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Teachers' Attitude towards and Actual Use of Gamification

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Abstract

Gamification represents an innovative and engaging methodology to motivate students and enhance their learning process. Nevertheless despite an increasing academic interest in gamification over the last years, teachers' attitude towards gamification and actual use of gamification remains a neglected research area. This exploratory study aims to gain a better knowledge of teachers' serving in higher education institutions attitude towards gamification. Actual use of gamification is also explored. Main findings suggest only a small percentage of teachers (11.30%) use gamification on a regular basis in their courses although teachers' attitude towards gamification is positive and high. Results show no differences in use of gamification by age, gender or type of institution (public or private). Nevertheless there is a significant more positive attitude towards gamification for teachers serving in private universities than in public universities. Results revealed no age dissimilarities in use or attitude towards gamification. Results also suggest an attitude-use gap.

1. Introduction

The use of games or games elements in education is not new and can be traced back to the sixties when Piaget (1962) pointed out that games could not only help children to master their environments but also to create the worlds of their imagination. Games also encourage students to play an active role in the learning process thus supporting

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active learning, experiential learning, and problem-based learning (Oblinger, 2004). Previous research has detected that the use of games or games elements in the classroom can also enhance the classroom atmosphere (Yang, 2012). Moreover the use of video games in the classroom may be appealing and motivating for the new generations of students that have grown up in the age of video games (Glover, 2013). Other reasons supporting gamification include the facilitation of scaffolded instruction based on each individual student's needs (Hanus & Fox, 2015); the immediate and frequent feedback that games provide (Kapp, 2012); the capacity to give students the freedom to fail without fear when learning (Lee & Hamer, 2011); and a trial-and-error learning process which makes mistakes recoverable (Hanus & Fox, 2015). Despite all the promising outcomes that might be expected from gamification, teachers play a key role to implement new practices and methods in their courses and literature review clearly suggest that several factors can prevent teachers to introduce pedagogical innovations –and especially technology-related innovations– in the classroom (Mumtaz, 2000). Attitude towards a target behavior (e.g. using gamification) is one of such key factors because attitude is an important predictor of an individual's intention toward performing the target behavior (Fishbein & Ajzen, 1975). Very little is known about teachers' attitudes and actual use of gamification. To fill this research gap this study main goal is to analyze: i) teachers' attitude towards gamification, and ii) teachers' actual use of gamification. The role of gender, age, and institution type (public vs private) is also analyzed. This paper structures as follows: firstly, we review literature on gamification and posit our research questions. Secondly, method and results are exposed. Finally, we address discussion, conclusions, limitations of the study and future research lines.

2. Gamification

Su and Cheng (2015) define gamification as "The use of game design elements and game mechanics in non-game contexts in order to engage people and solve problems" (p. 269). Literature review suggest an increasing interest in the use of gamification in education as a means to improve students' engagement and learning outcomes (Clark et al., 2011). It has been stated that the elements that make games fun –along with the nature of games themselves– are intrinsically motivating (McGonigal, 2011). Therefore applying game mechanics to the classroom may increase students' intrinsic motivation to learn (Hanus & Fox, 2015). Games also offer a visual display of progress –e.g. badges– (Kapp, 2012) and give students the freedom to fail without fear when learning (Lee & Hamer, 2011). Literature review also reveals that the use of games or games elements in education has been applied across all levels of education from primary schools (Su and Cheng (2015), to secondary education (Giannakos, 2013), and higher education (Dib & Adamo-Villani, 2014). Gamification has been used to teach a wide variety of subjects that range from energy education (Yang, Chien, & Liu, 2012) to veterinary education (De Bie & Lipman, 2012), citizenship education (Lim & Ong, 2012) or even nanotechnology (Blonder & Sakhnini, 2012). Despite an increasing research on gamification one key driver on gamification implementation in the classroom, the teacher, remains nearly neglected in gamification research with few research focused on them (Pivec & Pivec, 2011).

3. Research questions

Teachers play a key role in introducing pedagogical innovations in the classroom, especially technology-related innovations (Ketelhut & Schifter, 2011; Mumtaz, 2000), so teachers will play a key role in adopting the use of gamification in their courses based on their attitude towards gamification. In order to better understand teachers' actual use of gamification we first address teachers' attitude towards gamification as attitude is an important predictor of an individual's behavior. Teachers' actual use of gamification is then addressed. The role of gender, age, and type of institution teachers are serving (public or private) is also analyzed.

3.1. Attitude towards gamification

Attitude refers to an individual's degree of evaluative affect toward a target behavior (Fishbein & Ajzen, 1975). Therefore attitude is an important predictor of an individual's intention toward performing the target behavior. Attitude towards gamification can be conceptualized as the evaluative affect to use gamification as a teaching

methodology. We posit the following research question in order to gain a better knowledge of teachers' attitude towards gamification:

RQ1: Do teachers serving in higher education institutions show a positive attitude towards gamification?

3.2. Actual use of gamification

Actual use of gamification can provide useful insights on the role that gamification plays as a teaching methodology in today's higher education. In order to gain a better knowledge of teachers' actual use of gamification in higher education institutions we posit the following research question:

RQ2: Are teachers serving in higher education institutions using gamification in their courses?

3.3. Gender

Gender has been found to play an important moderating role in video game contexts. Although gender differences seems to diminish among younger generations (ESA, 2015) boys usually have more positive attitudes towards video gaming than girls (Bonanno & Kommers, 2008). Gender differences have also been observed during gameplay in an educational context (Bressler & Bodzin, 2013). Therefore we posit the following research questions:

RQ3a: Does gender affect attitude towards gamification for teachers serving in higher education institutions?
RQ3b: Does gender affect actual use of gamification for teachers serving in higher education institutions?

3.4. Age

Age has been found to be a key variable in education as older teachers are supposed to be more experienced than younger ones. Nevertheless previous research suggest that age can negatively affect the use of Information and Communication Technologies (ICT) by older teachers. Goodwyn et al (1997) found that for older teachers ICT is generally a threat and the cause of much anxiety. As gamification is a pedagogical innovation usually associated to technology (e.g. video games) we believe that age might infuence teachers' attitude and actual use of gamification. Therefore the following research questions are posit:

RQ4a: Does age affect attitude towards gamification for teachers serving in higher education institutions?
RQ4b: Does age affect actual use of gamification for teachers serving in higher education institutions?

3.5. Type of institution

Public and private higher education institutions differ in business models, costs, and management. Because gamification might imply additional costs (e.g. teachers training courses, new learning materials), along with different implementation policies, or even different teachers profile we address the role of type of institution (public vs private) on teachers' attitude and actual use of gamification positing the following research questions:

RQ5a: Does type of institution affect attitude towards gamification for teachers serving in higher education institutions?
RQ5b: Does type of institution affect actual use of gamification for teachers serving in higher education institutions?

4. Method

Snowball sampling was used for selection of participants (Goodman, 1961; Biernacki & Waldorf, 1981). Although snowball sampling is unlikely to obtain a representative sample because there is no real control of the snowball effect this form of sampling is often used when it is impossible to identify beforehand all those who might fall into the project's category of interest (Hall & Hall 1996; Winkler & Buckner 2006). Authors forwarded the link to an online survey to colleagues serving in higher education institutions encouraging them both to take the online survey and to forward the link to other colleagues.

4.1. Sample

A final sample of 98 teachers serving in higher education institutions completed the survey. The average age of respondents is 43.87 years old and 56.25% of them are male. Table 1 summarizes demographic data of the sample.

Table 1. Demographic data of the sample.

		Percentage	Means
Gender	Male	56.25	--
	Female	43.75	--
Age		--	43.87
Type of university	Public	56.10	
	Private	43.90	

N=98

4.2. Measures

Three items were adapted from Davis et al (1989) to measure attitude toward gamification (e.g. "My attitude towards gamification/educational games is positive"). Actual use was measured using time periods that range from "never" to "more than 3 years". Gender and institution type were measured as dichotomous variables (male/female, and public/private).

5. Results

RQ1 addressed teachers' attitude towards gamification. Results show that teachers find gamification/educational games a good idea (Mean=4.42/5) and a positive thing (Mean=4.35/5). In addition teachers have a favorable attitude towards gamification (Mean=4.28/5) (see Table 2). RQ2 addressed teachers' actual use of gamification. Results show that 38.10% of the respondents have never used gamification in their courses. Among the remaining 61.90% that have used gamification in their courses, 11.30% use gamification on a regular basis (see Table 3).

Table 2. Teachers' attitude towards gamification

	Mean	Std. Deviation
I find gamification/educational games a good idea (ATG 1)	4.42	0.807
My attitude towards gamification/educational games is positive (ATG 2)	4.35	0.808
My attitude towards gamification/educational games is favorable (ATG 3)	4.28	0.861

N=98

Table 3. Use of gamification or educational games by respondents

	Frequency	Percentage
No, never	61	38.10
Sometimes	81	50.60
Yes, always	18	11.30

N=98

A t-test was conducted in order to find differences in attitude towards gamification between gender, age and type of university. RQ3a and RQ3b explored gender effects in both attitude towards gamification and actual use of gamification. Table 4 shows no differences in teachers' attitude towards gamification/educational games by gender. In the same sense, results did not reveal significant differences regarding teachers' use of gamification/educational games by gender (see Table 5).

Table 4. Teachers' attitude towards gamification by gender

	T-test	Sig.	Male		Female	
			Mean	Std. Deviation	Mean	Std. Deviation
ATG 1	-0.862	0.391	4.31	0.962	4.45	0.647
ATG 2	-0.988	0.326	4.22	1.006	4.39	0.571
ATG 3	-0.603	0.548	4.22	1.006	4.33	0.625

N=98

Table 5. Use of gamification or educational games by gender

General		Male		Female	
Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
1.73	0.651	1.65	0.597	1.82	0.635

N=98   T-test   -0.603   Sig.   0.548

RQ4a and RQ4b addressed the effects of age in both attitude towards gamification and actual use of gamification. Results did not reveal any correlation between age and teachers' attitude towards gamification. In the same way, no correlations were found between age and actual use of gamification (see Table 6 and Table 7).

Table 6. Teachers' attitude towards gamification by age

	ATG 1	ATG 2	ATG 3
Correlation Coefficient	0.063	0.032	0.042
Sig. (1-tailed)	0.217	0.344	0.298
N	98	98	98

Table 7. Teachers' use of gamification by age

Correlation Coefficient	0.059
Sig. (1-tailed)	0.236
N	98

Finally, RQ5a and RQ5b main goal was to analyse if the type of institution where teachers are serving affects both attitude towards gamification and actual use of gamification. Results suggest a more positive attitude towards gamification in private universities than in public universities. There is a significant better attitude in private universities regarding the ATG2 variable ('My attitude towards gamification/educational games is positive'). Although the weight of teachers from private universities in our sample is high, a more positive attitude towards gamification is suggested for this type of institution. Results show no differences in use of gamification or educational games by type of institution.

Table 8. Teachers' attitude towards gamification by type of institution

	T-test	Sig.	Public		Private	
			Mean	Std. Deviation	Mean	Std. Deviation
ATG 1	-1.441	0.153	4.27	0.849	4.51	0.768
ATG 2	-1.720	0.089*	4.18	0.884	4.47	0.702
ATG 3	-1.511	0.134	4.16	0.877	4.42	0.763

N=98

Table 9. Use of gamification/educational games by type of institution

	General		Public		Private	
	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
	1.73	0.651	1.67	0.640	1.81	0.588
N=98	T-test	-1.123	Sig.	0.264		

6. Discussion

Gamification seems to remain a trending methodology used by just a small percentage of teachers on a regular basis in their courses (11.30%). Nevertheless our results suggest that teachers' attitude towards gamification is positive. An attitude-use gap seems to be happening and this gap is not affected by gender, age, and type of institution. Our results suggest that only attitude is affected by type of institution so other factors than gender, age, and type of institution are affecting this attitude-use gap. Previous research found that main barriers preventing teachers to use pedagogical innovations –especially technology-related innovations– are lack of time, lack of training, and lack of economic support (see a review in: Mumtaz, 2000) so more research is needed in order to answer the attitude-use gap found in this research.

7. Conclusions, limitations, and future research

Gamification represents an innovative and engaging methodology to motivate students and enhance their learning process. Through this exploratory study we shed light on teachers' attitude towards gamification and actual use of gamification in higher education. One main conclusion of this research is that it might be an attitude-use gap in gamification: while teachers show a positive attitude towards gamification there is not an intense use it their courses. Nevertheless the exploratory design of this research does not allow for generalization so future research should use other type of design and sample in order to confirm these findings. One main limitation is the convenience sample used in this study. Because snow ball sampling does not allow to control the sample the average age of respondents is high (43.87). Future research should control this variable to get a wider age range to make results more representative of the target population. As gender and age did not probe affecting both teachers' attitude towards gamification and teachers' use of gamification future research should also explore other drivers and barriers than demographics in gamification adoption (e.g. lack of training, lack of time to prepare gamified classes). Future research should also explore differences on attitude towards gamification between current users vs. non-users.

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