ATTITUDE TOWARD EDUCATIONAL VIDEO GAMES: THE ROLE OF ENGAGEMENT

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Abstract

Video games account for a vast majority of gamification experiences in education. However, not all video games are equally successful among players, this is, some video games are more engaging than others. This study analyses the relationship of students’ engagement and students’ attitude toward an educational video game designed to learn English vocabulary. The main results suggest that there is a correlation between perceived engagement when playing the educational video game and the attitude toward the educational video game. Perceived engagement also correlates with perceived entertainment when playing the educational video game. Gender differences were also analyzed suggesting that male students were more engaged than female students. Implications for both educators and developers of educational video games are discussed. The main limitations of the study and future research lines are also pointed out.

Keywords: educational video games, gamification, attitude, engagement, gender, entertainment.

1 INTRODUCTION

The literature review provides a wide catalogue of educational video games used to learn languages. Commercially successful gamified mobile apps such as Duolingo or commercial handheld devices video games such as Nintendo Practise English, developed for the Nintendo DS, are well-known examples of video games and game-based learning applied to language learning. Nintendo Practice English contains more than 2000 expressions that are normally used in everyday language. This video game is based on the use of everyday English to improve oral skills with the content focusing on real situations with specific vocabulary, such as meeting someone in a restaurant or a shop. Funland, a web-based teaching resource designed by Cambridge English Language Assessment (Cambridge University), aims for children having fun while learning English within a playful environment using a funfair aesthetic. The increasing use of mobile apps and their ability to meet learners’ needs (“anytime, everywhere”) has fostered a growing market of gamified mobile apps such as the aforementioned Duolingo or Wlingua, an application for learning English available for mobile devices (Android and iPhone), tablets and Windows 8. Wlingua is divided into 4 levels of language competence: A1, A2, B1 and B2 and consists of 600 learning units with vocabulary, grammar and phonetic exercises. It is a resource that is aimed at improving all skills: both oral and written comprehension and production. Moreover, experiences using video games to learn languages do not limit to regular audiences. For example, GraphoGame is a serious game designed to help children with reading difficulties [1]. Using GraphoGame, children first learn basic letters and their sounds and by moving up through a series of levels, they gradually start to learn short words, followed by longer ones.

Along with the increasing number of educational video games used to learn languages, the number of studies exploring the effectiveness of educational video games has also increased. For example, [2], [3], and [4] suggest that video games foster language learning, above all with respect to oral comprehension, acquiring vocabulary, and developing communicative skills. Most of the research on educational video games effectiveness has been focused on English. For instance, [5] found out that the use of video games can be very helpful to practice collocations (common word combinations used in English) in vocabulary learning. However, [6] pointed out that video games also have great potential in the field of learning other languages such as Spanish as a foreign language.

Despite, the increasing number of research studying the effectiveness of educational video games, few research has explored engagement in a game-based context. More surprisingly being engagement “a canonical concept in game-based learning research” (p. 172) [7]. More specifically we aim to fill the following research gap: the relationship between students’ engagement and students’ attitude toward educational video games. Attitude is considered a good predictor of behavioural intention [8]. Therefore, a better knowledge of factors correlating with a person attitude are worth it to be studied. Keeping this
in mind, it is the main goal of this research to explore the relationship of engagement and students’ attitude toward educational video games. The relationship of engagement with students perceived entertainment and the role of gender is also analysed.

This research is organized as follows: first, we review the literature and posit our research questions. Second, we explain the methodology used. Third, we present and discuss the results. Finally, we address the conclusions, limitations of the study, and point out future research opportunities.

2 RESEARCH QUESTIONS

Engagement has been conceptualized in an educational context as a “simultaneous occurrence of elevated concentration, interest, and enjoyment encapsulating the experience of flow” [7]. Previous research clearly suggests that game-based learning can elicit feelings of engagement (e.g. [9], [10]). Previous research has also explored the relationship between engagement and perceived learning [7]. The relationship between engagement and motivation has also been analysed in the literature [11]. However, most of this research has focused on drivers to students’ engagement in their learning process (e.g. motivation) neglecting the potential relation between engagement and students’ attitude toward the learning material (educational video game). In face of the scarcity of research exploring this relationship, we posit the following research question:

RQ1: Is there a correlation between students’ engagement and students’ attitude toward the educational video game?

It is assumed that game-based learning elicits feelings of fun and entertainment. In fact, the entertainment value is a key feature of games in most definitions [12]. It is also assumed that people engage in pleasurable activities like playing. However, few research has provided evidence of the relationship between students’ engagement and students’ perceived entertainment when playing an educational video game. Therefore, we posit our second research question:

RQ2: Is there a correlation between students’ engagement and students’ perceived entertainment?

Finally, the academic literature suggests that gender differences may occur in game-based contexts. For example, previous research found gender differences in attitude towards video games with males showing more positive attitudes towards video games than females [13]. Gender differences also were observed during gameplay in an educational context research [14]. Therefore, we posit our last research question:

RQ3: Are there gender differences in students’ engagement with the educational video game?

3 METHODOLOGY

3.1 Experimental Design

A post-test pre-experimental design was used in this research. In order to increase the ecological validity of the experiment, the experiment took place on a regular classroom in a real English course at a private Spanish University.

3.2 Stimuli

An educational video game to teach English vocabulary was commissioned from a game developer. The video game was designed following the mechanics of a well-known Arcade type entertainment video game (Breakout). The dynamics of the game selected consisted of three mini games within a main game that allowed the player to obtain points and special bonuses as each mini game involving English vocabulary was won. The main goal of the three mini games was to encourage students to practice the vocabulary taught in class. In the first mini game (How do you say…?), a word was presented in Spanish with three possible translations with only one correct option. The aim of this game was that the student selects the correct term in English equivalent to the proposed word in Spanish. In the second mini game (Pairs), a list of short expressions in English was given with their translation in Spanish. The goal of this game was for the student to successfully pair up each English expression with the corresponding Spanish one. The third of the mini games (Translate the Sentence), encouraged the student to put together a sentence using words from the vocabulary given in class. A snapshot of the Translate the Sentence mini game is depicted in Annex I.
3.3 Procedure
The experiment started with a lecture of 30 minutes regarding the topic of the day in a real English course at a private Spanish University. After this lecture, the students played the educational video game for about 30 minutes as an innovative way to practice the vocabulary taught. Afterwards, the students took a vocabulary test (not related to this paper) and completed a pen and pencil self-administrated questionnaire. All students used the same computer equipment in a computer laboratory and played the game individually using headphones provided by the University.

3.4 Measurement instrument
An ad-hoc self-administrated questionnaire was developed for this research. All items were adapted from existing scales and were measured using a 5-point Likert-type scale (1 = strongly disagree, and 5 = strongly agree) except gender which was measured as a dichotomous variable (male/female). Twelve items were adapted from [15] to measure Engagement. Four items were adapted from [16] to measure perceived entertainment.

3.5 Sample
A convenience sample of 103 students from a private Spanish University was used in this research. The average age was 21 years, and 48.5% were female.

4 RESULTS
In general terms data suggests that individuals were not strongly engaged neither entertained by the video game as both scales, although having a positive evaluation, score, in general, slightly less than 4 out of 5 (3.71 and 3.81 respectively). However, students had a positive attitude towards the educational video game, as this scale has a more positive evaluation (4.08).

In order to analyse the relationship between students’ engagement and students’ attitude toward the educational video game, a Pearson correlation coefficient was considered (see Table 1). The analysis was performed just considering the individual’s average of each scale. The analysis suggests that there is a strong positive correlation between both variables: the higher the perceived engagement when playing the educational video game the better the attitude toward it.

The same conclusion can be reach when talking about perceived entertainment (Table 1). Both variables are positively and strongly correlated: the higher the perceived engagement with the video game, the higher the perception of being entertained by the video game.

<table>
<thead>
<tr>
<th>Table 1. Results of Person’s correlation coefficient analysis.</th>
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<tbody>
<tr>
<td>Perceived engagement of the educational video game</td>
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<tr>
<td>p = .716 (sig. &lt; .000)</td>
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</table>

Gender differences regarding the three variables were analyzed using a series of t test analyses. Again, just the individual’s average score of the scales were used (and not each specific item). Results are shown in Table 2. As we can see, there are not significant differences between male and female students regarding attitude or entertainment when playing the educational video game. However, significant differences appear when considering engagement, resulting in male students being more engaged to the video game than female students.

<table>
<thead>
<tr>
<th>Table 2. Differences between males and females (mean values).</th>
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<tbody>
<tr>
<td>Perceived engagement of the educational video game</td>
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<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>t = 2.49 (sig. &lt; .05)</td>
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</table>
5 CONCLUSIONS, LIMITATIONS, AND FUTURE RESEARCH

This study’s main goal was to explore the relationship between students’ engagement, students’ perceived entertainment, and students’ attitude toward an educational video game developed to learn English vocabulary. As suggested by our results, both variables (attitude and perceived entertainment) highly and positively correlate with students’ engagement. That is, the higher the students’ engagement with the educational video game the better their attitude toward it and the higher the entertainment experienced by students. Because, as previously seen in the literature review, having a positive attitude toward an educational video game is a desirable outcome of playing an educational video [8], both game developers and teachers using educational video games in their courses should have in mind the capacity of the educational video game to engage students. In fact, students of this sample were not strongly engaged to the educational video game they played. As also seen in the literature review, engagement is driven by multiple factors (e.g. [11]). Therefore, future research should explore factors influencing engagement based on sample characteristics. For example, different video genres might appeal (and entertain) differently to men or women. In fact, our results suggest that men students were more engaged with the educational video game than female students. Along with attitude, perceived entertainment is also a factor that might influence future students’ evaluations and future behaviour regarding the educational video game. Therefore, both game developers and teachers should check the “entertainment value” of an educational video game before using it in a course.

One limitation of this study is that only a video game genre (an arcade breakout-type game) was used. Future research should replicate this study using a different video game genre to explore differences or similarities in the results based on video game genre. Another limitation of this study is the convenience sample used which prevents to generalize the results of the study. Future research should use probabilistic samples in order to increase the external validity of the results.

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REFERENCES


ANNEX I. MINI GAME TRANSLATE THE SENTENCE.

![Image of a mini game with the text: Hay demasiada grasa en los fritos]