- [61] I. Granic, A. Lobel, R.C.M.E. Engels, The benefits of playing video games, *Am. Psychol.* 69, 2014, pp. 66–78. doi:10.1037/A0034857.
- [62] J. Koivisto, J. Hamari, The rise of motivational information systems: A review of gamification research, *Int. J. Inf. Manage.* 45, 2019, pp. 191–210. doi:10.1016/j.ijinfomgt.2018.10.013.
- [63] J. Majuri, J. Koivisto, J. Hamari, J.H. Fi, Gamification of education and learning: A review of empirical literature, in: Proc. 2nd Int. GamiFIN Conf., CEUR-WS, Pori, Finland, 2018.
- [64] A.C.T. Klock, I. Gasparini, M.S. Pimenta, J. Hamari, Tailored gamification: A review of literature, *Int. J. Hum. Comput. Stud.* 144, 10249, 2020,. doi:10.1016/j.ijhcs.2020.102495.
- [65] L. Hassan, Governments Should Play Games: Towards a Framework for the Gamification of Civic Engagement Platforms, *Simul. Gaming.* 48, 2016, pp. 249–267. doi:10.1177/1046878116683581.
- [66] I. Aura, L. Hassan, J. Hamari, Teaching within a Story: Understanding storification of pedagogy, *Int. J. Educ. Res.* 106, 2021,. doi:10.1016/j.ijer.2020.101728.
- [67] A. Lenhart, J. Kahne, E. Middaugh, A. Rankin Macgill, C. Evans, J. Vitak, Teens, Video Games, and Civics: Teens' gaming experiences are diverse and include significant social interaction and civic engagement, *Pew Internet Am. Life Proj.* 2008, pp. 1–64.