



TEACHER ATTITUDES TOWARD GAME-BASED LEARNING IN HISTORY EDUCATION

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ABSTRACT

Game-based learning (GBL) is an emerging field reaching new contexts. Research has reported about students' rich use of digital games and the learning potential of GBL in traditional school subjects. Digital games have been tested as educational tools in various subjects in Swedish schools during the last decade, in areas such as teaching and learning of history and foreign languages. However, there is a lack of detailed research on attitudes toward the use of GBL in history education.

Main aim of the study was to examine and discuss attitudes toward an increased use of digital games in formal history education. Earlier studies have analysed students' opinions and preferences, but this study has a focus on the teacher perspective and on which design factors are important if digital games should be an alternative for self-learning in history education. The research approach has been qualitative cross-sectional study where secondary school teachers have answered questionnaires with open-ended questions on their view of didactics and the use of GBL in formal education. All selected respondents are registered as professional secondary school history teachers. Furthermore, teachers have described their own gaming habits and their game design preferences.

Findings show that a majority of the informants have good knowledge about digital games with historical setting and also a positive attitude toward an increased use of GBL. Secondary school teachers also have a tradition of using various media in their teaching and learning activities and there are neither any regulations against an increased use of digital games. An important aspect of history education, where digital games might not be the first choice, is in the description of the main changes and influence of a historical époque. Authors' recommendation is to use games that can enable tangential learning where the gaming sessions could be seen as appetisers for further and deeper learning.

KEYWORDS

Game-based learning, GBL, History education, Digital games, Tangential learning I

INTRODUCTION

Besides being a hyped and emerging research Game-based learning (GBL) has also been widely discussed in the educational sector in the 21st century. There are several studies indicating that GBL is not only a motivating educational idea, but also a didactic concept that carefully implemented could be an alternative with better outcomes than with traditional methods (Malone & Lepper 1987; Gee 2003; Prensky 2001).

A frequently identified problem with educational games is, according to Breuer & Bente (2009), that they mainly are designed for learning and not for entertainment. This can be a barrier to students' engagement

as well as learning when the gameplay is not challenging enough. To enable GBL in educational contexts games need to be more than educational tools. Prensky (2001) points out that it is a waste of money to invest in learning games that lack entertaining values. Well-designed games should mix learning content with exciting gameplay to achieve joyful learning.

GBL is a relatively young concept if compared to traditional learning material and with the interesting novelty of engaging interactivity (Breuer & Bente, 2009). Digital games with their new features and mechanisms also have new research concepts, and one of them is tangential learning. In games designed for tangential learning the primary objective is not to actively educate the player, but rather to create an interest for game themes and game environments. With the long-term effect of students seeking information by themselves and learning about facts and phenomena related to game themes and learning objectives (Floyd & Portnow 2008).

Another, older and more analysed concept is intrinsic motivation, which in GBL often is based on ideas from Mark Lepper and Thomas Malone (1987). Intrinsic motivation could be exemplified as gaming for gaming's sake and also learning for learning's sake, like someone reading a book for joy and self-fulfilment without expecting any external rewards or credits. Intrinsically motivated students tend to be more aware of complexities and unexpected possibilities than others (Kapp, 2012). Furthermore, intrinsically motivated students seem to spend more time and effort learning a topic and also with a tendency to use the acquired knowledge in the future (Malone, 1981). Important factors in a game to stimulate intrinsic motivation on the personal internal level are challenge, curiosity, control and fantasy (Malone & Lepper 1987).

According to Prensky (2001) a general problem in contemporary education is that learning content as well as instructional design are too boring. The suggested idea is to increase the use of digital games in most educational contexts to engage learners. This could be applied in many courses and subjects, but there are few areas with so many existing quality games as History. Two eras with a wide variety of popular games are the Roman Empire and World War II.

An example of a game that would be interesting for History education is the strategy game Rome: Total War where the player can choose among roles such as politician, officer or city planner (Creative Assembly 2004). Another game analysed in this study is Call of Duty, where the game can be played through the eyes of a British or a Soviet World War II soldier (Infinity Ward 2003). Historical environments have been used in the game industry as a way to create game worlds that often are more convincing and engaging than fictive ones, with an immersive atmosphere that is appreciated among gamers (Floyd & Portnow 2014).

Problem

Contemporary studies show that digital gaming is a wide-spread and engaging passion in general (Juil, 2010), and for the younger generation in Sweden in particular (Swedish Media Council, 2016). It can be seen as a problem that this new medium is not more used and integrated in subjects where useful games are available. In the field of History education there exist several appropriate genre alternatives for several historical eras. Games might be used to modernise the existing instructional design, where are the barriers?

There exist some studies that have investigated the students' view of GBL in Swedish educational settings Larsson-Auna (2012), but here are less studies on the teacher perspective. This study had a focus on Swedish secondary school teachers' view of using games in History education.

Aim of the study

The aim of the study was to examine and discuss Swedish secondary school teachers' attitudes toward an increased use of digital games in formal History education.

2 EXTENDED BACKGROUND

Digital games can be defined as an interactive medium played on computers, game consoles or mobile phones with some kind of screen (Dictionary.com, 2017). According to James Paul Gee (2003) games have

a strong learning potential since the aim is to find solutions to problems where the player finds pleasure in the challenge of overcoming obstacles in the game. Breuer & Bente (2009) have divided games broadly into two categories: serious games and commercial games. A serious game is a game that primarily is designed for learning outcomes while a commercial game basically is developed to entertain. In an extended definition serious games should involve learning activities resulting in knowledge and skills that are of use in real world settings (Zyda, 2005).

Depending on the interpretation of the term serious game, it can be seen either as an oxymoron or as a tautology. An oxymoron in the aspect that a game is associated with entertainment, the opposite of seriousness, or a tautology since play and games always have had an evolutionary role to help humans to survive, and for that reason fundamentally serious (Breuer & Bente, 2009).

Game-based learning

The use of games in educational contexts is an old tradition where mathematical and strategical concepts have been illustrated and practised for thousands of years with the use of board games like Chess and Kalaha. Discussions on pedagogical aspects of playing games for more general learning started in the 1970s based on ideas by Jean Piaget (1973) and Lev Vygotsky (1978). Contributions which also might be seen as a continuation of the older discussions on the general human need of play that was started by the Dutch cultural theorist Johan Huizinga (1938), with ideas about mankind as *Homo Ludens* or in English *Playing Humans*.

In the 1980s the birth of digital games started a renaissance for GBL when Thomas Malone (1981) did an analysis of why computer games are so obviously engaging and motivating. Malone's findings had three key components: challenge, curiosity and fantasy. Another early pioneer in the 1980s studying how games stimulate learning and motivation was Mark Lepper. Later Lepper and Malone compared and combined their findings in the creation of the Taxonomy of Intrinsic Motivation. The found components of intrinsic motivation were divided into the levels of internal motivation and the level of interpersonal motivation (Malone & Lepper, 1987).

Research on GBL has been a fast emerging and hyped field in the 21st century with a creation of different subfields. GBL is today an integrated part of various educational concepts and there are at least four branches:

1. GBL by playing commercial of-the-shelf (COTS) games
2. GBL by playing tailor-made educational games
3. GBL to support social inclusion of disadvantaged groups
4. GBL based on game construction

This study has a focus on Branch 1 since the field of History has a rich variety of well-designed COTS games for many historical eras. However, Branch 4 and the idea of game construction might be an idea for History education also and not only for Computer science. As an example Huizinga et. al. (2009) have described in a Dutch study how students' active involvement in the construction of games seem to have a great potential. With the same idea in Netherlands as in other parts of the world with GBL stimulating flow and motivation (Admiraal et. al. 2011).

Tangential learning

GBL must not necessarily have to teach course topics directly. In a video recorded by Floyd and Portnow (2008) the concept of tangential learning is suggested as an alternative or complementary to facilitate learning. The basic idea of the term is that a game introduces a theme, a technique or a concept to inspire and motivate learners to further self-studies (Portnow, 2008). Instead of direct teaching and learning activities games should engage and stimulate learning by putting related content in an attractive and engaging game context. Squire, DeVane & Durga (2008) explored the potential of tangential learning in a

study where lower secondary school students played the well-known and popular game Civilization III during a year. Civilization is a game on history with a relatively high degree of realism where players can follow a civilization from its beginning to present time (Squire, 2005). Participants in the study could be described as low and average performing students with low commitment to traditional teaching activities in History classes. By playing Civilization III they got motivated to seek information outside the actual gaming and during the year they improved their formal subject grades (Squire, DeVane & Durga, 2008). In Mozelius, Fagerström and Söderquist (2016) weak positive correlation was reported between knowledge acquisition and tangential learning.

3 METHOD

The overall research strategy has been a qualitative cross-sectional study where data has been gathered from a subset of Swedish secondary school teachers during May – June 2016. The strength of the strategy is the possibility to give a detailed image of a phenomenon at a specific point of time (Denscombe, 2014). On the other hand, an identified problem with cross-sectional studies is that they are snapshots where the inquiry may provide differing results if the time-frame had been different (Levin, 2006). Cross sectional studies are useful at identifying associations that later can be followed-up and more thoroughly studied (Mann, 2003).

The majority of cross-sectional studies with a quantitative design have used questionnaires or structured interviews to collect data, while the qualitative studies have a tendency to use semi-structured interviews (Bryman, 2006). Given the goals and logic of the qualitative approach, purposive sampling is often the employed strategy to get a detailed understanding of a selected groups' experiences. Aligned to the research goals, a purposive sampling strategy should select individuals or groups that provide a rich specialised insight into the research questions (Devers, & Frankel, 2000).

This study has been carried out as a small scale survey with the focus on open ended questions with longer more in-depth answers. Around 30 teachers have answered a qualitative questionnaire with questions not only on their view on existing games but also on their own gaming habits and which games that are suitable to involve in teaching and learning activities. There were also questions on learning material in general and how various media might be combined with traditional teaching sessions. To assess the quality of the answers some questions were related to detect inconsistency.

Data analysis

Collected data was analysed in a thematic analyse to identify, analyse and report thematic patterns grouped as categories (Braun & Clarke 2006). In the initial phase thematic patterns can be found and listed according to their frequency in the data set (Ryan & Bernard 2003). Patterns and themes can be identified either deductively/ theory driven or inductively/data driven (Braun & Clarke 2006). This analysis was carried out inductively and one reason was that there are few earlier studies or theory on the teacher view of GBL. Finally, found thematic patterns were grouped in seven categories which all are presented and discussed in Chapter 4 Findings and discussions.

Research ethics

No names or personal details about the informants have been published and all the information in the analysed questionnaires have been kept as anonymous as possible. The study has been conducted as recommended by the Swedish Science Council (Hermerén, 2011).

4. FINDINGS AND DISCUSSIONS

Found patterns in the analysed data were grouped into the following seven categories: Attitudes toward GBL, Media types and teaching resources, Historical accuracy, Insight into historical events, Teachers' gaming preferences, Game design and Potential problems. Answers were in general surprisingly detailed and with a depth that motivates to go through the categories one by one with separate discussions. To

distinct between the various respondents they are referred to as Respondent 1, Respondent 2 ... following the order in which their questionnaires were submitted.

Attitudes toward GBL

The first obvious finding is that the general attitude toward GBL and other alternative teaching media was very positive amongst the respondents. Just a few respondents brought up drawbacks with an increased use of digital games. Several answers were relatively short, affirmative and resembling the one from Respondent 8: "Sounds like a concept worth trying", but sometimes with the minor reservation: "Great, but it can be a problem if not all students play the game. But the same goes for most learning content and homework" (Respondent 13). Some teachers also brought up the interesting idea of GBL as part of a 'flipped classroom' setup and with the same reservation: "Good, but as with all types of flipped classrooms there is a risk that students don't do their homework" (Respondent 16).

Another question with association to flipped classrooms was the one about the idea of students playing games and that the following teaching activities should be adapted to discuss themes in the played games. The same pattern here with some short affirmative answers like "Yes, this could have advantages" (Respondent 16) but also with doubts like "I could certainly work, but it would need thorough planning and preparation" (Respondent 22) or, "Yes, but it's depending on the game quality and it could be an alternative for students' with reading disabilities. But not only gaming there must be reading and writing involved as well" (Respondent 29).

Accept from questioning secondary school students' self-discipline several respondents pointed out the potential for more motivated students. From the teacher perspective Respondent 19 brought up that "It would increase the teachers' workload when different students are in different stages of a game". There was also a question on what the teachers see as the most interesting part of their job, where Respondent 15 wrote: " ... to break the box and challenge the traditional teaching tradition".

Finally, the question on the concept of tangential learning got mainly positive response even if most teachers were not aware of the term, "don't know that concept" (Respondent 20) and "Certainly, and in particular if it could include several historical eras during a course" (Respondent 16). However, the answer from Respondent 6 was "I'm sceptic, they (students) are probably interested of other aspects of gaming".

Media types and teaching resources

Almost all respondents mentioned that they use various media types in their teaching sessions and some answers are "IT, visits outside school and films" (Respondent 23) and "I try to use videos, documentaries as well as recorded lectures" (Respondent 17). Furthermore, Respondent 11 wrote that "Films to grab students attention and sometimes as learning content as well. Documentaries as an introduction but also analyses of music and games".

Film/video was the most common answer to the question on complementary media and that they in particular are using documentaries. Digital games have much in common with film and videos but with the extension of a higher interactivity. According to some well-known GBL researchers the higher interactivity in games is the reason to why they should replace or complement film/video (Prensky, 2001; Gee, 2003). Furthermore, Papastergiou (2009) claims that games have a potential to replace most traditional educational media since it seems to be a more engaging way to acquire knowledge.

No respondent questioned the added value of interaction and the objection was rather the limited time frame, "It's so much that should be highlighted in such a short time, my estimation is 70% for historical eras, 20% for source criticism and 10% for the use of History" (Respondent 5). In another answer Respondent 28 described the limited time frame as "We are short of time, every part such as The Enlightenment, Discoveries, Revolutions, Industrialism and Imperialism get one week each". Another time shortage is that teachers have hard to find when they should play and analyse suitable games, "In a situation where teachers could play through a game planning for follow-ups and assignments based on the actual

game this would work fine, but that is not how it looks today" (Respondent 24). A third time aspect is that the total playtime of games often exceeded the time frame of teaching and learning sessions.

Suggestions from the respondents is to provide recommendations for various games and how they might be adapted to curricula. Finally, a teaching resource related issue is the cost of games, where Respondent 15 asks for "Availability and free of charge". Today, costs for games is not included in the budget for teaching resources.

Historical accuracy

In the answers to the question "How important is it that course material have a high degree of historical accuracy", several respondents thought it could be an advantage if games contained anachronisms to get discussions. But also with conditions like "It depends on the purpose, to teach historical époques and change processes facts have to be correct, but considering source criticism and use of History it would be interesting to analyse how History has been interpreted and used as a power tool" (Respondent 7). A similar answer from Respondent 17 was that "It could be excellent to discuss use of History based on actual anachronisms".

Several respondents answered that anachronisms could open up a debate on how History is applied in the contemporary society. On the other hand many respondents highlighted the importance of historical accuracy if games should be a complementary or replacement for other media types and Respondent 15 posited that "As soon as the historical accuracy fails teachers won't use the game". Furthermore, Respondent 3 wrote that "I find it decisive that the game has accurate details. For that reasons subject matter experts with knowledge both in History and Didactics should be part of a selection and recommendation process. And this, could of course, be better done by a team of domain experts".

There seem to exist two standpoints, one teacher group where historical accuracy is highly prioritised, and another that finds anachronisms as an interesting base for discussions. However, other media types are far from flawless and reasonable would be to set the standards for games as high as for other media types, and that some biased or inaccurate teaching resources could be used in debates on critical thinking or illustrating the use of History.

Insight into historical events

Many teachers answer to the question on what should be the most important to prioritise in History education with "the understanding of the connection between today and earlier eras". Why does the contemporary societies look like they do and which social, cultural and technological events have contributed. Respondent 12 and Respondent 18 described how they found it meaningful "Everytime that a student understood the alignment between the present and the past" and joyful "when students see the link between elder times and today".

There are also some suggestions on how this might be supported by GBL "To get in touch with ideas, persons and to dramatise changing processes" (Respondent 5). With the same idea Respondent 13 thought that "It (games) can be used to increase the understanding of an event, a process or phenomena (such as revolutions, democracy, dictatorship)". Finally, Respondent 17 wrote that "Games with choices and options are interesting from the teacher perspective, games where you 'experience' an era. Action games might be of use as well, but with the risk of a focus shift".

Teachers' gaming preferences

Half the respondent group wrote in their answers that they do not play games or have stopped playing. "Not now, but I did in the 1980s" (Respondent 29). "Not anymore, but earlier a bit of Total War long time ago Call of Duty" (Respondent 6). Other teachers mentioned that they had problems to find their way in the gaming jungle and a suggestion could be, as discussed under 4.2, to create a recommendation list with the help of domain experts.

In the gaming half Total War and Call of Duty were mentioned and so were several Role playing games (RTGs) "I play a lot of RPGs, adventures (and often with historical themes like Assassins creed) and simulations" (Respondent 8). "RPGs mainly" (Respondent 15) and among the more hardcore gamers "A lot of games, Red orchestra, Rising storm, Arma 2 & 3, the Total War series, Europa universalis are all favourites for a History geek like me" (Respondent 21). To summarise the majority of the preferred games could be classified as RPGs or strategy games, but there were also several occurrences of first person shooter games.

Game design

If the respondents' answers about appropriate game design should be summarised in two short, distinct answers it would be "Self-instructing" (Respondent 16), "Easy to learn, a convincing backstory and not too time consuming" (Respondent 22). Most respondents have an emphasis on high usability both for teachers and students. There are of course answers that highlights the importance of quality content, but the main focus is on that games should be easy to use and not too time-consuming which might make some of the bestselling AAA games to be a doubtful choice. Despite their engaging gameplay and detailed historical references they are often complex, time consuming and sometimes difficult to install. "As an example I think that Civilization is too time consuming" (Respondent 9).

The second focus is on games potential for engagement, "Simple, good structure and engaging" (Respondent 5) and "They should be engaging, make students think and solve problems. And to present historical events in a touching way." (Respondent 15). Third focus is historical accuracy and sometimes with the same arguments as described under 4.3 but also "As correct as possible, in combination with action and entertainment and if possible with theoretical parts on Swedish History" (Respondent 21). Some teachers tend to have a worst scenario with GBL based on games with lots of inaccuracy and confusing details.

To summarise, games should be design for usability, shorter gaming sessions and be engaging with convincing backstories without anachronisms or incorrect details.

Potential problems

Several problems were brought up in answers to the questions about games in teaching activities and the question about games as homework in flipped classroom setups. Common problems for both are technical problems and access to proprietary software: "Does everyone have access to the games, and how about hardware?" (Respondent 2) and "The main worry is technical problems" (Respondent 13). Another potential problem for both environments is the cost for purchasing games.

In the classroom setting the main issue is the time span, as discussed earlier under 4.6, "Max 40 minutes for gaming sessions, since lectures are 60 min and software installation, introduction and explanations take time" (Respondent 1) and "The game mustn't be too long to fit in to lessons" (Respondent 4).

Regarding the long game span in many of the most popular games the flipped classroom alternative seems tempting, but "Flipped classroom will certainly work in some schools but for me it's only about 10% of the students that do their homework, which would make the follow-up lesson pointless" (Respondent 11). There are also several answers questioning if all students have Internet access at home and the required hardware for AAA games.

CONCLUSION

Swedish secondary school teachers' attitudes toward game-based learning in History education can be summarised as:

- Teachers are mainly positive and optimistic toward GBL
- Traditional media types could be complemented with selected games of high quality
- There exist two different standpoints toward historical accuracy in games

- Teachers have a perceived lack of time in their daily work which might be an obstacle for GBL
- It is important that games, as all types of learning resources, can give insight in historical events and processes and point out connections between the past and the present
- Games must not be too expensive, since costs for games is not included in the budget for teaching resources. Neither should they be difficult to install or use
- Games for use in classroom settings should be possible to play in 40 min sessions
- Time consuming games are better used as homework in flipped classroom settings
- Teachers need support for technical problems and recommendations for game selection

Authors' recommendation for classroom settings is to use games that can be played in short gaming sessions having a potential to stimulate tangential learning. Games should be as historically accurate as possible and easy to install and use. The concept of a 'flipped classroom gaming' looks promising where students in longer gaming sessions with quality game content might have excellent learning outcomes if Internet access and hardware issues are handled. Finally, as pointed out by Holly Nielsen: "*Games don't need academic validation to sell, but academia needs to engage with games in order to modernise its approach to public history*" (The Guardian, 25/04/2017).

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