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Education, games and apps in Swedish schools

Anita NORLUND¹, Anna DIPACE²

¹ *University of Borås – The Faculty of Librarianship, Information, Education and IT (Sweden)*

² *Department of Humanities, University of Foggia, Foggia (FG)*

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Abstract

This paper is part of a larger research project conducted by a group of researchers belonging to the University of Borås (Sweden) in order to expand the knowledge on how mobile apps are identified, motivated and implemented in Swedish schools. Here, we show results that primarily shed light on features of games and apps chosen by a variety of educational actors. The data production took place in two municipalities of Western Sweden (Borås and Kungsbacka) and were connected to several ongoing municipal projects focusing strengthened inclusion for newly-arrived students and students with a diagnosis of ASD. Research on games and applications in education is limited, both within a Swedish and an international setting. Besides, there are in proportionality more studies on higher education than on compulsory school. Thus, the study of characteristics of games and apps in education in general, and of games and apps both for students with a diagnosis of ASD and newly-arrived students in particular, seems to have been largely overlooked so far. These are grounds for arguing that this study is needed.

Keywords

Games, educational apps, engagement, Swedish schools.

Introduction

According to Mizuko Ito and colleagues: “open educational content, personalized learning systems, game-like learning, massively open online courses, and blended learning offers us important and accessible new tools and techniques to reinvigorate learning” (Ito et al., 2013, p. 41). Furthermore, in 2005, James Paul Gee and colleagues stated that computers were changing our world and the way in which we entertain, communicate and learn. One very useful example they give about new technologies responsible of all these changes is the increasing use of video games not only between children. For the scholars, video games are able to create new social and cultural worlds “that help us learn by integrating thinking, social interaction, and technology, all in service of doing things we care about” (Gee et al., 2005, p. 105). James Paul Gee et al. (2005), do not recommend perceiving games as a panacea, but still they focus their research on the power of using video games as a constructive force in schools, homes, and workplaces. Play can also be considered a natural consequence of development that in turn can then be powered to assess the performance in a more engaging and natural way (Cardoso-Leite et al., 2014).

We know that stakeholders and teachers are aware of the fact that not only games but also apps in general may be useful in teaching and learning. However, Linderoth (2012) argues that good games are not necessarily equal to good learning. There are reasons to believe that this circumstance is valid also for apps when used in education, and thus we argue that more knowledge is needed on games and apps. Our particular focus here are the characteristics of recommended and used games. Given this, the aim is to shed light on features of games and apps chosen by a variety of educational actors.

State of art

In the international scenario, the use of games in formal educational contexts can be considered a well established experience. Several studies (for instance: Prensky, 2001, Kiili, 2005, Pivec, 2007) demonstrate that the design of a school curriculum which includes the use of digital games generates positive effects on learning outcomes. The correlation between digital games and learning is the core of several studies and research carried out during the last few years. In the paper “Video games and the future of learning” (Shaffer et al., 2005), the authors highlight how video games are powerful didactic tools on four levels:

- ethic-epistemological (development of shared values);
- social (development of a set of effective social practices);
- experiential (by testing different identities);
- meaningful (development of the situated learning).

During the last decades, several case studies have been implemented to promote the introduction of digital games into traditional learning environments. A study carried out in 2003, based on surveys implemented by British Education and Technology Agency (BECTA) and by TEEM (Teachers Evaluating Educational Multimedia), described a set of case studies in which digital games were used both in financed research projects and in learning/teaching experience during standard classes (Kirriemuir et al., 2003). Few years later two other case studies were developed in some British schools. The first is *Teaching with games*, promoted by Microsoft, Electronic Arts and Take-Two on the didactic use of digital games at school: The Sims 2, Roller Coaster Tycoon 3, Knights of Honor; the second is *Unlimited Learning*, based on Neverwinter Nights, one of the most popular role games. A more recent and interesting attempt comes from an American project, specifically a district school in New York, called *Quest to Learn*. This project is committed to fostering strong, engaged, literate citizens of a globally networked world, through a pedagogy centred on “learning by doing” that puts students in contexts based on challenge and collaboration. Quest is the first school in the country to arrange its whole curriculum to be “game-like” (Ito et al., 2013).

With significant increasing popularity and number of educational games and game users of different ages, there is a growth of games potential as an original teaching tool. Many studies show that games are attractive and useful to promote learning and engagement through motivation (Singer et al., 2006, Gee et al., 2005, Squire, 2006, Ketelhut, D., 2014).

Together with the use of games to promote learning, quite recently we find the “new” concept of gamification taking place in educational environments in order to promote learning through the concepts of badges, rewards, trophies or medals. These tools make up the visible acknowledgment that the user gets new levels and accomplished challenges (Ketelhut et al., 2011). Gamification has been defined “as the use of game design elements in non-game contexts” (Deterding et al., 2011). Educational badges can be used within an alternative and formative assessment method in order to increase learner motivation and learner engagement. According to Samuel Abramovich and colleagues (2013, p. 217) “badges earning could be driven by learner motivations and that systems with badges could have a positive effect on critical learner motivations”.

Without doubt, digital technology has staked out a place within schools during the recent decades and given rise to great hopes, often expressed in terms of increased student engagement. The affordances of enhanced engagement for compulsory school students’ learning have been emphasised and proven in a multitude of educational research, for instance in connection to games (Abdul Jabbar & Felicia, 2015), to apps (Di Serio, Ibáñez & Kloos 2013), and to apps used particularly in activities with so-called struggling learners (Zhang et al., 2015). Not only increased engagement has been the focus of previous research, but also enhanced learning connected to curricular goals; Vavoula et al (2009) showed the efficiency of a virtual space app for learning about World War II, and Retter, Anderson and Kieran (2013) suggested improved reading and vocabulary skills

from the use of iPads in combination with apps. In turn, Zhang et al. (2015) reported enhanced maths knowledge for at-risk students from their pre- and post-test design including math apps. Parallel to the range of findings which confirm positive effects of apps and games, there have also been more critical ones. Although studies on digital technology appear to have focused *both* on elements of engagement and of curriculum-oriented outcomes, the former type of studies and results are proportionally higher. In other words, it seems to have been more difficult to prove the educational benefits than the motivational ones (see Annetta et al., 2009; Connolly, Stansfield & Hailey, 2011).

In fact, research on games and applications in education is limited, both within a Swedish and an international setting. Besides, there are in proportionality more studies on higher education than on compulsory school (Abdul Jabbar et al., 2015). Thus, studies of characteristics of games and apps in education in general, and of games and apps both for students with a diagnosis of ASD and newly-arrived students in particular, seems to have been largely overlooked so far. These are grounds for arguing that the present study is needed.

Methodology

The data production took place in two municipalities of Western Sweden. The two municipalities are characterised by some demographic differences; they vary in terms of size and proportion of inhabitants with a non-Swedish background, and they are governed by ideologically different municipal executive boards. Both municipalities turned to the research programme *Research and Capability in Inclusion and Welfare (RCIW)* and requested help in ensuring a scientific quality. The programme members in general work with a variety of practice-oriented actors and help to identify potential areas in need of particular attention, make analyses and speed up processes.

The collaborative work produced extensive data and includes remedial action plans, focus group interviews with teacher teams as well as with student health teams, self reports from, and interviews with, study tutors (a mediating profession for newly arrived students), and photo elicitation interviews (see Richard & Lahman, 2014) with students within the two groups of particular interest, i. e. students with a diagnosis of ASD and newly-arrived students. The selection has a special focus on compulsory school (grade 1 to 9, i. e. from the year of six to the year of sixteen). During the process the two researchers involved, noticed that games and apps were often mentioned and, as a consequence, got funding for a pilot project SAPP (an acronym for the Swedish translation of *Games and Apps in Swedish Education*). This second and more determined step involved a new research group constellation and new material was produced with a stronger focus on the phenomena of apps and games. Here, 14 interviews are included; five interviews with teacher teams, five with student health teams including special needs educators, and four interviews with people with key functions, i. e. one

person responsible for digital educational technology at a regional office of a national authority for special needs (the authority is closely connected to the selection of concern, since it is funding one of the municipal projects), one school librarian, and two actors respectively responsible for supplying digital educational technology for newly arrived at municipal level. The first ten interviews had a general focus on a transformation process aiming at increased inclusion for the student groups involved but also followed up issues of games and app use. The guide for the interviews with the key people had a stronger focus on apps and included questions such as the following:

Mention some apps that you have recommended recently:

- For which platform (tablets, smartphones, etc)?
- For which group of students (students with different kinds of diagnoses, newly-arrived students, whole class, individual, grade etc)
- For which purposes?
- Why did you recommend this certain app?
- Do you know in which context the app is being used?

Also, 15 short surveys were distributed and answered by educational staff in connection to the focus group interviews, and at one occasion in connection to a so-called *Pedagogical café*, an open arrangement by the project leader in one of the municipalities involved.

The minor survey included questions such as:

- Name three games or apps that the pupils that you meet have used during the last days at school (not during leisure time).
- Now, choose on of these games or apps that you mentioned:
- Which students (students with different kinds of diagnoses, newly-arrived students, whole class, grade etc) have used this game/this app?
- In which context/-s has this game/app been used?
- What is the motive/are the motives for the use of this game/app?

These are all the questions that were posed to the informants, but for the present study we just use some of them according to the aim explained in the introduction.

Games and apps that were mentioned by name were inserted into an excel book. In order to capture their characteristics and to be able to categorise them, a scheme was developed. The first column in the scheme, i. e., a) what the apps aim at developing according to the producers, was the result of previous re-

search on the connection between pedagogical motives and social justice (see for instance Norlund, 2011). The second and third column, i. e. b) which engagement elements are involved, and c) *if* the app had game characteristics, what subcategory of game could it be referred to (racing, role-playing etc) were based on elements introduced in a systematic review of game-based learning (Abdul Jabbar & Felicia, 2015). Webpages where the chosen apps are presented and promoted by their respective producers were also consulted for aspect a). In total, there are approximately 110 items in the scheme.

For the analyses of *characteristics*, the conceptual pair of *regulative* and *instructional discourse* from Basil Bernstein's pedagogical code theory (Bernstein, 1990, 2000) was also employed. Regulative discourse concerns students' moral values, behaviour, orderliness, character, identity and attitude. It has to do with what students exhibit in the classroom or are encouraged to contribute. Instructional discourse refers to what is usually described as content area matter. The instructional discourse should always be considered to be embedded within the regulative discourse.

The project adhered to the Swedish Research Council's (2011) recommendations on providing sufficient information about the study to the participants, gaining the participants' consent, confidentiality, and to only use data for research purposes. An important part for the student interviews was getting parental consent. In addition, particular attention was paid to what participation entails for those students and educational staff who are included. This meant both acting and processing data so that neither students nor educators were harmed by the research.

Results and discussion

The categorisation scheme helped identifying three areas of interest; *purpose*, *engagement elements* and *games subcategories*.

Referring to what the games and apps aim at developing according to the producers, teachers and key people, the results show that educational actors choose apps and games that primarily have the *purpose* of developing basic skills, mostly mathematics (i.e. *Nomp*), but sometimes even skills of reading and writing (i.e. *Skolstil 2*). Many apps also aim at facilitate translation (i.e. *Say Hi*) and learning foreign languages (i.e. *Duolingo*), or to help student to communicate (i.e. *Moxtra*). Another group of purposes has the ambition to support the students' aesthetic skills (i.e. *Puppet Pals*). Finally, it became evident that the developers and the educational staff strongly focus the amusing aspect of games and apps.

It seems as if the ambition to get students organised is high on the agenda. In parallel, specific content area matters seem seldom to be in focus (cf knowledge of World War II). Using Bernstein's concepts this circumstance could be expressed in the following way:

*the results show that there is little focus on **the content taught** (the instructional discourse) and more focus on **how content should be taught** (the regulative discourse).*

Referring to subcategories of games it can be referred that producers and teachers choose games of several *games subcategories*:

- adventure games (i.e. *Minecraft*)
- racing games (i.e. *Lep's world*)
- role-playing games (i.e. *World of Warcraft*)
- strategy games (i.e. *League of Legends*)

Referring to which *engagement elements* are involved it was revealed that the involved educational staff tend to choose apps and games that have the purpose of giving rewards, collecting stars, moving to different levels, supplying medals and encouraging competition (i.e. *King of Math*). Thus, engagement attributes (rewards) are prominent in the used or recommended apps, just as in previous research.

Conclusions

The aim of this paper was to shed light on features of games and apps chosen by a variety of educational actors. It can be noticed that the games and apps have characteristics that are varied, but there are still issues to consider. For instance, the affordances of learning that games and apps offer do not fully seem to be made use of, referring to the fact that specific content area matters to a great extent is ignored.

As we mentioned in the introduction of the paper, there are four levels fruitful for showing the power of video games in formal educational contexts. For instance, the analysis conducted shows that if the experience is structured by specific goals and if there is social interaction among peers, video games could be tools useful for future problem solving (second and third level: social and experiential). According to James Paul Gee (2008):

Learners need to learn from the interpreted experiences and explanations of other people, including both peers and more expert people. Social interaction, discussion, and sharing with peers, as well as mentoring from others who are more advanced, are important (p. 21).

In order to broaden the understanding in this area it is important to continue this research. Thus, we plan to make an international comparison including two municipalities in the area of southeast Italy and the same for Finland. We also plan to get to know *how* games and apps are actually used in school activities.

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Marina Rui, ricercatrice in Chimica Teorica all'Università di Genova, attualmente è Delegato del Rettore per l'e-learning e per la rete EDUOPEN.

È il presidente in carica di EMEMITALIA (www.ememitalia.org).

È anche membro del Program Committee del Convegno internazionale sull'e-learning (IADIS e-learning) dal 2009. In qualità di chimico fisico, è parte del ECTN (European Chemistry Thematic Network) dal 1997.



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