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"Evaluating new technologies and education gamification in higher education: the case of Kahoot!"

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Abstract

The profile of students in higher education is changing and yet, in spite of this, traditional methodologies of teaching are used without considering either the changes or the available resources. Over the last few decades, the presence of technology in society has transformed many sectors and higher education should take the new opportunities offered to them.

The goal of this pilot study is to introduce learning resources based on new technologies and education gamification by the implementation of Kahoot! in higher education. This methodology has been used with 53 students of the Degree in Social Work who are studying the subject "Research in Social Welfare Systems".

An ad-hoc questionnaire made up of 22 questions was conducted, evaluating the seven principles of good feedback practices. Each item was accompanied by a Likert scale to reflect the student's degree of compliance with each statement.

The results have shown that Kahoot! was regarded both as a fun way to learn by 88.7% of the students and a good way to identify the main contents of the subject by 86.8% of them. However, 43.4% of students did not see Kahoot! as a tool to learn new content and 49.1% thought that the learning outcomes obtained during the experience did not reflect their progress in the subject.

The use of Kahoot! has shown some advantages and disadvantages. On the one hand, Kahoot! was regarded as a good way to review the content of the subject in a fun and interactive manner but, on the other hand, the students thought that it was not the best tool to learn new contents and to show their

knowledge about the subject. The results have shown the limitations and opportunities that Kahoot! can offer in higher education.

Keywords: *Kahoot!, gamification, higher education, social work, evaluation*

1. Introduction

One of the most significant characteristics of our society is the inclusion of new information and communication technologies in several fields such us culture, leisure, work, economy and science. Hence, during the last few decades, the presence of technology in society has transformed many sectors including education. There is no doubt that technology's presence is having an impact on the education sector in general and in particular on teaching methods and the learning process of the students (Aguadez, Pérez and Monescillo, 2010). New information and communication technologies in the education field can help to improve the learning results of students and can motivate them. Despite these advantages, traditional methodologies of teaching are more frequently used without considering either the available resources or the changes in the students' profile. However, the university population is already very highly exposed to new technologies and electronic devices such as tablets, smartphones or laptops. Therefore for this group, technology is already part of their day to day life and it is important that the educational community begins to adapt education to the environment of the students taking advantage of those elements that stimulate them (Fernández and Ladrón de Guevara, 2015).

As a consequence, the goal of this pilot study is to assess the impact of learning resources based on new technologies and education gamification such as Kahoot! on the students' learning process by using the seven principles of good feedback practice (Omar, 2017). To this end, Kahoot! was used in the subject of Research in Social Welfare Systems belonging to the Social Work degree at the University of Valencia.

1.1. Gamification in the learning process

The game is an activity as old as humanity, having great importance in all cultures, contributing to the enjoyment life, the enrichment of social relationships and the learning processes (Sánchez, 2010). In this sense, it can be said that the game has an educational potential that can be used at all educational levels.

The applicability of the games in the classroom has given rise to the appearance of new theoretical concepts such as "gamification" as the result of making use of game theory used in contexts that do not have anything to do with games in order to make more interesting an ordinary activity. The ultimate aim of gamification in the education field is to achieve an effective learning process (Jaber et al., 2016; Fernández and Ladrón de Guevara, 2015). However, not every learning process lends itself to be gamified. According to Díaz and Lizárraga (2013) there are three important elements in an activity for it to be considered as a game. Firstly there is the competition, which motivates the players and allows them to assess their performance immediately. Secondly, the engament to not to abandon the game and keep playing until the goals are reached since the motivation of students to learn is a key point. Finally, games should have instant reward.

Among the gamification tools, Kahoot! stands out since it introduces the game in class improving the learning process of the students by using new techonologies such as smartphones.

1.2. Kahoot! and the students' good feedback practice

Kahoot! is a platform in which it is possible to create several questions and answers according to the profile of, for example, different students. Students can answer the questions in class by using their smartphones. It has two modalities (individual or team) and is an easy-to-use tool that permits interaction between students and teachers. Finally, Kahoot! provides the teacher with relevant information about the students' performance, segregated by each student or team in an excel document.

Some studies have tried to evaluate the suitability of this tool for learning-teaching in the classrooms and at different levels of education such as primary, secondary and higher education. In this regard, several advantages and disadvantages have been attributed to the use of Kahoot! for learning and teaching purposes. For example, some studies have revealed that Kahoot! was a tool which had some features such as encouraging problem solving, critical thinking and curiosity and it promoted a competitive and fun environment, improving students 'motivation and self-esteem as well as achieving greater knowledge (Omar, 2017; Dellos, 2015). Similarly, Suilowati (2017) corroborated that after using Kahoot! in their grammar classes, 99% of the students liked the game, obtaining mostly good results (20 students out of 32).

This kind of tool makes that the students regard it as game instead of an evaluation system (Del Cerro, 2015; Fernández-Mesa, Olmos-Peñuela and Alegre, 2016) and it promotes an active learning process involving the students in class (Jaber et al., 2016). In addition to this, Kahoot! has been considered to be a useful tool for teachers, as it can help to improve

lecturers' teaching, and students are very impressed by lecturers using technology in class (Omar, 2017).

However, Kahoot! is not without limitations. This tool requires time to to prepare the questions and surveys (Rodríguez-Fernández, 2017). Considering its features, Kahhot! has been regarded as a good way to review what they have learnt but without provindg any extension of new knowledge. According to the results obtained by Omar (2017) students also highlighted as the main drawbacks of Kahoot! its ranking, as a vague measure of the students' performance, and the fast pace of tests in Kahoot! not permitting a discussion about the answers. Beyond these findings, other studies have even noted that students do not consider Kahoot! a proper tool to be used in higher education (Rodríguez- Fernández, 2017).

Given the advantages and disadvantages associated with Kahoot!, this work tries to take a step futher by evaluating its impact on the student learning process in higher education. To this end, this research has taken as main assessment framework the seven principles of good feedback practices Omar (2017). In particular, this methodology has been used with 53 students of the Social Work degree course at the University of Valencia in the subject "Research in Social Welfare Systems".

2. Method

In this research an ad-hoc questionnaire made up of 22 questions was conducted, evaluating the seven principles of good feedback practices. Each item was accompanied by a Likert scale from 1 to 4 to reflect the student's degree of compliance with each statement. In this scale 1 indicates the highest degree of disagreement and 4 implies the highest degree of compliance with each of the statements.

In particular, each principle was evaluated through the following items and statements:

Table 2.1. The seven principles of good feedback practices.

Number	Principle	Items
Principle 1	Helps to clarify what a good performance is	Item 10: The Kahoot! ranking is a good indicator of the performance of the student in subject
Principle 2	Facilitates the reflection and self-assessment in the learning process of students	Item 4: Kahoot! has helped me to identify the contents that I should review for the exam
		Item 5: Kahoot! can help me to be better prepared for the exam
		Item 7: Kahoot! has helped me to identify my level of knowledge
		Item 8: Kahoot! has helped me to compare my level of knowledge to the level of my classmates
Principle 3	Provides relevant information to students about their learning process	Item 1: Kahoot! is a suitable tool to review the content explained in class
		Item 3: Kahoot! has helped me to learn new contents
Principle 4	Encourages teacher and peer dialogue around learning	Item 13: The speed of Kahoot! has allowed me to discuss the correct answer with other classmates
		Item 14: The speed of Kahoot! has allowed me to discuss the correct answer with the teacher
Principle 5	Encourages positive motivational beliefs and self-esteem	Item 9: Comparing my results to those obtained by my classmates has been useful to motivate me
Principle 6	Provides opportunities to close the gap between the current and the desired performance of the students	Item 2: Kahoot! It has been useful to identify the most important contents
		Item 11: Knowing my position in the Kahoot! ranking has helped me judge whether my progress in the subject is appropriate
		Item 12: My position in the Kahoot! ranking will help me improve my position in the next one
Principle 7	Provides information to teachers that can be used to help shape the teaching	Item 15: I think that teachers should use more tools based on new technologies in class
		Item 16: I prefer teachers who use interactive tools based on new technologies in class to those

		who use more traditional teaching methods
		Item 17: I think the use of Kahoot! can provide teachers an appropriate feedback on student learning
		Item 18: I think that Kahoot! is a fun way to learn

Font: Own elaboration based on Omar, N (2017)

Each item evaluating the aforementioned principles was designed based on the results from the qualitative research work developed by Omar (2017).

Moreover, the questionnaire included 5 items evaluating some common features attributed to Kahoot! and one item to assess its adaptation to higher education:

Table 2.2. Items related to features attributed to Kahoot!.

Other Features
After using Kahoot! I have achieved greater knowledge of the subject
Kahoot! encourages problem solving and critical thinking
Kahoot! encourages curiosity
Kahoot! promotes a competitive and fun environment
I think Kahoot! is suitable for use in higher education

Font: Own elaboration

The questionnaire was administrated after a Kahoot! session in two different groups. The Kahoot ! session vas held in April 2018, using student's smartphones. The sample was made up of 53 students from two groups belonging to the subject "Research in Social Welfare Systems" (32 students from the first group and 21 from the second group). This subject is taught in the 3rd course of the Degree in Social Work at the University of Valencia.

By gender, 90.6% were women and 3.8% men (the rest did not indicate their gender 5.7%). Considering the age, 83% were students up to 26 years old. The remaining students were over 26 years old.

3. Results

In this section the results are shown according to the seven principles of good feedback practices and the most highlighted features of Kahoot!. The results obtained are presented in Table 3.1. and Table 3.2.

Table 3.1. Results related to the seven principles of good feedback practices.

Principle	Items	Results							
		1	2	Disagreed	3	4	Agreed	NA	Total
1	Item 10	18.9%	26.4%	45.3%	35.8%	18.9%	54.7%	0%	100%
2	Item 4	1.9%	7.5%	9.4%	35.8%	54.7%	90.5%	0%	100%
	Item 5	1.9%	13.2%	15.1%	35.8%	49.1%	84.9%	0%	100%
	Item 7	5.7%	18.9%	24.5%	28.3%	45.3%	73.6%	1.9%	100%
	Item 8	9.4%	30.2%	39.6%	26.4%	34.0%	60.4%	0%	100%
3	Item 1	3.8%	5.7%	9.4%	30.2%	58.5%	88.7%	1.9%	100%
	Item 3	0%	43.4%	43.4%	41.5%	15.1%	56.6%	0%	100%
4	Item 13	20.8%	17.0%	37.7%	34.0%	28.3%	62.3%	0%	100%
	Item 14	22.6%	20.8%	43.4%	32.1%	24.5%	56.6%	0%	100%
5	Item 9	15.1%	34.0%	49.1%	35.8%	15.1%	50.9%	0%	100%
6	Item 2:	0%	13.2%	13.2%	34.0%	52.8%	86.8%	0%	100%
	Item 11	9.4%	39.6%	49.0%	34.0%	17.0%	51.0%	0%	100%
	Item 12	3.8%	22.6%	26.4%	54.7%	18.9%	73.6%	0%	100%
7	Item 15	0%	9.4%	9.4%	30.2%	60.4%	90,6%	0%	100%
	Item 16	1.9%	11.3%	13.2%	35.8%	51.0%	86.8%	0%	100%
	Item 17	1.9%	17.0%	18.9%	43.4%	37.7%	81.1%	0%	100%
	Item 18	3.8%	7.5%	11.3%	30.2%	58.5%	88.7%	0%	100%

According to the results, Kahoot! meets the the seven principles of good feedback practices. However, the following principles obtained the lowest score:

- Principle 1: Helps clarify what good performance is (goals, criteria, expected standards)
- Principle 4: Encourages teacher and peer dialogue around learning
- Principle 5: Encourages positive motivational beliefs and self-esteem

As for the specific features of Kahoot!, the items greater variability among the students opinions were the idea that the students had a greater knowledge of the subject after using Kahoot! and the statement that Kahoot! encourages problem solving and critical thinking. However, the great majority of students agreed that Kahoot! promotes a competitive and fun environment and it is suitable for use in higher education.

Table 3.2. Results related to the specific features of Kahoot!.

Other features	Results							
	1	2	Disagreed	3	4	Agreed	NA	Total
After using Kahoot! I have achieved greater knowledge of the subject	5.7%	24.5%	30.2%	58.5%	9.4%	67.9	1.9%	100%
Kahoot! encourages problem solving and critical thinking	5.7%	30.2%	35.8%	45.3%	18.9%	64.2%	0%	100%
Kahoot! encourages curiosity	3.8%	18.9%	22.6%	50.9%	26.4%	77.3%	0%	100%
Kahoot! promotes a competitive and fun environment	1.9%	15.1%	17.0%	43.4%	39.6%	83.0%	0%	100%
I think the Kahoot! is suitable for use in higher education	1.9%	11.3%	13.2%	45.3%	41.5%	86.8%	0%	100%

4. Conclusions

The goal of this pilot study has been to introduce learning resources based on new technologies and education gamification by the implementation of Kahoot! in higher education. In particular, the tool of Kahoot! has been assessed taking as a main framework the seven principles of good feedback practices. To this end, an ad-hoc questionnaire was administrated after the use of Kahoot! to 53 students in the subject of Research in Social Welfare Systems belonging to the Degree in Social Work at the University of Valencia.

The results have shown that the use of Kahoot! has some advantages and disadvantages through the seven principles of good feedback practices assessment framework. Generally speaking, Kahoot! met the seven principles. Nevertheless, principle 1 "helps clarify what good performance is", principle 4 "encourages teacher and peer dialogue around learning" and principle 5 "encourages positive motivational beliefs and self-esteem" obtained the lowest score.

Hence, Kahoot! was regarded as a good way to review the content of the subject in a fun and interactive manner similarly to other studies (Del Cerro, 2015; Fernandez, Olmos and Alegre, 2016). However, the students thought that it was not the best tool to learn new contents and to show their knowledge about the subject contradicting the results of Dellos (2015). Therefore, similarly to the study of Omar (2007), it seems that Kahoot! is a tool more suitable for reviwing content learnt in a fun way intead of provindg new knowledge. In addition, according to the results obtained, a greater proportion of students did not totally agree with the statement that the ranking of Kahoot! was not a good indicator of their performance in the line with Omar (2007).

It has also been attributed to Kahoot! the power to motive students by getting good results (Omar, 2017; Suilowati, 2017; Dellos, 2015). In spite of this, in this study the competence introduced by Kahoot! has not been regarded as positive as other items. This fact is of the utmost importance since it might be an factor affecting the acceptance of this tool in higher education.

Therefore lecturers who consider using or are already using Kahoot! may wish to take into account that motivation might not be an intrinsic element of Kahoot! and that they may still need to provide their own forms of encouragement.

Similarly, one of the lowest rated items were those related to the speed of Kahoot! reinforcing the finding obtained by Omar (2017). This element is an important issue as it might have an importat impact on the students' learning process if enough time to discuss questions with peers and answers with the teacher is not provided.

Although students value in a positive way teachers who use interactive tools based on new technologies such as Kahoot! (Omar, 2017) and thought that Kahoot! is suitable for higher education, special attention should be paid to some elements by teachers when using Kahoot! such as those related to the Kahoot!'s settings, students's motivation and goal to achieve.

Be that as it may, the results of this work have shown the limitations and opportunities that Kahoot! can offer to higher education.

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