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GAME-BASED LEARNING IN HIGHER EDUCATION: A COMPARATIVE STUDY IN TOURISM DEGREES

Sónia Pais[1], Laura Chagas[1, 2], & Ana Pires[1]
[1]CiTUR – Centre for Tourism Research, Development and Innovation, Polytechnic Institute of Leiria (Portugal)
[2]CI&DEI (Portugal)

Abstract

New strategies regarding student-centered approaches have emerged in higher education contexts, in order to promote student motivation and engagement towards the learning process. Online quiz platforms such as Kahoot! seem to contribute to the consolidation of learning, particularly through content review.
A quantitative survey was conducted among 86 students from a higher education institution offering undergraduate degrees in the area of Tourism, specifically within the subjects of English and Statistical Analysis. Following a consistent application of Kahoot! quizzes in class for reviewing purposes, the survey was implemented in order to allow for an examination of how the students perceived the usage of this game-based learning tool.
Results show that most students consider the use of Kahoot! in classes to make learning more challenging and dynamic, while positively contributing to content consolidation.. However, the results obtained evidence that further studies are needed to confirm the effect on the use of Kahoot! in student performance.

Keywords: *Higher education, web tools, educational games, motivation.*

1. Introduction

In the last few decades, higher education has been faced with a number of substantial changes, which have impacted both students and faculty. On the one hand, the number of students accessing higher education has grown exponentially and, as a consequence, the student-teacher ratio has changed and the student body has become more and more heterogeneous (Olssen and Peters, 2015). This democratization of higher education brought with it many social and economic benefits but aggravated already existing challenges across all education levels regarding student commitment, compromise and motivation (Kember et al., 2021). Another recent major transformation in higher education came as a result of the widespread use of information and communication technologies (ICTs), supported by the advent of the Internet. Technology was adopted in higher education not only at institutional level, through the offer of blended learning or online learning, but also as a means to innovate teaching methods in face-to-face classes (Dečman, 2015). The use of technology in face-to-face classes led to a process of reform and innovation, as it allows the development of student-centered activities that involve cooperation and active participation, thus altering the traditional role of faculty and students (Wang et al., 2009; Guardia et al., 2019). Considering that higher education students are mostly digital natives, known for their dependency on information technology and lower attention span, the adoption of game-based learning platforms can help improve students' learning experiences in higher education (McCoy, 2010; Lister, 2015).

This article includes a reflection on how the use of a specific game-based learning platform, Kahoot!, can improve the learning experiences of students in higher education, especially students in the field of Tourism. Within the subjects of Statistical Analysis and English, the researchers resorted to Kahoot!, accessed by students through their mobile devices, in order to revise contents throughout the semester and to encourage and increase their participation and motivation during classes.

In the case of Mathematics, technology has become essential because the teaching and learning processes are enriched with the use of technologies improving the students' motivation and the students' learning process (Bullon et al, 2018; Zabala-Vargas et al., 2019). ICTs are tools that innovate the way mathematics is taught and they may facilitate students' learning (Scanlon et al., 2005).

As far as English language learning is concerned, game-based learning can help to cultivate positive attitudes and increase motivation level of participants, while allowing for language practice, namely easiness of grammar or lexical revision and better acquisition of new structures (Michos, 2017).

2. Methodology

The aim of this study is to understand how Tourism students perceive the use of Kahoot! in higher education, more specifically within the context of Mathematics and English classes, with three groups of students. Although the specific name of the subject is Statistical Analysis, the contents refer to the general area of Mathematics, so henceforth we mention this particular field in a theoretical perspective and the subject name in the context of the study.

In this case study, the authors used a game-based learning platform in class, namely Kahoot!, which students could access through their mobile devices, with the intention of encouraging them and promoting their participation and motivation. The platform was used in three lecture classes that corresponded to the conclusion of a syllabus topic. Kahoot! quizzes were therefore mainly used for reviewing class content.

A satisfaction survey was used to gather information about Tourism students' perceptions and quantitative data were collected. A few general questions were adapted from Esteves et al. (2017) but other questions were added with the intention of analysing the effect of the use of Kahoot! in the context of Mathematics and English. For those questions a five-point Likert scale was used. For some questions, 1 corresponded to "not at all" and 5 to "very much", while in other questions 1 corresponded to "not important" and 5 to "very important". A statistical analysis of the data was performed using Excel and IBM Statistical Package for the Social Sciences (SPSS) version 26.

Following the general results in a previous article (Pais et al., 2018), a new perspective of data is presented in the current study, in light of the distinction between these two different subjects, so as to to identify the main dissimilarities between them.

2.1. Respondents

The respondents of this case study were 86 undergraduate students from a Portuguese higher education institution, in the academic year of 2017-2018. The curricular units (English for Events II, English for Recreation IV and Statistical Analysis) were set within Tourism-related degree courses. In particular, 32 were English students, whereas 54 were Statistical Analysis students.

3. Results and discussion

The highest mean score in both subjects is related to item 3 "It was fun using Kahoot!" (English: m = 4.78, sd = 0.491; Statistical Analysis: m=4.65, sd=0.555). Therefore, high scores in both items show that all students, regardless of the Curricular Unit attended find it fun to use Kahoot!.

As far as the lowest mean scores are concerned, results converge in both subjects with item 2 "Using Kahoot! will contribute to having a better grade in the CU". The results were m = 3.75, sd = 1.016 in English I and m = 3.43, sd = 0.983 for Statistical Analysis, as shown in the table below (Table 1). High standard deviation values seem to imply, however, that the students' opinion is not consensual. (English: sd=1.016; Statistical Analysis: sd=0.983). Also, despite being the lowest score, the mean is relatively high, as we can see in table 1.

The survey results corroborate that using Kahoot! provides a less rigid method of learning, makes it more interactive and interesting (Q9), makes classes more active, lively and dynamic (Q10) and that students recommend using Kahoot! (Q6). The results also indicate that the students consider it important for the teachers to resort to different teaching-learning methodologies such as Kahoot! in the classroom. However, this result does not appear to be highly consensual to the English students (sd=0.950).

The results on the platform's contribution to a more positive view of the CU show that, even though the mean is considerably high (superior to 4 in the 3 CUs), students' opinions are not consensual because they present a high value for the standard deviation (English: sd=0.907; Statistical Analysis: sd=1.060). The question "The response time in Kahoot! is adequate" also does not appear to be consensual among the English (sd=0.096) and Statistical Analysis students (sd=0.951), and the question "It facilitates the interaction between lecturer and student" does not appear consensual among the English students (sd=1.045). The average scores for both curricular units show that results are slightly higher in English (4.40) than in Statistical Analysis (4.21).

The survey results are presented in Table 1.

Table 1. Results of individual survey according to curricular unit.

	English			Statistical Analysis		
	Mean (1 to 5)	Std Dev	Median	Mean (1 to 5)	Std Dev	Median
1 - I believe that Kahoot! contributed to consolidate the contents of the CU.	4.06	1.014	4	4.09	0.875	4
2 - Using Kahoot! will contribute to having a better grade in the CU.	3.75	1.016	4	3.43	0.983	3
3 - It was fun using Kahoot!.	4.78	0.491	5	4.65	0.555	5
4 - The response time in Kahoot! was adequate.	4.31	0.896	4.5	4.04	0.951	4
5 - I find it important to be able to see the scoreboard.	4.25	0.803	4	3.81	1.150	4
6 - I recommend using Kahoot! in the classroom.	4.44	0.759	5	4.41	0.659	4.5
7 - It contributes to a more positive attitude towards English/ Mathematics.	4.38	0.907	5	4.17	1.060	4
8 - It makes learning more challenging, interesting and stimulating.	4.38	0.793	4	4.22	0.793	4
9 - It provides a less rigid learning method making it more interactive and interesting.	4.53	0.621	5	4.37	0.623	4
10 - It contributes towards more active, lively and dynamic classes.	4.56	0.564	5	4.50	0.575	5
11 - It facilitates the interaction between lecturer and student.	4.44	1.045	5	3.98	0.879	4
12 - I find it important for lecturers to use different strategies such as Kahoot! in the classroom.	4.47	0.950	5	4.48	0.720	5
Average score	4.40			4.21		

Regarding the question "Do you consider the use of Kahoot in classes to be important?", results are very high in both subjects (93,8% for English and 92,6% for Maths), with a slightly higher percentage for English.

As for the question "Did Kahoot! help you like the CU better?", results are also high (81,2% for English and 61,1% for Maths), but not as much as in the previous question. Moreover, in this question we can find a more pronounced difference between the two subjects (nearly 20%).

Regarding the general results, other studies show similar conclusions about the fact that higher education students finding the use of Kahoot! as fun and entertaining, particularly in Maths (Bullon et al., 2018).

More specifically, literature shows that Kahoot! can foster and reinforce English learning in undergraduate students, by inducing motivation as well as engagement (Bernal et al., 2018), providing a meaningful language learning experience (Kaur & Naderajan, 2019). In parallel, Maths students find this platform to be beneficial, as it allows them to "self-evaluate their learning process" (Curto Prieto et al. 2019, p. 10).

Furthermore, we can find evidence on how this platform can set up a positive atmosphere in more lively and dynamic classes in these specific subjects: "It was found that Kahoot! had a positive effect on learning both for K-12 and higher education, as well as for language learning, technical and engineering fields, science, math, business, and nursing" (Wang & Tahir, 2020, p. 12).

4. Conclusions

One of the main conclusions of this study is that students tend to show a very positive attitude towards the use of technology in general and specifically towards Kahoot!.

With regard to the differences between students' perceptions in two disparate subjects, namely English and Statistical Analysis, the survey results indicate that mean scores are generally similar, although they are slightly higher in English.

In sum, bearing in mind that Kahoot! provides "opportunities to engage with the lecturer, peers and lecture content" (Licorish et al., 2018, p. 21), it is the authors' belief that this study can positively contribute to disseminate new strategies that can impact students' motivation for learning and ultimately their academic performance.

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