Research article

Gender differences in utilizing a game-based approach within the EFL online classrooms

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ABSTRACT

Implementation of digital tools has become a popular practice by teachers to increase student involvement within the classroom. Various technologies are being utilized by educators to help students engage with lessons and enjoy the overall learning experience. Additionally, findings from recent research have indicated that the adoption of digital tools has influenced the learning gaps between genders, specifically in relation to student preferences and gender differences. Despite significant educational development toward gender equality, there is still ambiguity regarding the learning needs and preferences of male and female students within the EFL classroom. The current study examined gender differences in engagement and motivation while using Kahoot! in EFL English literature courses. The study recruited 276 undergraduate female and male students from two English language classes (i.e., both classes were taught by the same male instructor) and surveyed 154 female and 79 male students from those classrooms. The significance of the study lies in determining whether gender impacts the way learners perceive and experience game-based curricula. In this sense, the research found that gender does not, in fact, impact the learner's level of motivation and engagement within game-based classrooms. A *t*-test revealed that no significant difference between male and female participants had been observed by the instructor. Future studies could fruitfully examine gender differences and preferences in digitized educational settings. Further work is certainly required for policymakers, institutions, and practitioners to disentangle the complexities regarding the role of gender in shaping the experiences of learners in the digital era. In future research, more research is needed to apply and test external factors like age that might impact learners' perception and performance in a game-based curriculum.

1. Introduction

During the COVID-19 pandemic, education experienced an extreme transformation [1] in learning tools. While remote learning was utilized in the Kingdom of Saudi Arabia (KSA), it was largely implemented during the pandemic period [2]. This sudden shift from in-person schooling to online learning has brought forth the integral part that digitalization brings into education. In KSA, the digitalization of teaching and learning has been widely used to keep pace with the 21st century needs and the Kingdom's Vision 2030 [3].

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Therefore, the Covid-19 pandemic forced educators who might have been reluctant to use technology in the past to embrace it as the world moved towards online learning and allowed young students to embrace the technological world they live in Oraif & Elyas [4].

Increasingly, students from Generation Z (i.e., Gen Z, those born after 1999) and beyond have become more interested in learning through mobile apps rather than traditional methods (Poláková & Klímová [5]; p. 2). Recent studies [5–9] found that Gen Z has different needs, expectations, and learning styles that tremendously benefit from the use of mobile devices in the English language classroom. Researchers [8] found that using technological tools helped teachers form a bond with their students (i. e., better communication, and pedagogical relationship). By using technology, teachers could attract their students to the lesson, creating a positive learning environment where students feel connected with their teachers (Attard & Holmes [8]; p. 5). While mobile devices and technological tools have been used before in classrooms and for learning purposes, the 2020 shift to online education has definitely increased this implementation (Poláková & Klímová [5]; p. 5).

One main mobile app and an online tool that has been utilized heavily for learning purposes is Kahoot!. Kahoot! is a digital game that helps teachers capture learners' perceptions and understanding of a given lesson (Wang [10]; p. 220). Researchers [11,12] found Kahoot! to be quite an effective learning tool for incorporating gamification into the university-level classroom. It created a new learning environment where students can enhance skills like problem-solving by observing their lecturer, then exploring their newfound knowledge by competing with one another using Kahoot!'s quizzes [11].

While many researchers explored Kahoot! as a learning tool, some questions remain regarding the effectiveness of the implementation of digital game-based learning. Specifically, the main concern is that there is limited research done exploring the use and impact of Kahoot! and other digital games on learners. Moreover, there still exists a debate on how gender roles can differentially impact the learner's motivation and engagement within the classroom, which is a very crucial concern that is lacking research attention, especially in regard to gender-specific data on EFL students' levels of motivation and interest. Nonetheless, few recent studies have highlighted a difference in the perceptions and attitudes of female and male students within game-based classrooms (i.e., Apriani et al. [13], Hou [14] and Khan et al. [15]). When examining secondary school students' perception of using digital games, Khan et al. [15] concluded that though female and male students share many similarities in perceiving gamification, there are a lot of differences between them as well. The researchers found that at certain levels of the experiment, female students exhibited a higher rate of "positive body language" than male students (p. 2779).

Other previous studies (i.e., Apriani et al. [13], Hou [14] and Khan et al. [15]) conclude that female students are different in perception and performance. Moreover, they outperform male students in classroom gamification. Apriani et al. [13] found that within digital-based EFL classrooms, female students are performing at a level that is "slightly higher than that of male students" (p. 197). Similarly, Hou [14] concluded that EFL learners, especially females whose proficiency in the target language was excellent, "had stronger motivation for English learning" (p. 36). Meanwhile, Ismail and Mohammad [16] found that male students outperform female students in game-based EFL classrooms. They also found that male students exhibited a higher rate of motivation than female students.

Contrary to the main argument that there are some differences between female and male students' performance when adopting digital games, some studies are opposed by claiming that there are no differences in EFL classrooms [12,17,18]. Wang et al. [18] noted that although genders out-perform each other on certain levels of testing (adopting a *t*-test for examining "game flow play," testing "anxiety," "Continuous gameplay intention," and "Gameplay progress and performance"), the overall comparison did not show any significant differences between female and male students (p. 122).

Due to the inconsistency in research shown above concerning differences in gender perception and gamification performance, the subject matter has attracted more attention in the field of EFL learning and the implementation of games, specifically in Saudi EFL classrooms. Therefore, the current study aims to examine gender differences in perceiving Kahoot! in EFL online classrooms. The study seeks to answer the following research question: T*o what extent, if any, does the use of Kahoot! within the learning environment differ with respect to gender?*

2. Literature review

2.1. Theoretical framework

Social constructivism theory was first initiated by Vygotsky [33], who referred to social constructivism as a social or communicative approach to learning, "the social constructivist sees knowledge as what students do in collaboration with other students, teachers and peers" (as cited in Apkan, et al. [19]; p. 50–51). Communication and collaborative learning are essential for the development of student's knowledge and performance and for building a sense of social "connectedness," which ultimately influences the "quality of learning" (Almusharraf [2]; p. 3948–3950). Within an environment that is built upon social constructivism, the understanding and construction of given information are solely based on each learner's experience and processing of information (Mogashoa [20]; p. 52). Therefore, the current study is based on the premises of the social constructivist theory to determine and explore if gender (an external factor) plays a role in influencing students' perceptions of game-based EFL classrooms.

2.2. KSA gender-segregated education system

KSA adopts a gender-segregated education system where female and male students are taught separately (Alrashidi & Phan [21]; p. 34–35). This approach has increased research in numerous comparative educational studies concerning using games in the classroom and exploring differences between gender perception and performance, especially in EFL classrooms [2,4,22,23]. Due to technological advancement, one area of research that has surfaced in recent years is integrating the digital world into the classroom, precisely using

gamification to enhance the teaching and learning experience for faculty and students. With the unfortunate Covid-19 Pandemic, educational sectors worldwide were forced to abandon the traditional classroom and adopt a fully digitalized approach to education; this gave room for teachers and educators to integrate fun digital learning tools, including games like Quizlet, Kahoot!, and many more (Al-Mubireek [22]; p. 205–206).

2.3. Gamification in EFL classrooms

Gamification is the implementation of games in classrooms for learning purposes. A game-based approach to teaching/learning involves students' participation in games of all kinds, like Kahoot!, Quizlet, Pictionary, Hangman, or even puzzles. The aim is to build an enjoyable experience for learners and enhance their engagement and understanding of the lesson; since experiencing gamification in the classroom can help students become attentive and motivated [10]. Thus, previous literature focused heavily on examining how the implementation of games into different educational contexts assists students and aids in developing their education rather than hindering it.

One example of gamification that this study further investigates is Kahoot!, which focuses on capturing the learners' perception and understanding of the lesson under the guise of a "gameshow" where the students are "the players," and the teacher is the "game-show host" to make learning more fun and engaging (Wang [10]; p. 220). Recently, Kahoot! has become a popular game amongst instructors due to its highly intriguing and enjoyable nature. Many studies focus on education, the dynamics between learner and subject, and the use of GSRS (game-based student response systems), specifically Kahoot! [2,10,12,17,24–27] show outstanding results.

In a study that examined students' responses to gamification [10], the researchers used Kahoot! with two groups of students; one was experienced in using Kahoot! and had used it for a longer period than the other group. Both groups agreed that using Kahoot! for learning purposes was very beneficial and easy. The participants showed significant development in understanding the lesson and in communicating with each other in the classroom (p. 223). Furthermore, both groups showed increased engagement with the lesson (p. 227). This proves that using Kahoot! is very useful in creating a better learning environment for students.

On the other hand, another study by Aljaloud et al. [28] focused on Student Response System (SRS) and showed that some games could be more distracting than anticipated. At the same time, it is good to note that the study [28] also stressed the importance of Kahoot! and other games alike in influencing students' engagement, separating Kahoot! from other games. "Kahoot! have synthesized the best aspects of SRS" (p. 323). Even though this study investigated how ineffective gamification can be regarding learners' involvement, it still highlighted that certain types of games, like Kahoot!, presented great results.

More recent studies [24,27,29] argued that the general use of gamification builds a positive learning environment and attitude for the students. Licorish et al. [24] examined how attentive the students were after implementing Kahoot!. The participants all agreed that Kahoot! generates a positive environment for them by increasing their excitement and attention (p. 11). Thus, Kahoot! plays a significant role in shaping the level of engagement and learner's involvement within the classroom. Wang and Tahir's [27] systematic literature focuses on how Kahoot! could possibly substitute the traditional way of learning. In this sense, Kahoot! not only helped with students' involvement but was a far more reliable source of assessment than other traditional tools (p. 6–7). The majority of recent studies (quasi-experiments) showed positive results with the use of Kahoot! in the classroom [24,27,29], "including improved class attendance, higher downloads of course material, improved classroom dynamics, and higher final grade" (Wang & Tahir [27]; p. 8). This shows that Kahoot! and other games alike greatly influence the learning process.

Another study conducted more recently [2] specifically targeted assessing the effectiveness of Kahoot!. It called attention to the many benefits of its incorporation and, in part, addressed the question regarding Kahoot!'s influence on the learning process. The results included a significant increase in students' engagement and performance, teamwork, and motivation in the classroom (p. 9). Hence, the study highlighted Kahoot!'s! effectiveness in developing students' actual learning.

2.4. Gender differences in game-based EFL classrooms

When it comes to the question regarding the influence of gender on students' level of engagement, one study [15] that examined the use of digital games in the classroom argued that students build or develop a preference with gamification that varied depending on their gender. In this sense, the researchers found that male students prefer to "play action games" while female students like to use "virtual" or "stimulation and puzzle games" (Khan et al. [15]; p. 2772). Furthermore, the study showed that students' interest and involvement rely heavily on their "preference," which determines their level of motivation.

The notion that game preference influences motivation in the classroom puts into question how gender can differentiate between students' levels of engagement. In Emerson et al. [30], the focus was laid heavily on the students' interactions with the games (p. 3–4). It examined how various elements (both internal and external) had a great impact on students' level of engagement and involvement with gamification (Emerson et al. [30]; p. 12). This proves that many factors play a role in determining the students' level of interest, including gender.

Wang et al. [18] conducted an analysis of gender differences in a digitized classroom to examine students' overall progress and development and found that male students were at a disadvantage in comparison to female students. Female students reported a higher rate of progress and "gameplay flow" (p. 122). Similarly, Khan et al. [15] found that female students outperformed male students on numerous levels of testing. The study determined that although female and male students both exhibited an increase in lesson perception and performance, female students were a little ahead when it came to measuring "positive body language" and "engagement" (p. 2780–2781).

Moreover, another study that examined Kahoot! as a formative tool that encourages and develops learning amongst medical

students in Malaysia showed the opposite findings. Male students exhibited a much higher score in "motivation and knowledge retention" (Ismail & Mohammad [16]; p. 24). The study further highlighted that male students displayed more interest than female students in game-based approaches regarding their learning.

Quite the contrary, some recent research argued that, in fact, gender does not play a role in influencing students' perception and performance in gamification. Although not focused on investigating gender differences, Almusharraf [2] showed that gender does not influence engagement in the lesson. While examining the use of Kahoot! in EFL classrooms (both female and male students), the researchers did not locate a significant difference in students' perception and performance (Almusharraf [2]; p. 9). Additionally, in another recent research by Korkmaz and Öz [12] examining the use of Kahoot! for developing reading comprehension purposes, the researchers further investigated gender variable attitudes towards game-based approaches and found that there wasn't any "difference between the learners' attitude toward Kahoot game and gender variable" (p. 1144). Korkmaz and Öz's [12] study highlighted that although female and male students view games from different perspectives, they did not show many differences in their engagement and performance when using Kahoot!.

Previous research has varied drastically regarding the question of the influence of gender differences on the level of perception and performance in game-based classrooms. Therefore, this study aims to provide a definitive answer regarding the impact of gender differences on engagement in game-based EFL classrooms, specifically among Saudi EFL students.

3. Method

This paper is part of a larger project dealing with the implementation of gamification in EFL online classrooms [2]. Almusharraf's [2] paper focused on students' engagement in game-based classrooms overall. However, this current study seeks to explore the extent to which gender can act as a factor in the utilization of gamification in Saudi EFL classrooms. In this sense, the following research examines whether gender influences the level of students' involvement in the classroom. The study collected quantitative data through an online survey from early May to late July 2020.

3.1. Participants' background

Of the two classes, 233 participants completed the survey. The participants were junior and senior EFL students in an undergraduate program from the English department of a public university in Saudi Arabia. 154 (66.1%) of the participants were female, and 79 (33.9%) were male. Of the total number of participants, 19 (8.2%) were 18 years of age or under, while 168 (72.1%) were between the ages of 19 and 24, classifying the remaining 46 (19.7%) between 25 and 30 years of age. All of the participants' level of English language proficiency was sufficient enough to understand the survey fully without Arabic translation, as they had either passed the university's entrance exam and preparatory year program (PYP) or had passed the IELTS with a score of 5.5 or the TOEFL with a score between 46 and 59 which exempts them from the PYP.

3.2. Instructor's background

The course's instructor was a Ph.D. holder in English Literature. He has previously taught English literature courses to EFL learners and was given the proper instructions on how to use Kahoot!, thus making him qualified to deliver this course for the purposes of this paper.

3.3. The course

Participants were enrolled in a 3rd-year English literature course in two concurrent sections (Section 1 had 109 females and 63 males [172 total], and section 2 had 67 females and 37 males [104 total]). This course aimed to help students understand concepts in the literature that are related to cultural, social, historical, and political issues. The three-credit course, which ran online for six weeks, was designed for non-native English learners. The class met three times each week, with a 2-h long class each time. Both sections were taught by the same instructor using the same methods, materials, and online learning platforms (i.e., Blackboard).

Engaging students was the main challenge for this course, considering the online environment and the fact that the course also included materials on historical background and some terminologies. As such, this particular course was a good fit for this study examining the use of Kahoot! within the classroom and adequately comparing students' engagement and motivation when considering the gender factor.

Lectures in this course were conducted online, using PowerPoint for lecturing and Kahoot! as a review tool. Traditional instruction (PowerPoint lectures) was used twice a week, while Kahoot! was used to review once a week. All students involved were familiar with Kahoot! and used it for both individual and group work throughout the course. While student participation in the survey of this study was entirely voluntary and had no bearing on their final grade, their participation in Kahoot was required as part of their active participation grade.

Since the instructor had no prior knowledge of creating Kahoot! activities, the researchers were responsible for creating the Kahoot! review tasks throughout the duration of the course. The instructor, however, was the one presenting and interacting with the students during these Kahoot! sessions. The researchers included activities based on what students had learned in their classes and utilized Kahoot! in various ways, such as individual activities, group competitions, and study guides. This helped the participants experience Kahoot! and game-based learning in varying ways before sharing their perceptions via the online survey.

3.4. The survey

The survey created for this study, as in Almusharraf's [2] study, was adapted and further modified from the survey Bicen and Kocakoyun [32] used in their paper. It mainly focused on deriving results regarding the participants' perceptions of Kahoot!'s functionality and impact. The researchers were careful to measure the reliability and validity of this survey through pilot testing and field testing. There were four main subscales throughout this survey: motivation to learn (7 items, α = 0.84), impact on teaching and learning (8 items, α = 0.87), influence on affective characteristics (8 items, α = 0.88), and Kahoot's design functionality (11 items, α = 0.90). The Likert scale (strongly disagree, disagree, undecided, agree, strongly agree) was used to answer all subscales.

LimeSurvey was used in creating and distributing the survey used in this study. The researchers explained the survey items to the participants during their class time to ensure full understanding before they participated in the survey. Towards the end of the summer term in which this research was conducted, the survey was made available in July 2020 and kept open for eight weeks until August 2020. Participants were informed through the survey's welcoming message that their completion of the survey was also their consent to participate in this research.

While the course instructor was involved in reminding participants to complete the survey, they were informed that all results were only obtainable by the researchers. The students were made aware that their instructor had no access to the data of this study, and they were given sufficient time to complete the survey. They were also told that all answers would be de-identified and no extra credit would be awarded to them within their classes, which allowed the participants to answer all items openly and freely. Out of a total of 276 in both sections, 233 completed the survey. The number of female students who answered the survey was higher than the males, with 154 to 79 responses respectively.

4. Results

4.1. Survey data analysis

Using SPSS (version 26), the researchers calculated the mean and standard deviation for each subscale for the number of participants for each gender. In each question, participants' responses collapsed into the subscale categories (see Table 1).

The researchers ran an independent samples *t*-test to compare the different genders for each subscale. It was evident that there was not a significant difference between female and male participants when it came to the perception of their motivation to learn using Kahoot!, $t(231) = -1.14$, $p = .254$. Similarly, there was not a significant difference in the participants' perception when it came to Kahoot!'s impact on teaching and learning, $t(231) = 0.26$, $p = .798$; Kahoot's influence on affective characteristics, $t(231) = 0.16$, $p = .874$; or the functionality of Kahoot!'s design, $t(231) = 1.69$, $p = .092$.

5. Discussion

With the sudden transition from traditional learning to a more digital-based education, new approaches involving the adaptation of technology, online platforms, and, most importantly, digital games have emerged (Singh et al. [31]; p. 12253). In this sense, educators began to indulge in fun and exciting means to increase students' involvement and encourage learning, especially since the start of the pandemic. There has been a growing utilization of games like Kahoot! by educators to assist their students' motivation and increase their interest within the classroom [2,12,15,18].

Using Kahoot! and other digital games definitely encourage students and help them with their perception and performance within the lesson by building a positive and fun environment [2]. Nevertheless, concerns regarding the ways digital games influence students' motivation were evident in previous research. One remaining concern is whether students' motivation and engagement with Kahoot! is perceived differently depending on students' gender. Thus, the current study investigated whether gender plays a role in the level of students' motivation, engagement, and performance when adopting Kahoot! in EFL classrooms, asking the question, '*To what extent, if any, does the utilization of Kahoot within the learning environment differ with respect to gender?*'

Table 1
Participants' responses of each subscale categories.

Variable	Group	M	SD
Motivation to learn	All	4.35	0.55
	Female	4.32	0.57
	Male	4.41	0.52
Impact on teaching and learning	All	4.35	0.54
	Female	4.36	0.55
	Male	4.33	0.54
Influence on affective characteristics	All	4.22	0.66
	Female	4.23	0.70
	Male	4.21	0.56
The functionality of Kahoot!'s design	All	4.18	0.49
	Female	4.22	0.48
	Male	4.10	0.49

The study adopted Vygotsky's Social Constructivist theory (Vygotsky's Social Constructivist theory, [33], which entails that meaning-making depends on experience and external factors. Precisely, knowledge is built through social communication; learners tend to develop understanding through collaboration and group work amongst their peers and instructors. The more social the environment is, the more receptive the learner will be to the lesson. Therefore, the research was based on Vygotsky's Social Constructivism [33] to examine if gender can influence the learners' knowledge and performance differently, specifically Saudi EFL students. Gamification increases communicative learning within students and pushes learners to use their collaborative skills to gain knowledge. Each learner's experience heavily impacts how they perceive and acquire the lesson, highlighting that students' various perceptions can influence the way they learn. Therefore, considering students' individual interests is an important approach that all teachers must follow if they want to develop a communicative and engaging learning experience. Gender and other external factors that distinguish one student from the other influence students' perception, involvement, and enjoyment of the lesson.

Using a survey as the main tool of data collection, the researchers were able to compare female and male students in regards to their perceptions of how Kahoot! affected four different variables, their motivation to learn, impact on teaching and learning, influence on affective characteristics, and the functionality of the design. The subjects showed no significant differences in any of these variables.

The findings of the current study showed no difference in perception of motivation between Saudi male and female EFL students involved in game-based learning, as the survey revealed very similar perceptions between male ($M = 4.41$) and female ($M = 4.32$) participants. Similarly, perceptions of the influence of Kahoot! on teaching and learning showed that males ($M = 4.33$) and females ($M = 4.36$) had no major difference between them, nor a major difference in regards to perceptions of the influence on affective characteristics (Males $M = 4.21$; Females $M = 4.23$) or perceptions on the influence on the functionality of the design of Kahoot! (Males $M = 4.10$; Females $M = 4.22$).

This result ties well with previous studies [12,17,18], wherein the argument lies heavily on the fact that there are no differences between genders in regard to perception and performance in gamification or digitized classrooms. Regardless of limited distinctions in in-game preferences between female and male students stated in earlier research (Khan et al. [15]), the overall comparison between genders does not indicate any major differences regarding student motivation, engagement, comprehension, or performance. The results lead to the conclusion that all students enjoy and benefit from the use of gamification in EFL classrooms.

6. Conclusion

The current study investigated gender differences in Saudi EFL students' perceptions and performances when using Kahoot! in the classroom. Previous research showed that implementing technologies, including digital games, increases students' involvement in the classroom [8,10–12]. Prior research claims that games like Kahoot! assist teachers in creating a positive and enjoyable learning experience for their students [2]. There exists a plethora of studies arguing that there is a gender-related difference between students' performance in game-based classrooms [15,16,30].

The findings of current research showed that motivation when using Kahoot! is not confined to one gender over the other but rather showed that both female and male students reacted similarly, and both exhibited a great interest in the game. Overall, these findings are consistent with research [2,12] showing that gender does not play a huge role in distinguishing between the implementation of gamification in EFL classrooms. Broadly translated, our findings indicate that integrating games like Kahoot!, is an effective tool for encouraging students' involvement and development within the classroom. The paper argues that instructors should implement gaming elements in their classrooms to generate positive student results, such as increased engagement and motivation to under content [2].

7. Limitations and future directions

It is important to note that for the purpose of the study, the participants were recruited from only two classrooms; therefore, the results of this study cannot necessarily be generalized to other contexts or even EFL classrooms as a whole. Future studies should aim to replicate results in larger and more diverse contexts. Additionally, female students had almost twice as many responses as their male counterparts, with 154 responses compared to a much smaller 79 responses.

Looking forward, further attempts could prove quite beneficial to the literature. The current study adopted a quantitative methodology; nonetheless, using a qualitative assessment to evaluate students' perception of gamification in the learning process would add value to the presented results. It is suggested that future researchers integrate the opinion and qualitative commentary of the sample because it will give an overall view of all the factors under study. Furthermore, future research should consider exploring other contexts to see how those could affect results. Similar to what has been done with gender, future research could certainly further test whether different age groups perceive Kahoot! differently as well. Additionally, different platforms such as Poll Everywhere, Seesaw, Aurasma, Quizizz, and Quizlet could be used in further studies that examine gamification. Future investigations are necessary to validate the kinds of conclusions that can be drawn from this study, especially validating the central claim on how the asserted remedial gamification approach could aid instructors in creating a positive, pleasurable, and attractive learning environment for students.

Disclosure statement

The author reported no potential conflict of interest.

Author contribution statement

Dr. Norah Almusharraf: Conceived and designed the experiments; Wrote the paper.

Ms. Dima AlSheikh; Ms. Maha Aljasser: Performed the experiments; Analyzed and interpreted the data; Wrote the paper.

Prof. Hala Dalbani: Conceived and designed the experiments; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Data availability statement

Data will be made available on request.

Declaration of interest's statement

The authors declare no competing interests.

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