DIGITAL LEARNING

DIGITAL GAME-BASED LEARNING AND VIDEO GAMES IN TEACHER TRAINING. CONCEPTION, EVALUATION AND RESULTS FROM LEIPZIG UNIVERSITY

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ABSTRACT: By the beginning of the 21st century, media education on topics such as video games and strategies founded on the concept of Game-Based Learning has become an essential issue in school educational contexts. Continually rising standards in gameplay as well as recent developments in technology, in the gaming community, in the concepts and expectations of the potentials of gaming, have successively changed the perspectives on who is playing what, when and for what purpose, as well as on the consequences, opportunities and problems of gaming itself.

The authors of this article designed a seminar at the Faculty of Education at Leipzig University, in which different scenarios of playing computer games in school pedagogical contexts could be tried out, discussed and reflected on. The course was developed, tested and evaluated in cooperation with the Computer Gaming School Leipzig (ComputerSpielSchule Leipzig) before and during the summer semester of 2014. The aim was to create a situation in which future teachers and seminar instructors would be able to reflect critically on the opportunities, obstacles and challenges of a sensible integration of entertainment software (such as video games) in pedagogical teaching concepts. Theoretical and critical introductions to some selected issues concerning Game-Based Learning and computer games in general as well as hands-on gaming experience (gained in three practical sessions) provided the basis for discussion in the seminar.

Introduction

Around the turn of the 21st century, we witnessed a marked global digitization, especially in cultural communication. Over the last years, the pace at which new forms of communication, entertainment and networking have been established in society, has accelerated considerably. There was a shift towards digital structures, not only in everyday communication and interpersonal interaction processes (Johnson et al., 2013, p.8), but also in economics, where the effects of digitization can be seen in value chains and production methods e.g., or in governmental communication such as online petitions and administrative communication between citizens and local authorities, as is the case in many municipalities or districts in Germany (but not only there, of course). Some aspects of digitization have even become crucial in

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international affairs, for instance in the NSA surveillance scandal or the WikiLeaks revelations.

The digital transformation of society affects public communication (Linke and Zerfass, 2013, pp.270-274) and changes demand in terms of cultural and everyday skills or knowledge management (Long, 2013, pp.26-27) as well as the general theoretical reflections on what knowledge and cultural communication actually are.[1] It raises questions like *how do we recognize the world, how do we organize it* and *does digital socialization even exist*? The sheer magnitude of answers to these questions might constitute a bigger challenge for individuals[2] and society as a whole (Mukherjee, 2013, pp.9-11; UNESCO, 2002, p.14)[3] than other milestones in the past. In a nutshell: The digital reality and the virtual reality are a social reality (Geisler, 2010, p.168; Thomas and Brown, 2009, pp.37-39).

This paper aims to discuss the impacts and opportunities of an ever-changing digital culture in learning and learning contexts. This will be illustrated by presenting a seminar concept focused on *Game-Based Learning*, *video games* and *media literacy*. The concept's trial run was launched in the summer semester of 2014 as a seminar in teacher training at the Faculty of Education, Leipzig University. After discussing the theoretical aspects of the Protection of Minors, which is seen as an essential part of media literacy (especially in pedagogical contexts and with video games), we will present first results of the empirical seminar evaluation. Finally, we will discuss and reflect these first results, and outline our experience with implementing methods of Digital Game-Based Learning in teacher training and pedagogical contexts, and the opportunities they offer.

Learning, E-Learning and Digital Game-Based Learning at the beginning of the 21st century

The impact of a (partially) digitized culture on education systems and administrative politics also affects the theory and contexts of learning (Aust et al., 2013, pp.261-263; Brown, 2013, pp.13-15), especially in higher education (Gea 2012, 41-42). According to Prensky (2013), learners and the learning community have changed, too. Hence, the framework which has been developed at the beginning of this text, leads us to the four main fields of interest this seminar concept revolves around: the relevance of video games for educational contexts, (e-) learning, Protection of Minors (in Germany) and Digital Game-Based Learning.

Relevance of video games in educational contexts

Continuously updated data (collected by *Medienpädagogischer Forschungsverbund Südwest*[4]) show that playing video games is enormously popular with children and adolescents in Germany. 62 % of all children aged six to thirteen play video games at

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[1] This is not only a characteristic of western cultures. A shift can be seen worldwide, as (e.g.) in the debates and the impact of rankings of schools or education systems such as PISA (Figazollo, 2006, p.3).

[2] The individual adaption to developments as described above can also be discussed from the perspective of life-long learning (see Aust et al., 2013, pp.261-262). For an approach to the critical debate on the emergence of life-long learning as a policy-making tool for politicians and governmental processes, see Ioannidou, 2013, pp.375-383.

[3] There is still an ongoing debate in the scientific community about which kinds of events might be identified as turning points marking these changes and processes. For example, the development of "Web 2.0" (O'Reilly, 2005) or the point when smartphones, as they are known today, reached mass market maturity (when the iPhone was introduced by Apple Inc. in 2007), can be seen as such turning points.

[4] English: Media Education Research Association Southwest.

least once a week. Only 25 % of the interviewees (n=1209) in this age group report never having played a video game (*Medienpädagogischer Forschungsverbund Südwest,* 2015, pp.53 & 74-77). The results for children aged twelve to nineteen are similar. 84 % of all interviewees play video games once a week or more often *(Medienpädagogischer Forschungsverbund Südwest,* 2014, p.41). Because of the rising number of users as well as the increasing availability of software (applications, video games, websites) specifically designed for children and adolescents, or attractive to them, the Council of the Education Ministers of the 16 German federal states (*Kultusministerkonferenz)* passed a resolution that makes the development of media competence a major responsibility of all primary and secondary schools in Germany (*Kultusministerkonferenz*, 8 March 2012). The Council defined…

…media education as part of the educational mandate of schools because media competence is yet another cultural technique, on a par with reading, writing and arithmetic. (*Kultusministerkonferenz*, 8 March 2012)[1]

In spite of a wide range of 'serious' approaches to digital gaming and video games (e.g., Ganguin, 2012, pp.13-14), there are also some scientific representatives or experts in the German debate who argue that digital media and digital contents have a negative impact on cognitive development, especially in children (Spitzer 2012), or will cause violent aggression against others (Mößle et al., 2006). Although the theoretical and empirical bases of this kind of "research" often lack transparency and raise doubts regarding their methodology (Schmidt et al., 2011; Lampert et al., 2011, pp.122-133), these and similar voices have gained some public attention (Kegel, 2007; Spiewak, 2012).[2]

In order to make future teachers aware of how popular video games are (and why) and how they permeate everyday life; in order to show up and discuss the opportunities and limitations of Game-Based Learning concepts and to enable students to reflect and question unscientific, populist (or generalized) perspectives on video games, a stronger focus on media education in future teacher training (in Germany) is needed.

(E-) Learning

Several processes in cultural digitization lead to phenomena which can be found in the literature under keywords such as 'new knowledge', 'web generation' or 'digital natives'[3] (Aust, 2012, pp.130-131; Melville et al., 2009, p.6; Ridder and Turecek, 2011, p.570). New groups like 'digital natives' have evolved from common social experience, competences and resources, all closely related to the development of digital media (Freitas, 2008, p.13; Hughes, 2009, p.34; Prensky, 2013, p.79). The debates about concepts and contexts of e-learning[4] or sub-concepts such as media literacy, media

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[1] Translation by the authors.

[2] Here, the authors are referring to the German debate on "killer video games" and "media education" of the last decade.

[3] For a critical debate about the label of 'digital natives' vs. 'digital naïves' see Bennett et al., 2008 and Schulmeis-ter, 2009.

[4] From the authors' point of view, it is not possible to separate "e-learning" from any other kind of learning involving digital media by labeling this kind of learning with an "e" for electronic, enhanced or whatever "e" might stand for (or "m" for mobile). The authors follow the assumption that there is no separation between learning with or without electronic media and devices or digital resources and contents.

education and media competences, are antiquated and more or less obsolete (Aust et al., 2013, 261). The question is no longer if there is a shift in progress - it has already occurred (Johnson et al., 2013, pp.9-10). It seems worthwhile to think about how to make use of these media competences within educational contexts. One interesting point of discussion might be whether the competences *to verify resources and knowledge* or *to navigate through (digital?) structures in order to access information* should be seen as more valuable and more important than issue expertise itself (Melville, D. et al 2009, 34; Müller et al., 2013, pp.1-2).

On the other hand, the concepts of media literacy and media culture continue to evolve. Learners' experience and expectations are changing, too, and affect the roles of teachers and pedagogues (Aust, 2012, p.130; Aust et al., 2013, p.263; Melville et al., 2009, p.39). It is evident that teachers and pedagogues have to adapt to 'new' competences such as media literacy and media education and should be capable of connecting to their students' everyday life experiences. Hence, it seems to be essential for media education and media studies to form part of teacher training at higher education institutions.

Digital (Game-Based) Learning

One of the most dynamic fields within the digitization of everyday life is that of (digital) games (Adachi and Willoughby, 2013, pp.1041-1042).[1] The approach (Adachi and Willoughby stand for) slightly changed the pedagogical perspective on gaming and the way some pedagogues think about education. Gaming (also video gaming) is now seen as a constructive part of learning concepts (Ganguin, 2012, pp.16-17).[2] Training concepts of gamification and DGBL were even implemented in companies for human resources development (Werbach and Hunter, 2012, pp.9-11).

The approach of learning through video games (Prensky, 2013) claims that knowledge can be gained and experiences can be made in virtual contexts - and that these, in turn, open up new aspects and opportunities of learning and learning contexts (de Freitas, 2008, pp.13; Ganguin, 2012, pp.16-17; Gee 2008, pp.229-230).

Course structure

After deciding to put the potential of using video games in educational and pedagogical contexts under scrutiny in a seminar, several requirements had to be taken into account.

Firstly, it seemed necessary to introduce students to the German system of the Protection of Minors (PoM) from potentially harmful media contents and to elaborate on the importance of PoM. Secondly, practical gaming phases in the seminar, allowing for students to gain their own experience with games, had to be planned and designed in such a way that they could be connected to theoretical discussions. Thirdly, it had to be determined which kinds of games might be suitable with regards to the aim of the seminar. Fourthly, since English was chosen as the language of instruction for all sessions, we had to ensure that all materials, texts, lectures and software were compatible (i.e. in English), even though there are some issues which are rather specific to Germany, such as the legal dimensions of the Protection of Minors in Germany.

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[1] Also see Nitsche, 2012 and Sanford et al., 2011, p.50.

[2] Also see Johnson, Brown & Adams Becker, 2014, p.42; Prensky, 2013, pp.88-100; Quitney Anderson, & Rainie, 2012, pp.2-3).

Protection of minors - conditions of PoM concerning digital gaming in Germany

Due to a highly differentiated federal system, especially of the legislative and the executive branch, the Protection of Minors (PoM) in Germany is regulated by different public and private institutions, and by laws which are enacted either by the Parliament of the Federal Republic of Germany (German *Bundestag*) or by a council of representatives of authorities of all 16 federal states. It is related to many public affairs, such as advertising, private and public broadcasting, pedagogical contexts and school education. Teachers will have to deal with concerns of PoM whenever they use media, be it movies, books, images, illustrations or video games. Therefore, the seminar started with an introduction to the basics of PoM in order to provide a perspective on media that future teachers will need when working with minors such as students, or children and adolescents in general.

Depending on the kind of media (broadcasting, private television, movies, video games, websites (hosted in Germany), among others) and the kind of executive act they require (age rating, restrictions and conditions of distribution, prohibitions etc.), different governmental institutions or agencies of the federal states are in charge of PoM. Based on the Interstate Treaty on the Protection of Minors (German: *Jugendmedienschutz-Staatsvertrag,* Federal States of Germany 10.09.2002), age rating for video games available for purchase in Germany is executed by the Entertainment Software Self-Regulation Body (German: *Unterhaltungssoftware-selbstkontrolle*, abbreviated as USK). It is financed by the two most important German games industry associations (GAME[1] and BIU[2]) and provides the physical and administrative infrastructure for all age rating processes. The decision on which age category is given to a game is made by councils consisting of four experts[3] from different GOs and NGOs. Each council is headed by one of the two Permanent Representatives of the federal states.[4] Although the USK is funded by the gaming industry, it is not possible for industrial representatives to influence or lobby any of the council's decisions. This is guaranteed by the independent experts, the Permanent Representatives of the federal states and by federal laws.[5] Besides, publishers or producers are not obliged to hand in video games to the USK. However, if a video game is not subjected to the age rating process, it must not be advertised, displayed in stores or sold to minors (under 18).

There are five different age rating symbols[6] for video games, each referring to a specific age range. They are different from the symbols of the Pan European Game Information (PEGI).[1]

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[1] G.A.M.E. *Bundesverband der deutschen Games-Branche e. V.* (Engl.: G.A.M.E., the German Games Industry Association).

[2] BIU - *Bundesverband Interaktive Unterhaltungssoftware e. V.* (Engl.: German Trade Association of Interactive Entertainment Software (BIU).

[3] Altogether, there are about 50 appointed experts working with the USK.

[4] There are two administrative representatives at the USK who are called Permanent Representatives of the Supreme Youth Protection Authorities of the Federal States *(Oberste Landesjugendbehörden – OLJB) at the USK*.

[5] For further information concerning the age rating process or the different members of the USK see: http://www.usk.de/en/.

[6] Besides the five age rating symbols, there is a sixth symbol, which is used for educational software. Given that a certain game has been programmed specifically for educational purposes, publishers may have the symbol printed on the software packaging and the data storage device itself, without having to pass the age rating process.

FIGURE 1. USK SYMBOLS, 2014

Every publisher is required to print on the game packaging as well as on the data storage device itself the symbol representing the age range determined by the rating process. It is worth mentioning that the rating symbols do not give information on whether a game is, or is not, deemed appropriate for a child or an adolescent. Rather, it provides information on whether game contents are potentially harmful for the emotional and intellectual development of children or adolescents of a certain age range.[2] Therefore, the decision on which kind of symbol is given to a game depends on several parameters, such as the narrative setting, historical or fictional gaming contexts, relation to reality, degree of violence, level of competitiveness, moral and ethical principles which might be transported etc.[3]

Recent developments in gameplay as well as in the ways of distribution and payment systems have revealed a certain weakness of the USK. Based on the Interstate Treaty on the Protection of Minors, the USK is responsible for the rating process of "entertainment software" which is provided via media storage devices such as CDs, DVDs, Blue Ray Discs or even Flash memory sticks (image carriers, see Article 12, Federal States of Germany 10.09.2002). Media content, such as games and even games apps, which are exclusively distributed via download or which can be played in a Browser via Flash or HTML 5, are excluded from the rating responsibility of the USK. Thus, there is a fast growing number of very popular video games which are not

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[1] For more information on PEGI see: http://www.pegi.info.

[2] To illustrate the difference: Based on a decision of one of the USK councils, there is no minimum age for the German version of *2014 FIFA World Cup Brazil* (EA Sports 2013). It was therefore rated as "0". Of course, a newborn would not be able to actually play FIFA 14. However, according to the criteria of the USK, humans of any given age will not be harmed by seeing, hearing or (otherwise) experiencing elements of the game.

[3] For more information about the rating process or the different criteria for the respective age rating symbols see: http://www.usk.de/en/classification/age-rating-symbols/ [18.05.2014].

required to pass any rating process in Germany, without any consequences for distribution.[1]

Theoretical and practical synthesis in the seminar design

On the one hand, a theoretical basis had to be established to discuss video games as a means to fulfill academic needs. On the other hand, it seemed hard to imagine how a seminar named "Digital Game-Based Learning and Video Games" could be conceptualized without also actually playing games. In order to accommodate for both the theoretical and the practical approach, the seminar was designed to consist of four thematic blocks containing up to four sessions each, and a general and thorough reflection at the end of each block. Within the first block, students and seminar facilitators were to discuss the concept of Game-Based Learning and POM, whereas the three following blocks were separated into three phases (sessions) each: the first one for a theoretical approach, the second one for practical gaming and the third one to discuss the conditions for a successful implementation of games, some of their elements or a gaming concept in pedagogical and/or school educational contexts[2]. Hence, each block focused on a certain game or a certain game concept as well as on suitable literature references.

Within the first block of four sessions, students were introduced to the basic aspects of *Game-Based Learning*[3] and the *Protection of Minors*. For a discussion of legal, administrative, moral and practical aspects of PoM in Germany, one of the two Permanent Representatives of the federal states at the USK (see above) was invited to participate in at least one session. Approaching a highly complex issue (such as PoM) from an inner perspective was expected to be challenging, due to the high amount of information that needed to be conveyed. But it provided the students with the opportunity to debate even critical aspects with the representative of a high administrative level in Germany and to experience first-hand what working with and on PoM is mostly like: a discussion on its legal bases and a constantly changing debate within society.

Games we wanted to focus on in the following three thematic blocks had to fulfill a number of criteria. Firstly, since the aim of the seminar was to discuss the pedagogical and educational potential of popular video games, we excluded games that had been specifically "made" for learning purposes. Moreover, we preferred game content that was in some way "obviously" relevant for pedagogical and school educational contexts.[4] Through this selection process, we found and discussed many games that

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[1] For example, one of the most popular games in 2012 and 2013 in Europe and in Germany has been *League of Legends* (Riot Games, 2009), which is distributed online except for retail collector's editions. Nevertheless, Riot Games requested a rating process at the USK to present game content at the biggest fair for entertainment software, *GamesCom,* in Cologne in 2011, in order to comply with the standards of organizer BIU (see above).

[2] The three thematic blocks where subdivided into three sessions each, with phases of theory (reception), gaming experiences (production) and discussion (reflection) (Aust, Bothe & Murata Arendt 2013, 263; KMK 2004, 2).

[3] Within the seminar, the concept of (Digital) Game-Based Learning has been discussed via Prensky, 2013 and Ganguin, 2012.

[4] There is no doubt that a wide range of competences can potentially be gained by playing video games. But we also had to consider the needs of future teachers. Therefore, we searched for games matching school educational subjects in the broadest sense, such as History, Social Studies or Biology. For further perspectives on games and learning see (e.g.) Gebel et al., 2004; Squire and Jenkins, 2011; Ganguin, 2012 or Johnson, 2012.

we considered to be appropriate for the seminar. Then, we drew up a short list of games which could be played and discussed against the backdrop of school education and PoM, and which might touch school subjects more obviously:

Various Browser Games (second block)[1], *Anno 1404* (Related Designs, Blue Byte 2009, third block) and *The Walking Dead* (Telltale Games 2012, fourth block).

Playing flash games

According to *alexa.com*[2], many Flash game providers run extremely popular websites. *Kongregate.com,* e.g., is one of the biggest providers of free-to-play browser games and has a global *Alexa rank* of less than 1300, which is quite high[3]. It means that kongregate.com is one of the 1300 most visited websites worldwide. In spring 2014, kongregate.com even reached a global *Alexa* rank of about 800.[4] Similar results can be found for other providers such as *Spielaffe.de*[5] (the German gaming industry leader in providing free browser games) or Armorgames.com[6]. Unfortunately, there is not enough room in this paper to discuss the whole range of possible reasons for the high popularity of browser games. However, it is evident that browser games are played by a large number of people. At the same time, there is a growing uncertainty about how to handle a media phenomenon such as browser games or related gaming applications, which is, as yet, not covered by administrative regulations concerning PoM. Because of the high popularity of playing video games via browser or smartphone apps, it seems appropriate and necessary to discuss this specific, and largely underestimated, challenge with future teachers within the context of pedagogy and school education.

As a theoretical approach to the first thematic block, the seminar also discussed Jane McGonigal's perspective on the potential opportunities of gaming for society in general on the basis of a short presentation of hers at the Conference of Technology, Entertainment and Design (TED) in 2010 (McGonigal, 2010). There, McGonigal had suggested that the high amount of time people invest in playing online games worldwide (about 3 billion hours per week, McGonigal, 2010) might be used to solve complex problems, such as local or regional supply problems in the fields of energy or food. The idea was to establish collective problem solving structures by means of games and to use familiar gameplay patterns for online games and various strategies that have proved to be successful (such as in-game networks, achievements, clans,

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[1] *Minim* (Sheeler und Lapointe, 2009), *Candy Crush Saga* (King Digital Entertainment, 2012), *Continuity* (Holmlid et al., 2009), *Wonderputt* (Millidge und Damp Gnat Ltd 2011), *3D Logic* (Matveev und Harvey, 2004), *Bloons Tower Defense 4* (Kaipasoft, 2009), *Hello Worlds!* (Snider, 2010) *Crush the Castle 2* (Betz und Condon, 2010) and *The Company of Myself* (Piilonen et al., 2008).

[2] *Alexa Internet* is a market research company which collects and provides global statistical data on website accesses and user groups. Alexa Internet is part of *amazon.com, Inc.* Similar services are also provided by several other companies, such as *similarweb.com*.

[3] Taking into consideration that a global Alexa rank of 10.000 or less counts as popular or "valuable".

[4] http://www.alexa.com/siteinfo/kongregate.com [23.05.2014], Global ranking on *similarweb.com*: about 450. (http://www.similarweb.com/website/kongregate.com_[02.06.2014]).

[5] Global Alexa ranking: about 7500 (about 6200 in spring 2014, national ranking: about 400). http://www.alexa.com/siteinfo/spielaffe.de [23.05.2014].
Global ranking on similarweb.com: 5000 (http://www.similarweb.com/website/spielaffe.de [02.06.2014]).

[6] Global Alexa ranking: about 2000 (about 1900 in spring 2014). (http://www.alexa.com/siteinfo/ armorgames.com [23.05.2014]). Global ranking on *similarweb.com*: about 970 (http://www.similarweb.com/website/armorgames.com [02.06.2014]).

completion, collective creativity, common purpose etc.) to keep players motivated. As examples, McGonigal invoked three gaming projects that have been conducted since 2007. Projected into more or less fictional contexts, these games confronted players with current or future problems of regional or global scope. Players were asked to solve them by developing strategies in order to handle challenges such as peak oil, to reorganize the distribution of resources (food, energy, water etc.) or to gain social skills in general (McGonigal, 2010).[1] Although first results seemed promising, there is, as yet, no evidence of the efficacy of those strategies outside game contexts.[2] McGonigal identified another joint project as an example of the collaborative capacity that can be achieved by video games: *wowwiki.com*, an ad-financed (fan) Wiki project covering the video game *World of Warcraft* (Blizzard and Activision Blizzard, 2004) and providing more than 100.000 articles. This makes it one of the biggest online knowledge databases worldwide.[3]

As gaming seems to be an incentive to spend and invest time as well as knowledge, competences and creativity, the seminar debated McGonigal's ideas on the basis that goals less broad in scope than 'saving the world' might be set to start with. All participants discussed whether the understanding of gaming time as a valuable resource could be somehow transferred into school educational or school pedagogical contexts. The discussion included theoretical elements such as McGonigal's approach and the terms of PoM as well as a practical gaming session in which participants had played various Flash games themselves (see above). Those games were chosen as the first items of practical gaming because of their high popularity and their rather low threshold (concerning gameplay, complexity, handling etc.), which made them suitable for less experienced players, too. Furthermore, there is a close conceptual relationship between numerous Flash games and gaming apps for Android or iOS which is reflected in a high number of ports from Flash to iOS/Android or vice versa. The games were chosen because of their popularity, or the popularity of the genre they belong to, but the selection may not be representative for all game genres that can be found among Flash games.

Anno 1404

In the third seminar block, students discussed the game *Anno 1404* (Related Designs, Blue Byte 2009). Because of several game contents that might be relevant for school subjects such as History, Economy or Social Sciences, Anno 1404 was suitable to be discussed and evaluated as a more complex game. In preparation, the seminar talked about an experiment conducted by Kurt Squire in 2006 where he explored whether historical games could be used as part of history lessons (Squire und Jenkins, 2011, pp,109-139). Imbedded in a unit on world history, Squire let 9th grade students play several sessions of Civilization 3 (Firaxis 2001), a round-based strategy game, to illustrate historical issues such as cultural expansion, geographical influences on settlements, effects of superior technology, different forms of government, public financing, geopolitics, diplomacy, historic military strategies etc. After some initial difficulties, Squire's experiment turned out to be a success. Pupils began to discuss historical developments by replaying or "changing history" as well as the conditions and alternatives of historical processes. For instance, one of the questions that arose in discussions was why the people or the leaders of the African Bantu kingdoms had

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[1] McGonigal elaborates her perspective in detail in McGonigal, 2012.
[2] See description of these projects in McGonigal, 2012, pp.219-344).
[3] Alexa rating: less than 10.000 (http://www.alexa.com/siteinfo/www.wowwiki.com [23.05.2014]).

not tried to conquer Europe. Interestingly, this is a possible scenario in Civilization 3 (Squire and Jenkins, 2011, pp.126-127).

Squire exemplifies how games like Civilization 3 can be implemented in educational contexts, for instance as gate openers. Despite the promising results of Squire's approach, the seminar on "Digital Game-Based Learning and Video Games" decided to play Anno 1404 instead of Civilization 3 for two reasons. For one, Squire's experiment had taken many weeks. Secondly, Anno 1404 presents many relevant elements such as value chains, architecture, social strata and trading, which are some of the most vital developments in a medieval society, in a much more vivid fashion. It should be noted, though, that it deals less with diplomacy and geography.

In Anno 1404, the player takes on the role of a noble Commander in Chief in an occidental, medieval setting. His task is to settle islands, to gain access to various resources and to grow and develop infrastructure and the population. Resources are needed for at least three purposes: for trade and production and to satisfy the needs of the population. With the number of inhabitants and the amount of state revenue increasing (through more taxes), the extent of the population's needs will increase as well. The population is divided into two "hemispheres" (Orient and Occident) and six civilization levels. Every level leads to higher state revenue but also to the emergence of new needs which must be fulfilled in order to reach the next level of civilization. While it is quite easy to produce all the physical, social and religious supplies for the lowest civilization level on the player's first island (food, wood, society and religion represented by a chapel), the second civilization level demands goods (e.g. spices) which cannot be produced on occidental islands. To solve this problem, the player is forced to either trade goods with friendly supporters and more or less cooperative opponents, or to start a new settlement on an oriental island. This would require "diplomatic relations" with an oriental representative to get permission to establish a permanent trading route for ships.

Due to the economic, infrastructural and social development of the islands, among other things, the player will be confronted with many different physical and social needs such as books, glasses, different kinds of clothing, jewelry, alcohol, monuments, education and religion. These highly demanding needs can only be fulfilled by exploiting new resources on other islands and by establishing a processing industry as well as complex and profitable trading routes. In addition to that, the player has to keep the financial balance between income and outgoings positive, while at the same time having to defend him- or herself (militarily or economically) against opponents competing for resources.

Anno 1404 potentially correlates with a number of school subjects and illustrates several elements which might be relevant in school subjects such as Economy (for instance: value chains, trade routes or hierarchy of needs), Social Sciences (for instance: social strata) or History (for instance: urban development, intercultural dependencies, importance of trade in medieval European societies) etc.

The walking dead

The Walking Dead (Telltale Games 2012), which was chosen as the final game to focus on in the fourth block, confronted participants with a self-imposed problem: *The Walking Dead* has been rated '18' by the USK and would therefore be unlikely to be used in school contexts. Yet, as an 18-rated game, it is an appropriate example to discuss the conditions or regulations of the highest PoM rating symbol for video games in Germany. Moreover, it illustrates how a narration can be transposed from a

graphic novel into a video game, and, within the debate on 'serious games', it exemplifies possible options. Apart from the question whether there is actually a difference between gaming in general and 'serious' gaming[1], a discussion about *The Walking Dead* might (probably) weaken an old-fashioned perspective on games assuming they are developed for either entertainment or learning purposes.

The Walking Dead is rooted in the tradition of Point-and-Click Adventures and is based on a graphic novel series of the same name by Robert Kirkman, Tony Moore and Charlie Adlard. Similarly to the graphic novel, the player's character finds himself in the middle of a pandemic disaster, which transforms human beings into furious and lethal un-dead (also known as zombies). Being part of a group of survivors, the character has to travel close to the former US city of Atlanta, while fending off attacks by the un-dead. Throughout the detailed and emotionally compelling story, the player will be forced to take hard decisions in moral and ethical dilemmas. These decisions may be guided by altruistic as well as selfish motivation (e.g. saving a boy from a zombie attack and letting a companion die (or vice versa) or hesitating to save a girl out of fear or uncertainty). Every decision will have irreversible, and sometimes severe, effects on the whole of the narration, on relationships between characters, or even on the further existence of some characters in the plot.

Games using moral and ethical dilemmas as narrative motives (like *The Walking Dead*) will include caesuras in the gameplay in order to "switch off" intuitive gaming and to allow players to make presumptions on the possible consequences of their actions as a character on an emotional level (Sicart, 2013, p.31). As one of several other possible strings, playing *The Walking Dead* in the seminar was meant to open (up) a discussion on whether the construction and the complexity of moral and ethical dilemmas could be illustrated by playing 'serious games' of that kind. It might also provide an approach to questions about the origins of moral or the limitations of standards of social behavior or the justification of violence or even homicides as a last resort to defend and/or protect oneself or others. This might, in turn, provide interesting insights in issues such as the *social contract* for subjects like History or Social Studies, keeping in mind though, that this game could only be provided to students of legal age.

Evaluation concept

Since this seminar was the first one dedicated to video games in teacher training at the Faculty of Education, it was deemed necessary to evaluate and reflect the progress and outcome of the seminar in an on-going process. While the seminar's module has its own methodological approach of evaluation (Brock et al., 2014), a more focused and seminar-related evaluation strategy was needed. Two pillars were established for the evaluation of the seminar:

- Student-related feedback
- Reflection on team-teaching

Both aspects have in common that they are carried out as soon as possible after seminar sessions. This evaluation strategy could be best described as a mixture of *summative* and *formative* (Flick, 2006, p.14) elements. Summative evaluation could be seen as a method focused on finalized processes; formative evaluation can be used within processes and therefore offers the opportunity to adopt and further develop these processes (Tan et al., 2010, p.4).

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[1] See e.g., Fromme et al., 2010, Mouaheb et al., 2012 or Ganguin, 2012.

1. Student-related feedback

With current evaluation concepts centered on the quality of universal education, it is important to keep in mind that students are the main protagonists in this field. According to Herfter (2014), students' responses are the ones of highest value in the evaluation of academic teaching (Herfter 2014, p.19). A qualitative evaluation approach would fulfill two requirements for the seminar: focusing on its experimental character as well as on student responses (Herfter, 2014, pp.136-141). For experimental seminar concepts, it is necessary to adopt an evaluation system that applies explorative methods and is open for information and feedback from the students. Qualitative student response-focused evaluation is, by all means, a practice-oriented research approach (Flick, 2006, pp.36-37), aimed at focusing on the students', as well as on the teachers', perspectives (Brock et al., 2014). In order to engage the students in continuous feedback and response, we decided to apply a free-to-use and easily accessible software tool called *letsfeedback.com*.[1] It allows for lecturers or teachers to open an account to create a questionnaire which can be accessed with a simple code and does not require registration. In contrast to comparable software such as *Moodle* or *Mahara, letsfeedback.com* also runs on mobile devices and provides different options to save evaluated data and questionnaires and to download the gathered data in pdf format.

In addition to the evaluation concept by Brock et al. (2014), we worked out three periodically asked, open questions in order to get more detailed and specific feedback from the students. Students were able to give comprehensive feedback on every session of the seminar immediately afterwards. The three questions were:

- What did you like about this seminar?
- What didn't you like about this seminar?
- Where do you see room for improvement?

Over the course of the seminar, we added some more specific aspects to these three questions, e.g. "What did you like about this seminar, *especially about the game-time part?*"). Students were free to attend *letsfeedback.com*, and the questionnaire was completely anonymous. In other words: students were not required to answer all the questions. It was also possible for students to ask questions addressed to the author of the evaluation questionnaire.

2. Team-teaching reflection

In reference to the general meaning of team-teaching concepts (Anderson and Speck 1998, 672-673) within higher education, we reflected on the progress and contents of any session immediately afterwards. Taking into account the seminar's concept, its aims as well as upcoming sessions, we discussed the results, positive and negative aspects as well as our own contributions and performance.

We included a part called "recap" in every session where we would a) give the students feedback from *letsfeedback.com*, together with some comments from our side and b) reflect on our own thoughts. If necessary, we jointly discussed if any improvements were needed or if any other aspects ought to be taken into consideration for the whole of the seminar or upcoming parts of it.

For the development of the seminar, we predicted, on the basis of formative evaluation approaches, that analyzing questions such as "What did people say?"

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[1] *Letsfeedback.com* was invented in 2013 by Deniz Demirsoy of the *Dual Citizen company*. *Letsfeedback.com* is a public funded and cloud-based student/audience response system.

would be more relevant and important than analyzing questions about individual behavior and sense structures. Qualitative Content Analysis by Philipp Mayring (2000, 2003) was chosen as the method of analysis. It provides three separate strategies of *summarizing*, *explicating* and *structuring* (Mayring, 2003, p.58) qualitative content: They are part of "[...] an approach of empirical, methodological controlled analysis of texts [...]" (Mayring 2000, p.5). Through content-analyzing approaches in which quantitative and qualitative aspects are intertwined and by combining the three strategies mentioned above, it is possible a) to reconstruct subjective opinions and narrations from a comparable perspective and b) to quantify and rate these reconstructed phenomena (Mayring 2000, p.5).

First impressions of seminar evaluation (as of June 2014)

1. *General data*

In the summer term of 2014, 22 (Teacher Education) students[1] attended the seminar "Game-Based Learning and Video Games". The subjects students studied ranged from History, Biology or Physical Education to English as a Second Language, Ethics or Musicology. The variety of school types they prepared to be teachers for was not as heterogeneous; future teachers for *Gymnasium*[2] was the most strongly represented group, with 19 students. From the beginning of the summer course in April 2014 through June 2014, an average of ten students visited the seminar regularly. For the analysis of the evaluation, ten data sets are available.

2. *Students' perspectives*[3]

Positive impressions

The overall set-up of the seminar (theoretical, text-based introduction, gaming and reflection-discussion) and the quality of the content and seminar material selected got mentioned most frequently as structure-related aspects.

"[…]the discussion was very nice" (DGBLeval_02/2)

"[…] text we had to read (...) was a really good basis" (DGBLeval_05/1)

As the seminar progressed, some students pointed out that they saw a shift in their perspective on video games, especially concerning the use of video games in school pedagogical contexts.

"[…] I'm getting more and more addicted and [developing] a feeling for possibilities of games within school contexts" (DGBLeval_05/1)

This is interesting, seen against responses to the second question[4] in which students had emphasized, at the beginning of the seminar, that they were missing a practical link between the seminar content and pedagogical contexts.

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[1] Of which 13 were male and 9 female.

[2] "Gymnasium" is similar to former British Grammar Schools and provides access to higher education after successful graduation.

[3] The quotes are represented in the way students submitted them to letsfeedback.com. Spelling mistakes have not been corrected subsequently.

[4] For example, from the questionnaire for June, 4th: "What didn't you like about this seminar (04.06.2014), especially about reflection and discussion related to Anno 1404 and possible scenarios within pedagogical contexts?" (open question).

"Even so it has yet no connection to school lessons, […]" (DGBLeval_04/01)

"[…] the 'practical approach'" (DGBLeval_02/2)

Also, constantly including students' perspectives as an active and essential part of the seminar necessary for the seminar to progress was often positively highlighted by students. It is important to mention, though, that these discussions were controversial and included divergent opinions.

"[…] positive that everyone's opinion's [sic] *and thoughts were welcome."* (DGBLeval_02/2)

"[…] open mindedness [sic] *& credibility of the people who conduct this seminar."* (DGBLeval_01/1)

"[…] it was quite controversial, which is always good." (DGBLeval_05/1)

It seems mandatory to treat students' perspectives as a main outcome of the seminar. However, the aspect of *discussions* is relevant for and an important part of teaching and learning cultures, but is, unfortunately, not always a given in higher education teaching scenarios (Herfter, 2014, pp.194-196).

Suggested Improvements

Some students held critical views regarding the practical relevance of video games as well as the provided theoretical content for pedagogical contexts, and gave responses such as:

"[…] still no clue how to include gaming in school lessons" (DGBLeval_03/2)

Additionally, the open discussion setting was, in some cases, highlighted as a negative aspect of the seminar that needed to be addressed.

"During discussions[,] topics are changing quite often" (DGBLeval_05/1)

Concerning the seminar's main topic, "Video Games", some students' limited or even missing gaming experience was not seen as a disadvantage (in correlation with commitment and frustration), but as an aspect that needed to be taken into consideration in discussions as the seminar progressed.

"[…] engage more students […] non [sic] *experiences within gaming"* (DGBLeval_02/2)

"[…] because it was too game-related sometimes" (DGBLeval_01/1)

"[…] have to keep motivating those, [sic] *who don't have any gaming experience"* (DGBLeval_01/2)

With the seminar proceeding further, negative feedback decreased and the answers to questions for improvement changed to "nope", "none" or not being given at all.

3. *Teacher's perspectives*

Compared to the students' responses, the teachers discussed more or less the same thoughts and impressions concerning positive aspects of the seminar or aspects that needed improvement. We constantly discussed the practical relevance of different seminar aspects and the sensitivity of the students and their commitment to game-based learning concepts.

One major aspect we discussed, and which remains important for the quality of the seminar, was not brought up by the students themselves, though: English as the language of instruction, and the students' and teachers' English skills. As most students and all teachers were native speakers of German, it was quite a challenge, in the beginning, to keep speaking English in all relevant sessions. It was also challenging

for some students because German is the common language in future teacher training for schools in Germany. This also influenced theoretical discussions and the assessment of relevance for school pedagogy.

The three seminar teachers would describe themselves as advanced speakers of English, while in the students' group, English proficiency ranged from very advanced to school level. Therefore, it was important to provide enough room and time for all students to express their thoughts, regardless of their language skills. In order to ensure this, we tried to reduce group pressure and to establish a democratic, respectful and supportive atmosphere in the seminar.

Interpretation and discussion

As pointed out in chapter II, the emergence of aspects of learning at the beginning of the 21st century such as 'new knowledge' or 'digital natives' and the opportunities of Game-Based Learning settings with computer or video games, are evident and must be reflected on and taken into consideration for higher education as well. As we know from first impressions of the seminar evaluation, many students considered video games to be important for school and pedagogical contexts in general, but for very different reasons.

The seminar instructors do not yet know for sure why about half of the students dropped out. Reasons we could think of were the seminar topic, language barriers, the didactical concept or the fact that there was no mandatory test and no grading at the end of the course, which might make the course seem less relevant.

At the beginning of the seminar, we organized a *speed dating* as part of getting to know each other. One of the questions we asked was how the students felt about English as the seminar's language of instruction. Some students agreed that a) it was challenging but b) they appreciated the opportunity, especially for teacher training and in pedagogical seminars. Others mentioned that they had chosen this seminar specifically because English was the language of instruction. It is important to also accommodate students with a) less experience in video games and b) less advanced English skills. It was important, as the students pointed out, that a wide range of different opinions on several issues could be expressed and discussed. Although English as the language of instruction may have its challenges, it will be maintained as the seminar language because, so far, relevant contributions on Game-Based Learning have mostly been published in English. Moreover, the processes of internationalization of Teacher Education Studies have to be taken into account, and the Faculty of Education in Leipzig is set to open more courses for international students starting off with less advanced skills in German.

For us as heads of the seminar, it was most valuable to open the discussions for different perspectives in order to build and maintain vivid dynamics in the group. It might be important, e.g., to take into consideration the perspectives of students who are less experienced in gaming. For a discussion about the opportunities and limitations of games in school contexts as well as for a debate on violence depicted in the games and the general meaning of gaming for culture and society, a wide-ranging discussion is indispensable.

The evaluation has shown that media literacy, and especially Game-Based Learning concepts and video games are assumed to be relevant aspects for future teachers. Of course, there was a wide range of reasons for this assumption among the students, from facing dangers of gaming or its misuse to chances and changes that go along with the increasing presence of (digital) gaming in everyday life.

Media literacy and media competences nowadays could be labeled as mandatory parts of living and teaching. However, research indicates that there is still (some)

room for improvement, especially in the German debate on the value of digitized cultures and their relevance for teacher education[1].

Further research should therefore focus on the implementation of Game-Based Learning concepts in higher education systems. It appears necessary to train and engage future teachers in order to enable them to consider using media, such as video games, as a method in pedagogical contexts and to implement such scenarios in primary and secondary schools. It is even more important to make teachers aware of constant changes in the media landscape and to familiarize them with strategies of appropriation. It is also important to evaluate and verify similar education methods within Higher-Education contexts on a larger scale and to consider specific research strategies and methods taking into account the needs of future teachers. This paper might provide an explorative approach to further developments of and research into Game-Based Learning in higher education[2]. [3]

List of abbreviations

PoM - Protection of Minors

USK - *Unterhaltungssoftwareselbstkontrolle* (Entertainment Software Self-Regulation Body)

DGBL - Digital Game-Based Learning

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[1] Aust (2012) and Aust, Bothe & Murata Arendt (2013) summarize the German situation by referencing and discussing results from current research.

[2] For the following semesters, the authors plan to develop an adequate evaluation concept in order to repeat and refine the seminar and its issues and to gather more evaluation data.

[3] We would like to thank our colleagues Dörte Gollek, Friederike Trommler and Sabine Budnick for kindly supporting us with their expertise.

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