Players' Reflections on Digital Games as a Medium for Education: Results from a Qualitative Study

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Abstract: The use of digital game potential for education has been investigated extensively. However, little is known about how players themselves perceive educational possibilities of the entertainment games they play in their free time. This knowledge gap is problematic because players' own assumptions about learning with digital games will influence the acceptance and the outcome of any game-related educational intervention. Based on a qualitative content analysis of interviews with 19 adolescent and young adult players of five simulation games (Age of Empires, Cities Skylines, Civilization 6, Eco, and Tropico 6), this study investigates how players perceive digital entertainment games as a medium for (geography) education. While a few interviewees dismiss the potential of digital (entertainment) games, predominantly based on the games' contents instead of medial particularities, others embrace the educational possibilities of the medium wholeheartedly, based on its attractiveness and unique characteristics, including didactical features. A third group of respondents provided mixed reviews of (entertainment) games' educational potential by referring to advantages and disadvantages of the medium's characteristics, as well as the challenges of a simplified and/or inaccurate representation of content. Interviewees from all three groups underestimated the value of digital games for (geography) education beyond subject matter expertise. By solely framing (geography) education as the transfer of correct and politically neutral specialized knowledge, they failed to recognize games' possibilities in terms of achieving additional learning goals of contemporary (geography) education, such as critical reflection skills, argumentation skills, and the formation of opinion. Overall, many players rightly assume that a successful implementation into the geography classroom strongly depends on context variables, such as the selected game, target group, learning goals, and pedagogical concept. Above all, they stress the importance of briefing and debriefing by an educator. Finally, the players' levels of reflection and depth of argumentation varied significantly – presumably depending on their age, educational level, and the games they refer to.

Keywords: game-based learning, geography education, qualitative methods, media literacy, players, simulation games

1. Introduction and theoretical perspective

Researchers and practitioners who are contributing to the field of digital game-based learning carry comprehensive assumptions about players' learning with digital games derived from personal and professional experiences as well as academic studies (e.g. Steinkuehler, Squire and Barab, 2012). It is taken for granted that both educational and entertainment games do not just lead to informal learning processes, but should be applied in formal education, though details, such as effect sizes and pedagogical preconditions, are highly debated. There is also a detailed understanding of what teachers believe with regard to the possibilities and limitations of digital games in classrooms (e.g. Bourgonjon *et al.*, 2013; Beavis *et al.*, 2014). Not surprisingly, teachers' general attitudes to a classroom implementation of digital games are more diverse and, depending on who is asked, are more critical when compared to the professional community of game-based learning researcher and practitioners.

In contrast, we know little about how players themselves perceive the educational potential of digital games. Whilst there are some mostly survey studies about students' general acceptance of digital games for classroom learning (e.g. Bourgonjon *et al.*, 2010) and their experiences and perceptions of digital games in the classroom after they have been exposed to them (e.g. Beavis, Muspratt and Thompson, 2015), players' imagination about how the entertainment games they play in their free time could be used in formal (geography) education have not been explored in depth yet. This gap in knowledge is problematic because the implementation of entertainment games is increasingly favored over educational games (e.g. Martinez, Gimenes and Lambert, 2022), and players' own assumptions about learning with digital games will influence the acceptance as well as the outcome of any game-related educational intervention (e.g. Giannakos, 2013). Therefore, the present paper focuses on adolescent and young adult players' assessment of entertainment games that they play in their free time. Age of Empires, Cities Skylines, Civilization 6, Eco, and Tropico 6 have been selected due to their relevance in geography education as they cover topics such as climate change, city development, migration, and resource management, and their commercial and/or critical success. All of them fit into a particular genre of simulation games. Previous studies have shown that for geography education these games are particularly promising with

regard to the promotion of specialist knowledge about topics such as climate change and resource use (Lux and Budke, 2020a), the demonstration of systemic interrelationships (Lux and Budke, 2020b), and the facilitation of dynamic decision-making (Czauderna and Budke, 2020, 2021).

Consequently, the present paper intends to answer the following research question: How do players reflect on the simulation games they play in their free time (for entertainment purposes) as a medium for geography education? To answer this research question, we conducted a qualitative content analysis (Mayring, 2004) of 19 interviews with adolescent and young adult players of the five simulation games.

In the context of this paper, we understand the concept of reflection (see e.g. Brockbank and McGill, 2007) as critical evaluation of and argumentation about digital games in terms of their potential for (geography) education, as part of a wider games literacy (Buckingham and Burn, 2007). We furthermore assume that an adequate reflection on digital games as a medium for education requires a consideration of three distinct objects of reflection: (1) the games' learning contents; (2) the games' structure/mechanics (compared to other media) and; (3) the games' (potential) classroom implementation/the educational context. In our analysis, we examine all of these areas separately in three different sections (3.1.-3.3), before we investigate individual differences in level of reflection and media literacy from an overall perspective in the final section (3.4).

2. Methods

This study relies on a qualitative content analysis (Mayring, 2004) of 19 semi-structured interviews with 16 adolescent and young adult players of five simulation games (Age of Empires, Cities Skylines, Civilization 6, Eco, and Tropico 6). Interviewees were between 12 and 22 years old, with 3 interviewees identifying as female and 13 identifying as male. All interviewees are avid players of at least one of the games. Each interview focused on one of the games. In the case of three players we conducted two interviews or split the interview in two parts, covering one of the games each. The following table shows a summary of our interviews – including our interviewees' age, gender, and the game(s) discussed:

Table 1: Overview of interviews/interviewees

ID	Age	Gender	Game
I1a	22	male	Age of Empires (AoE)
I1b			Cities Skylines (CS)
I2	12	female	Age of Empires
I3	19	male	Age of Empires
I4	15	female	Cities Skylines
I5a	18	male	Cities Skylines
I5b			Civilization 6 (Civ)
I6	13	male	Cities Skylines
I7	18	female	Cities Skylines
I8a	18	male	Cities Skylines
I8b			Civilization 6
I9	22	male	Civilization 6
I10	18	male	Civilization 6
I11	19	male	Civilization 6
I12	20	male	Eco
I13	13	male	Eco
I14	20	male	Eco
I15	20	male	Tropico 6
I16	20	male	Tropico 6

All interviews were conducted in the German language and, as such, the quotes in this paper are translations by the authors. While the interviews were broader in scope, focusing on, for example, players' assessment of their own learnings and the games' representation of reality when it comes to topics relevant for geography education such as climate change, city development, migration, and resource management, the analysis mainly investigates interviewees' answer to one of our main questions "How would you feel about using game X in geography classes?" and follow-up questions which aimed to get players to justify their opinion. After formulation of our research question, interview transcripts were inductively coded according to qualitative content analysis (Mayring, 2004), using the software MAXQDA. The final code system consists of the following categories:

1. Positive evaluation of the potential of games for (geography) education > based on their medial characteristics/structure
2. Positive evaluation of the potential of games for (geography) education > based on their content
3. Negative evaluation of the potential of games for (geography) education > based on their medial characteristics/structure
4. Negative evaluation of the potential of games for (geography) education > based on their content
5. Reference to/discussion of classroom implementation (including the role of educators)
6. Passages that (contain) signs of media reflection/games literacy
7. Passages indicating that reflection is absent

In the following results section, we use text coded into categories (1), (2), (3), and (4) to outline how interviewees assess digital games as a medium for (geography) education based on their contents (3.1) and on their structure/game mechanics (3.2). Afterwards, we describe their assumptions about the implementation of digital games in the classroom, coded into category (5) (3.3). Throughout these sections, interviewees' level of reflection and media literacy becomes implicitly apparent, which is discussed at the end of each section. Finally, we investigate individual differences in level of reflection and media literacy, as coded into categories (6) and (7) (3.4).

3. Results

3.1 Assessment of digital games as a medium for geography education based on their contents

When asked to what extent digital games are suitable for incorporation into geography lessons, some of the respondents answered that they see similarities between the topics of the games and the topics of geography lessons and therefore think it makes sense to use them. The topics of urban development and urban planning are mentioned particularly frequently (particularly those including location factors, functions of the city, and functional division of cities) as well as climate change and (sustainable) use of resources. An example is given in the following interview quotation:

> *"Oh, climate change and how valuable resources are, how rare resources are, but also to some extent action and how our global society works."* (I12, 20 years old, male, Eco)

Single interviewees also mentioned topography, plate tectonics, social inequality, and, as in the quote, globalization as appropriate topics. In this context, it was noted in a number of cases that many digital construction games are a simulation of the world, which the players can explore in their systemic connections through an explorative approach:

> *"Then you could let students try out for themselves how they can get a city to grow and how you can ensure the economic survival of the city, the functional structure of the city with industry, commerce, housing, leisure and so on, trade with other cities can also be represented by building export-oriented industry and so on, that can be simulated very well. You could then simply commission different scenarios for the students."* (I5, 18, male, CS)

However, the quality of the game-based simulation in terms of reality outside the game is judged to be too low for incorporation by the other part of the interviewees, and from this it is deduced that they are not suitable for geography lessons:

> *"[The classroom use of digital games] would probably rub some students the wrong way because like I said before, it's not really realistic."* (I2, 12, female, AoR)

This interviewee also thought that digital games present mainly fictional content and therefore considers them unsuitable for learning about real issues in geography lessons. This view is supported by interviewees who suspect that other game elements, such as victory conditions, combat actions or the narratives in the games are more dominant than the content, and therefore distract from learning:

> *"I don't think that would fit or I would find that bad, because it is very much based on this combat aspect. And if at all, because in my game that's not the case at all, but if at all then this climate aspect generally comes very late into the game and these effects, they then also, as I said, become noticeable, but not noticeable enough for that to somehow make an impression."* (I8, 18, male, Civ)

One respondent also expressed fear that digital games, which, in some cases, include politically controversial content, could manipulate and politically influence students:

> *"I wouldn't take Tropico like that. It is sometimes not politically correct. I, for example, like to play things that I wouldn't support in the real political world. But people who are very impressionable or very young, I do think that the actual events are often underestimated because you have a relatively trivialized version of the game."* (I16, 20, male, Tropico)

In summary, there were very few subject-related topics mentioned in the interviews that were thought to be dealt as well in digital games as in geography lessons and consequently would be appropriate for incorporation into lessons. The assessment of the suitability of the games for teaching varies greatly between respondents, thought to be due to different understandings of how each of the games simulated topics that are also covered in geography lessons. Some of the interviewees considered the learning of content through the games to be possible, particularly the possibility of understanding systemic relationships through playing. Another group of the respondents considered the games to be too fictitious, too simplistic and therefore unsuitable for teaching subject knowledge.

The interviewees' focus on teaching expertise through digital games only relating to a limited number of topics is probably due to a limited understanding of geography. Therefore, the importance of teaching competencies in the area of spatial orientation, communication, personality development and assessment, which are important components of geography lessons, are not likely to be associated with digital games. Some of the respondents saw many deficits in the games with regards to conveying subject knowledge. However, the statements in this area were often very vague, which is thought to be due to their lack of subject matter expertise. In addition, the predominant understanding seems to be that all teaching media have to present comprehensive, correct and politically neutral knowledge. However, such an approach means that students would then not be given any starting points for training their critical reflection skills, argumentation skills and also little impetus to form opinions, all of which are central skills goals in contemporary teaching. Finally, the role of the teacher, who embeds the media into the lesson and can initiate reflection, is not considered in some cases.

3.2 Assessment of digital games as a medium for (geography) education based on their structure/game mechanics

When our respondents agreed there was potential in the use of games as a medium for (geography) education, their argument was predominantly based on the games' structure, and particularly their mechanics. They, for instance, refer to motivational aspects, as the following quote documents:

> *"I think you can use the game at the beginning of the topic of urban planning. So, as a kind of introduction to the topic. **The game can arouse much more attention and interest.**"* (I7, 18, female, CS)

The interviewees furthermore refer to the games' interactivity, as in this quote: *"Yes, I mean, you can bring that up in a very **interactive way**."* (I12, 20, male, Eco)

Thereby, the focus is mostly on the possibility to act as a player, while the feedback of the games is barely mentioned. The following quotes emphasize players' active role as a unique feature of the games with educational potential:

> *"I think that would be good, because it would definitely be a change from the current geography lessons and then you could let students **try out for themselves** how they can get a city to grow and how you can ensure the economic survival of the city, the functional structure of the city with industry, commerce, housing, leisure and so on."* (I5, 18, male, CS)

> *"And I think if you **experience it actively** in such a medium and also **play it yourself** and not in a framework where it becomes directly so pedagogical, but where you also open up the whole thing yourself and you also work with these consequences or these principles in the game, so you really have to apply it practically in the game this topic, how do I make the industry there now? How do I dismantle it and how do I make the best possible use of my environment? That's why I think this medium is very suitable."* (I14, 20, male, Eco)

In many cases, respondents frame the games' interactivity and their inherent learning potential in contrast to other educational and/or entertainment media:

*"I would definitely find it very cool, because then **you can just try things out** and so vividly and I think **that's better than just working with a book or something.**"* (I4, 15, female, CS)

"I think computer games have even more influence than other entertainment media that used to have those influences because you interact with it more and it doesn't just affect you like when you watch a movie then maybe I can think about it but you can't change the story like when you have a game now. Then of course you can take a lot of influences on how you play your game or you can learn a lot better with it because if you do something you learn more than if you just read through or watch something."
(I16, 20, male, Tropico)

It is apparent from quotes thus far that many players argue for a classroom implementation of games based on features such as interactivity and action-orientation, which build up play, to facilitate/support learning. However, other players were less optimistic and referred to game features when questioning the value of games for educational purposes. They, for instance, thought that games are difficult to assess for some players due to their level of difficulty and required time:

*"I think the problem then is more with other aspects. I think you can use the content pretty well for that, actually. I think the problem is simply that most people wouldn't be interested in getting to grips with a game like this, because it's – You can play the game for 30 minutes, but then you haven't got through the tutorial yet. But I think that's more the problem that it's just not – I don't know what it's called in German, but **it's just not accessible enough**, I think."* (I15, 20, male, Tropico)

Additionally, some interviewees perceived play and learning as contradictory:

*"You would just have to think about how to make sure that people would then engage with it. **Not just playing the game, but really learning.** Somehow. I find that difficult."* (I9, 22, male, Civ)

Despite the concerns of some respondents, most considered games to have potential to be meaningfully applied in (geography) education. Respondents in favor of games' classroom implementation referred more to structural features of the games (game mechanics) than to their contents. As experienced players they bring a certain degree of games literacy as they know characteristics of games, such as interactivity, allowing them to competently relate to these characteristics in their argumentation. However, their understanding of interactivity is incomplete. When discussing interactivity, they mostly focused on the player, the possibility to act, whilst neglecting the side of the game and consequently failing to explain the important role of game feedback. It is thought these respondents derived their analysis of games' classroom implementation from their own motivation of playing games in their free time and therefore overemphasize their own actions. Overall, the majority of interviewees responses were not specific to geography education and instead referred to general classroom education and/or are transferable to other subject areas.

3.3 Assumptions about the classroom implementation of digital games
When asked how digital games could be meaningfully integrated into geography lessons, the majority of respondents referred to the teachers, from whom they expect to incorporate game play through didactic planning. The respondents thought teachers should select games that contain complex content and fit the learning groups in terms of gaming experience and content knowledge. In many cases it was said that the unreflective use of games alone would not be sufficient to achieve a learning effect:

"So, I don't think it would have any benefit if you just let the students jump into the game." (I10, 18, male, Civ)

Reference to lesson planning included choice of the didactic setting in which to use the game. In this context, several respondents considered the introduction to the lesson to be particularly suitable, and justify this by saying it would motivate students about the main lesson topics, which could be triggered in the students through the use of the game:

*"I think you can use the game at the beginning of the topic of urban planning. So, as a kind of introduction to the topic. **The game can arouse much more attention and interest.**"* (I7, 18, female, CS)

The possibility of activating prior knowledge through the use of games in the introduction was also mentioned. Furthermore, some interviewees consider the limitation of the genre-specific long play time to be relevant and the concentration on game scenes or levels to be of great importance for the topics dealt with in class. In this context, the following player suggested, for example, that in the game Civilization only a particular age may be selected to be played in class:

> *"I would maybe take the individual ages, because you can also do that when you create a game, you can also limit everything to a number of years and just start there in that age or in that age and then **limit the whole thing so that you only concentrate on a smaller area** and don't just gamble through, but really take the whole thing – take your time for it and only take the things from the industrial era, for example, and then go further later."* (I9, 22, male, Civ)

Players also made suggestions about the appropriate social form for playing in the classroom. In this context, playing in groups is seen as particularly suitable. In addition, players suggest that teachers produce assignments to guide playing of the games. According to the interviewees, reflecting on the game after playing would be of paramount importance. In particular, the importance of reflection on the correctness of the content presented in the game in comparison to reality was emphasized, an example of which is seen in the following quotation:

> *"I think in terms of content, it can definitely be used, if of course it is also **commented on with the teachers** that this is not so true after all – **the aspects that are then not so realistic**."* (I15, 20, male, Tropico)

Furthermore, it was suggested that reflection on the internal reality of a game could be undertaken whilst playing and pausing the game:

> *"And then a reflection, in a way: What is happening right now? Why is this happening? Are there other solutions? How can this be prevented? In other words, we should go into detail about what is actually happening."* (I10, 18, male, Civ)

In summary, the players expressed a wide range of ideas on how games can be used positively in geography lessons. In addition to the didactic selection of the game to be used, the embedding of the game in the lesson was a central concern, which was considered to be connected with tasks during the game and for the preparation and follow-up of the game. However, the ideas expressed are for the most part quite vague, which is not surprising since the interviewees have no didactic training.

3.4 Individual differences in level of reflection and media literacy

As identified in previous sections, a lot of players are able to critically reflect on digital games as a medium for (geography) education, referring to their contents (3.1), structure/game mechanics (3.2), and possible educational context (3.3.). However, we have also outlined its limits. Overall, we assume that the level of reflection and depth of argumentation, as part of games literacy (Buckingham & Burn, 2007), vary significantly between people: from having no imagination of how entertainment games may contribute to formal education or a naïve appreciation of their attractiveness (without backing up the respective position with solid arguments) to a sound understanding of how digital games function as educational medium (in contrast to other media and didactical approaches) and comprehensive ideas and suggestions as to how they may be implemented into a (geography) classroom, and visionary and/or balanced evaluation of classroom implementation (see 3.3). Obviously, this may partly depend on the respondents' age, educational level, and the games they refer to, which should be investigated in future research.

The following quote reveal one of the players' high level of educational games literacy, as he has a sound understanding of how digital games can function as educational medium with regard to various social issues, such as climate change and resource use, in comparison to other media and didactical approaches:

> *"So such games, of course, are clearly time-consuming, I think such contexts could also be crammed into a 1 ½ hour seminar, but that's not active for the people who are supposed to learn something from it and I think if you experience it actively in such a medium and also play it yourself and not in a framework where it becomes directly so pedagogical, but where you also open up the whole thing yourself and you also work with these consequences or these principles in the game, so you really have to apply it practically in the game this topic, how do I make the industry there now? How do I dismantle it and how do I make the best possible use of my environment? That's why I think this medium is very suitable."* (I14, male, 20, Eco)

In contrast, other players showed no imagination of how entertainment games could be implemented into the (geography) classroom, as the following quotes from two younger players show:

"Now this is kind of strange to me because teachers generally don't use games, but if they did use them, [that] would probably rub some students the wrong way because like I said before, it's not really realistic and yeah, you can't say that quickly now." (I2, 12, female, AoE, when asked how she would find it when teachers used AoE in geography classes to teach city development and resource usage)

"I think that's okay. It just doesn't have to be. But you can do it." (I13, male, 13, Eco)

Others younger interviewees appreciated the value of digital games for classroom application, probably intuitively, but were not able to back up their position using solid reasons. I6, for instance, said that he:

"would actually find that [the application of digital games in education] quite exciting because it's just fun like that and of course you learn something in the process and yes." (I6, male, 13, CS)

The interviewee neither delivers an explanation why it may be important to have *"fun"* in school with games nor what to *"learn something in the process"* means. When asked about what he has learnt previously in informal play, such as city development in Cities Skylines, his lack of reflection was equally apparent:

"That it's just not that easy, yes, and that everything has to be right, so to speak, or something. I do not know." (I6, male, 13, CS)

Overall, this younger player does not seem to be able to verbalize both his learnings during informal play and, on a more abstract level, why and how digital games could be a promising medium for education.

4. Conclusions

Based on a qualitative content analysis of semi-structure interviews with 19 adolescent and young adult players of five simulation games (Age of Empires, Cities Skylines, Civilization 6, Eco, and Tropico 6), this study focused on how players feel about the use of digital entertainment games as a medium for teaching in (geography) education. While a small number of interviewees dismissed the potential of digital (entertainment) games, mostly based on the games' contents instead of medial particularities, others embraced the educational possibilities of the medium wholeheartedly, based on its attractiveness and unique characteristics (known to them from their own experiences). A third group of interviewees delivered mixed reviews of (entertainment) games' educational potential by referring to advantages and disadvantages of the medium's characteristics, and to challenges of a simplified and/or inaccurate representation of content.

The observed variation in attitudes towards and evaluations of learning with digital games correspondents to results from previous mostly quantitative research investigating students' experiences and perceptions of digital games in the classroom including a study by Beavis, Muspratt and Thompson (2015) that found, among other things, noticeable differences between girls and boys.

In general, in our study, most interviewees underestimated the value of digital games for (geography) education beyond subject matter expertise. By solely framing (geography) education as the transfer of correct and politically neutral specialized knowledge, they failed to recognize games' possibilities in terms of other learning goals of contemporary (geography) education, such as the promotion of critical reflection skills and argumentation skills as well as the formation of opinion. However, many respondents understood, that a successful implementation into the geography classroom strongly depends on context variables, such as the selected game, target group, learning goals, and pedagogical concept. Above all, they stressed the necessity of briefing and debriefing by an educator, which fits with the current state of research (see e.g. Crookall, 2014).

Overall, players' level of reflection and depth of argumentation varied significantly, thought to be controlled by their age, educational level, and the games they referred to. The respondents varied from having no imagination of how entertainment games may contribute to formal education or a naïve appreciation of their potential but not providing evidence for their position, to comprehensive ideas and suggestions of how digital games may be implemented into the (geography) classroom.

The practical implications of our results are twofold:

1. By taking players seriously as experts in both digital games and their own learning habits/preferences, as well as reflective students who know geography education from their own experience, our results offer conclusions for the design of educational games and educational practice alike. In this context, it is of particular importance to consider that the players' own assumptions about learning with digital games will influence the acceptance and outcome of the classroom use of digital games (e.g. Giannakos, 2013). Furthermore, it must be taken into account that players differ in their attitudes towards learning with digital games. Thus, as Beavis, Muspratt and Thompson (2015, p. 39) conclude, in curriculum design and educational practice, "it is important to attend to the voices of all students and to meet students 'where they are at'. In technological times, as always, diversity matters."

2. By shedding light on our interviewees' unequal ability to reflect on games as educational technology, our results point to the need of media education to increase games literacy of players (Buckingham and Burn, 2007) in particular and media literacy (Livingstone, 2004) in general. The sub-literacy we investigated may be part of what may be called "educational games literacy".

In conclusion, the results of our qualitative study on players' reflections on digital games as a medium for education must be seen as exploratory. Among its limitations is that the concept of media literacy has not been operationalized and systematically measured. Furthermore, the age range of our limited amount of participants is large. The level of cognitive development of a 12-year-old is not comparable with a 22-year-old, which will have impacted the results of this study. In addition, it must be mentioned that we did not include players with little or no experience with relevant games. Finally, we approached the topic from the perspective of one school subject (geography) and only included reflections on one particular genre. Future studies must operationalize and systematically measure the concept of media literacy, consider variables such as age, gender, educational background, gaming experience, and include reflections on other genres referring to a variety of other school subjects.

Funding

Acknowledgments

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