Investigating the Impact of Kahoot! on Students' Engagement, Motivation, and Learning Outcomes: Ifrane Directorate as a case study

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Abstract

This paper shapes the landscape of an empirical research study on applying gamification to education. The study investigated students' instructional journey capitalizing on a game built around a student response system, called Kahoot! [Often cited as a descendant of "Personal Response Systems" (PRSs)]. The study targeted 97 students, aged between 16 and 18 years old (54 male and 43 female) belonging to three 2nd year baccalaureate classes at an EFL class in a public senior high school in Ifrane Directorate, Fes-Meknes Academy, Morocco. Data were collected using a survey whose reliability was tested. Quantitative data were statistically analyzed using descriptive statistics. The main goal of this study was to find out the impact of Kahoot! on engagement, motivation, learning outcomes, and attitudes towards ICT integration in future learning experiences. The research revealed that a large proportion of students were generally positive about ICT use in class practices, in general, and Kahoot! in particular. The findings are consistent with those of Plump and LaRosa (2017) and Wang   (2015) which came to the conclusion that students' motivation, engagement, and learning outcomes can be enhanced through game-based response systems, citing Kahoot! as a case in point.

Keywords: Gamification, Game-based Student Response Systems, Kahoot!, Classroom Dynamics, Engagement, Motivation.

Introduction

Technology has found a way to the heart of learners worldwide. Oftentimes Deemed as a catalyst, Information and Communication Technology (ICT) integration in numerous schools around the globe has shifted the pendulum of education, in general, and language education in particular, in favor of game-based student response systems (GSRS). As a new reality, Bring Your Own Device trend (BYOD) has spread like wildfire in diverse classrooms, inviting teachers and students to bring along a varied of set technological gadgets (Bradford-Networks,2013). The BYOD trend has enabled teachers and students to access a host of educational platforms. There are strong pieces of evidence that stresses the bond between learning by means of games and improved levels of engagement and motivation. In this regard, Prensky (2001) argues that pupils, across the globe, are gifted regarding the use of mobile technology, educational applications, and serious games, and are keen on using modern technologies to scaffold and upgrade their learning.

By large, recent evidence suggests that modern technologies and their extensions have invaded every single aspect of modern life. Being all the rage now, the widespread, and even rampant at times, use of Information Communication Technologies have changed the face of countless domains. They, undoubtedly, have broken the mould of education, pushing the teaching-learning process to the next level. In essence, research has consistently shown that once the technology is integrated into schools and classrooms, wonders happen. Again Prensky (2001) contends that technology can make learning points more appealing, engaging, and intriguing. Consistent with previous research, (Rosas et al., 2003) believe that GSRS upgrade classroom dynamics and foster students' interactions with classmates and teachers as well. According to Ellis, Heppell, Kirriemuir, Krotoski, & McFarlane (2006), game-based learning results in knowledge development and more engagement on the students' part are the by-products of game-based learning. Joining the debate, Papastergiou (2009) put forward that GSRS require participants to activate their

schemata, and gauge their performance on tasks while playing and learning some items. Ha adds that computer games, as ICT educational tools, have always impressed students, and made them assume a sense of responsibility for their own learning. Taking the debate further, Wang (2015) illustrates that there has been a shift in educational games systems. He claims that the pendulum has swung from student response systems (SRS) such as "clickers" and "zappers" in favor of more up-to-date game-based student response systems (GSRS), affirming that Kahoot! and Socrative systems serve as good examples. In line with Wang (2015), Hwang, and el. (2013) contend that game-based learning and serious games help bridge the gap between traditionally low-tech formal learning environment in rural areas and the "digital" generation of students on the other. In harmony with Hwang, and el. (2013), (Siegle (2015) insists that the use of educational games as pedagogic learning tools scaffolds students' development, positively affecting cognition, motivation, emotions, and social identities.

Kiili (2005) confirms that students can at times learn the correct actions and answers through trial and error. He states that educational games are activity-driven learning tools that often require students to complete special "missions" in order to advance their learning. Further, E-learning experts state forty years of research says 'yes' to game-based learning; games are effective learning tools. Boller (2012) explains that students learn a lot from games, and in terms of learning rates, and they learn much more from a game than from other forms of learning". Base on various studies, Game-based learning benefits the teaching-learning process. With this in mind, the study at hand incorporated Kahoot! as a game-based learning platform. The investigation was undertaken to address the following questions:

1. To what extent does Kahoot! enhance students' engagement and motivation towards learning English language learning?
2. Are students in the target group satisfied with the language outcome developed using Kahoot!?

3. To what extent are students in the targeted group interested in trying ICT technologies in future learning experiences?

Review of literature

2.1. Gamification

Recently, researchers and ICT experts have shown an increasing interest in gamifying the English as a foreign language (EFL) classroom. Various are the definitions ascribed to the concept gamification in the literature. Gamification, as a newly emerging term, was well defined and clearly demarked by the pioneers, Deterding, Dixon, Khaled, and Nacke education (2011). In this respect, they affirm the term came into existence sometime around 2008. Becker (2007) contends that it is used in multifarious domains for several reasons and at every level of education. Gamification grew in popularity, gained new grounds in many publications. Jane McGonical (2011), in her seminal work, "Reality is Broken" confirms that the use of games does not need to be focused only in alone entertainment and that skills developed during the game are useful to solve real-life issues. The aforementioned definition has been endorsed by Deterding et al. (2011) and Xu (2011). Recent studies claim that gamification is receiving much recognition as a solid e-learning tool. According to Kapp (2012) offers a scope wherein students can get immediate feedback on their performance and progress in class. (Sharples (2000) reports that games in tertiary education, boost academic achievement, motivation and classroom dynamics. In turn, Law, Kasirun, &Gan (2011) indicate that game mechanics and game dynamics are marking features that soar high in the skies of gamification. Interestingly, Liu, Alexandrova, & Nakajima (2011) contest that games grant rewards, usually given through a scoring system 18]. Again, Bunchball (2010) reiterates that a website or an application is gamified via game mechanics built up by special tools, techniques, and widgets. In this respect, Kirriemuir& McFarlane, 2004) games sustain learners' interest by combining curiosity, challenge, fantasy, a level of. According to Becker (2001), games are of great value in that they serve as a vehicle for teaching concepts in inspiring ways at almost all levels of education". Taking the debate further, W. Hsin-Yuan Huang, D. Soman (2013) argue that gamification is has a wide-ranging impact on learners, affecting their knowledge, skills, behavior, commitment, and motivation.

2. Kahoot! as a Popular Gamification Tool
Prensky (2005) stressed that learning games are effective tools and can serve multifarious purposes ranging from the teaching of various skills, behavior patterns, theories, languages, creativity to communication. Among the most popular gamification tools are Socrative, Kahoot!,FlipQuiz, Duolingo, Ribbon Hero, ClassDojo and Goalbook. These tools are web-based (cloud services) and do not require installation of special software and allow access at any time and from any location. Speaking of the history of Kahoot!, Jamie Brooker and Johan Brand designed the game in 2015, as a game- based classroom response system to be played by the whole class in real time. The main reasons behind developing Kahoot!, as a free Personal Response System, were to administer quizzes, facilitate discussions, or collect survey data. Wang (2015) claims that such a GSRS, Kahoot! allows teachers to

draw on course content to construct quizzes in which students participate as players in "game-show" thus integrating gamification principles (e.g. audio and a scoreboard with a points system) into an informal assessment procedure. Plump and LaRosa (2017) found that Kahoot! was easy for teachers to use in their classroom and required no prior training to implement. For instance, teachers can easily utilize Kahoot! to project quiz questions as regular lecture slides to which students respond using a web browser on their digital devices. Instructional experts Gagne and Driscoll (1988) explain that one of the first elements needed for learning is to gain students' attention. The music, colors, and excitement brought by Kahoot! encourage student focus and can excite a classroom.

Methods and procedures
3.1. Participants
The researchers adhered to purposive procedures taking into account knowledge of, easy access to the population of interest and the aims of the study. Therefore, the study at hand was conducted in three 2nd Year Bac classes at a public school with a total of 97 students who were attending a senior high school, at the Directorate of Ifrane, Meknes-Fes Academy. Students were aged between 16 and18 years old (54 male and 43 female). 44.3% of the participants were male, and 55.7% were female. Accordingly, female participants outnumbered male participants. The research was developed on the subject of English as a second foreign language

3.2. Procedures
With a view to meeting the objectives of this investigation a single platform was singled out, which was Kahoot! The c h o s e n platform was evaluated based on three criteria: Freeware, Customizable, and ease of Class Management. The selected platform adheres to the criteria established earlier on and to the objectives proposed in this work as well. In terms of ethics, the research capitalized on two types of informed consent: parental and institutional informed consents. The researchers invested much effort to ascertain that no aspect of this study was harmful or abusive to students or anyone else involved. Students' responses were completely anonymous because the survey was completed using Google Docs. The teacher was able to see they submitted the survey but was not be able to identify the students' individual responses. This was done by ensuring that the survey did not collect individual student emails and thus did not track the exact responses of individual students. Kahoot! was utilized to evaluate the effectiveness of gamified platforms as a strategy to raise students' levels of engagement and motivation. At the end of the sessions in which Kahoot!s were used, students logged into Kahoot!.it, and afterward, they entered the required PIN. Then, the teacher would display questions. Once a question is displayed on the screen, the teacher asked students to click on the correct option. There was a countdown timer on the screen to keep students on-task, under pressure, and in a competitive spirit. The type and complexity of questions determine time limits, 10-20 seconds to come up with answers to questions displayed on the screen using their mobile phones or tablets. By default, the software kept track of students' answers, providing up-to-date reports on students' performance on tasks. Answers were visible on the screen throughout. When the time allotted was over, the correct answer was shown on screen. Students' answers were shown in a bar graph form in a statistical fashion (shown as a number). The materials used during the test sessions consisted of sets of multiple choice questions that checked the students' understanding of the material of each unit, vocabulary and grammar review, and quizzes, etc.

3.3. Data Collection
The present study implemented the survey approach and reports results using a descriptive design based on quantitative data. The researchers designed and utilized a comprehensive questionnaire comprising close-ended (five-point Likert scale) items. It was developed based on an inclusive analysis of previous related literature and their validity and reliability were seriously and rigorously verified (Plump, C. M., & LaRosa, J. (2017). According to Nelson (2008), in her work on survey research methods, such measures in a survey instrument enable researchers to investigate thoroughly quantitative empirical premises. The survey was administered via google docs. By large, the instrument used a Likert-scale, in which students' perceptions about the use of Kahoot! across the course and how technology affects their class engagement, collaboration, and learning performance. It had 18 (eighteen) closed questions, in groups of 3 (three) sets, that range from strongly disagree (1) to strongly agree (5). Table (1) indicates the alpha reliability of scales.

Table (1):The alpha reliability of scales

Table 1: a summary of the questionnaire scales internal consistency	
Scales	Cronbach's alpha
Learning motivation (7 items)	*,954*
Language learning Outcomes (6 items)	*,895*
Students' perceptions of using ICT in learning! (5 items)	*,974*

Identified hereafter: First part had 7 (seven) questions about the profile of the students and their experience with Kahoot! in terms of classroom interaction, engagement, and motivation; Second part had 6 (six) questions measuring the impact of Kahoot! use on their learning outcomes; Third part had 5 (five) questions examining students' perceptions and attitudes towards using Kahoot! in future learning experiences. The questionnaire was processed quantitatively and was descriptively presented in tables.

Results

This section discusses the data collected on this research regarding using Kahoot! as a catalyst for more motivation and improved in-class performance. The collected data were analyzed with SPSS. Based on the survey results, closed-ended questions, students' perceptions toward this study can be categorized into the following areas:

–**Students' levels of engagement and motivation**
– **Language learning outcomes**
–**Interest in trying ICT in future learning experiences**

Table 2: Results for Learning motivation Items in the survey

Learning motivation items in the survey	*Mean*	*SA (%)*	*A (%)*	*N (%)*	*D (%)*	*SD (%)*
1. *Kahoot! has allowed me to stay focused in class.*	4.02	22.73	61.98	10.38	5.22	0.00
2. *Kahoot! has given me the chance to share my ideas in English with my teacher.*	3.96	26.84	55.77	4.13	13.48	0.00
3. *Kahoot! has encouraged me to competitively interact in class*	3.98	24.78	58.88	6.27	10.32	0.00
4. *Kahoot! has increased the spirit of collaboration among students*	3.79	20.66	63.97	7.24	8.24	0.00
5. *Kahoot! has allowed me to get immediate feedback from the teacher*	3.45	10.31	48.54	18.65	21.65	0.00
6. *I feel comfortable when interacting online via Kahoot!.*	4.05	38.18	44.31	2.18	15.53	0.00
7. *The online activities shared on Kahoot! are diverse and interesting.*	3.93	17.55	67.04	6.25	9.36	0.00

Tables 2-4 present the results of the questionnaire in the 3 areas, with the overall means (m) ranked for each item in these 3 areas, along with their respective standard deviations (SD). Tables portray also the percentage of responses (p) by students according to the 5-point Likert scale (i.e., SA = Strongly Agree, A= Agree, N = Neutral, D = Disagree, and SDA = Strongly Disagree).

Table 2 provides an overview of students' motivation levels. Serving as a piece of evidence, table 2 shows that students were keen on learning English via Kahoot! Students reported that Kahoot! The platform, is very diverse and interesting,

encouraged them to stay focused in class, to exchange their ideas in English with their teacher, to competitively interact in class, to collaborate with classmates, to get immediate feedback from the teacher, and to interact online.

– Most of the students (67.0 %) reported that the online activities shared on Kahoot! are diverse and interesting.
– 63.97 % of them stated that Kahoot! has increased their spirit of collaboration and cooperation in class (M=3.79).

– 61.98 % of students indicated Kahoot! has allowed them to stay focused in class (M =4.02).

In a nutshell, (Table 2) demonstrates that students were motivated because of Kahoot! Platform whetted their appetite for learning and sustained their curiosity throughout the course.

Table 3: Results for Language learning Outcomes Items in the survey

Language learning Outcomes Items in the survey	*Mean*	*SA (%)*	*A (%)*	*N (%)*	*D (%)*	*SD (%)*
1. I have enjoyed studying English on Kahoot!.	4.00	30.90	53.64	0.00	15.56	0.00
2. Kahoot! has helped me better my speaking skills.	3.53	7.25	59.88	11.39	21.62	0.00
3. I feel that Kahoot! has contributed to the process of enriching my English.	4.01	36.12	45.46	2.12	16.59	0.00
4. I feel Kahoot! has helped me develop my writing skills.	2.91	2.18	33.09	18.67	46.46	0.00
5. I feel that Kahoot! has helped me improve my listening skills.	3.19	2.12	50.51	11.36	36.14	0.00
6. I think that Kahoot! has allowed me to reinforce my understanding of English.	3.73	3.15	80.45	3.18	13.42	0.00

Results in Table 3 showed that students' linguistic experience with Kahoot! was very rewarding.
– 80.45% of students believed that Kahoot! has allowed them to reinforce and consolidate their understanding of English.
– 59.88 % contested that Kahoot! has helped them better their speaking skills and improve their presentation skills (M = 3.53).
– They also felt that Kahoot! has helped them improve their listening skills (M= 3.19, P=50.51).
– They have stated that now have become better writers (M=2.91, P=33.09).

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Table 4: Results for Students' perceptions of using ICT in learning!

Students' perceptions of using Kahoot!	*Mean*	*SA (%)*	*A (%)*	*N (%)*	*D (%)*	*SD (%)*
1. I think that Kahoot! is suitable to use in English learning classrooms.	3.82	6.28	77.35	9.34	7.25	0.00
2. Kahoot! has positively shaped my perception of online learning.	3.79	8.27	75.35	4.18	12.44	0.00
3. Kahoot! has encouraged me to use social media for educational purposes.	3.75	4.13	79.40	4.14	12.42	0.00
4. I have become interested in trying future online learning experiences.	3.74	5.22	77.33	4.18	13.47	0.00
5. I encourage my friends to try online learning experiences if they are offered the opportunity.	3.74	5.21	78.47	2.13	14.43	0.00

Shedding more light on students' perceptions towards using ICT in future learning, results confirm that:
  − Kahoot! has encouraged students to use social media for educational purposes (M = 3.75, P = 79.40%).
  − They also reported that they encouraged their friends to try online learning experiences if they are offered the opportunity. (M =3.74, P = 78.47%).
  − Kahoot! has positively shaped their perception of online learning (M = 3.75, p = 75.35%).
  − They also expressed excitement with the innovative way information was presented via Kahoot! Platform (M = 3.82, p = 77.35%).
  − Students have become interested in trying future online learning experiences, especially those which involve interaction and fun (M =3.74, P =77.33%).

Discussion

This study examined the effectiveness of a digital tool called Kahoot!. The objective was to see whether consistent use of this application would increase students' engagement, motivation, learning outcomes, and get much insight students' perceptions towards ICT integration in-class practice in general, and Kahoot! in particular. This study met the goals discussed above by achieving improved levels of engagement, achievement, and more satisfaction and readiness to deploy ICT tools in future learning experiences. According to previous studies (Martin 2008; Pintrich and Schrauben 1992), students' low participation rates could be attributed to lack of that motivation and engagement [24]. They affirm the latter significantly impact learning and may be critical to academic success. The study at hand investigated how the integration of gamified Platforms and Kahoot! could positively impact students' motivation, engagement, and learning outcomes.

1. Kahoot! has tremendously enhanced Students' engagement and motivation to learn the English language.
The study results support previous research in supporting the use of Kahoot! in fostering our understanding of enhanced lecturer-student engagement, and more constructive discussions with peers (Plump and LaRosa 2017; Wang 2015). The findings may be explained by the fact that Kahoot! allowed much room and space for students to engage and interact with the teacher and classmates alike, especially when students were driven to see their names at the top of the leader board. This resulted in more attention, engagement, and motivation. This finding is an agreement with Wang's (2015) findings which showed the positive effects of GSRS, namely Kahoot!, on enhanced attention and "healthy" competition. Wang, Zhu, and Sætre (2016) pointed out that Kahoot! represents a new generation of student response systems that focuses on student motivation and engagement through

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gamification. This platform is apt for increasing motivation and engagement (which promotes learning), and for assessing students' understanding of a lesson.

2.   Students' satisfaction with the language outcomes developed using Kahoot!.
The current study found that Kahoot! drives to perform well in class. Students affirmed that the use of Kahoot! had a positive impact on learning outcomes. Kahoot! helped them boost their listening and speaking skills. The findings corroborate the ideas of Ismail and Mohammad (2017), Méndez and Slisko(2013) [25], Plump and LaRosa (2017) who previously demonstrated the positive impact of GSRS use on learning, and is consistent with Novak's (1998) model of meaningful learning as well[26]. Several are the researchers who have studied the effects of educational games with regards to learning outcomes and motivation levels. Papastergiou's (2009) study's participants stated that the game-based learning approach paves the way for more engaging, effective and active learning to come into play.

3.   Students' interest in trying ICT in future learning experiences.
Students conceded that the game, Kahoot!, brings a lot of interaction to the classroom. The majority of students reiterated that they enjoyed the competitive nature of the game and commented that it helped them retain concepts. These findings further support the idea of Thomas Malone's theory of intrinsically motivating instructions (Malone, 1980). This theory indicates three categories that make learning fun: 1) challenge (goals with uncertain outcomes), 2) fantasy (captivation through intrinsic or extrinsic fantasy), and 3) curiosity (sensor curiosity through graphics and audio, and cognitive curiosity). According to Malone (1980), game-based learning approaches whet students' interest in the target subject seeing that they enjoy (or experience pleasure) as they learn, and thus are more engaged and focused on the subject, and more willing to experience ICT technologies in future learning episodes.

Conclusion

The study at hand was designed to determine students' perceptions towards the integration of gamification into the teaching-learning process. In this investigation, the aim was to assess to what extent Kahoot! leads to more students' engagement and motivation, improved learning outcomes, and more willingness and readiness to try Kahoot! in future learning experiences. The most obvious finding of this study is that teachers should teach Digital natives, the Net generation, the Google generation or the Millennials the way they want to learn. They want to digitally learn through games. In line with previous studies, gamifying the teaching-learning process has become an obligation, not an option. In essence, Modern technology, ICT utilization in-class practice, does make a difference. As stated earlier on, Kahoot! is one of the most successful educational technologies in history that seeks radical disruption in education via popularizing new psychological theories of engagement and motivation. ICT integration and incorporation, in the form of game-based response systems, exemplified by Kahoot! in the study at hand, would significantly boost and upgrade classroom practices and push them to the next level worldwide.

Limitations
Despite the fact that the study at hand provided a number of insights, the researcher acknowledges that there are a number of shortcomings and drawbacks that may potentially affect the reliability and validity of the study results. On the one hand, speaking of participants' background, the students' perceptions towards the use of Kahoot! may be influenced by their background, and thus, this is to be considered when interpreting our findings. On the other hand, the study was quantitative in nature. The quantitative data included closed-end information that underwent statistical analysis and resulted in a numerical representation. The use of qualitative data could have helped gain a deeper insight into the subject.

Future Works
Future work will be more qualitative in nature. The upcoming analysis of the qualitative data will take the form of words, text or behavior patterns. The future study will focus on using Kahoot! with a small number of students and different subjects and assess students' experience to get a deeper insight into why students have developed such a great liking for the Kahoot! Platform and sustained their interest throughout the course. Such a study will surely allow for the "voice" of the participants, students, to be heard by means of interpreting potential observations and focus groups interviews.

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