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THE INFLUENCE OF PERCEIVED EASE OF USE, PERCEIVED USEFULNESS, SOCIAL INFLUENCE, AND PERCEIVED ENJOYMENT TOWARDS CONTINUANCE INTENTION IN USING A GAMIFIED E-QUIZ MOBILE APPLICATION

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ABSTRACT

Gamification has a huge influence on students' learning and is becoming a growing trend in education. Empirical evidence of recent studies proved the success of digital games in education, which has sought to validate the effects of gamification in support of its potential to improve academic performance. This paper aims to show the influence of perceived ease of use, perceived usefulness, social influence, and perceived enjoyment towards continuance intention in using a gamified e-quiz mobile application among Higher Education students. A total of 140 users registered as users of the technological product, named Kingdom Quizzes (KQ), covers the first-year students from the Diploma of Information Technology program. These students were randomly selected from one of the universities in southern Malaysia. Alpha Cronbach value for the reliability test indicated that perceived ease of use was 0.76, perceived usefulness was 0.818, social influence was 0.643, perceived enjoyment was 0.756, and continuance intention was 0.776. Pearson Correlation Analysis showed that there is a positive relationship between perceived ease of use (rs =.593** $p > 0.05$), perceived usefulness (rs =.694** $p > 0.05$), social influence (rs =.720** $p > 0.05$) and perceived enjoyment (rs =.700** $p > 0.05$) with continuance intention. Further analysis shows that social influence and perceived enjoyment influence the continuance intention using Kingdom Quizzes among the students, with a contribution of 59.8%. These findings indicated that effective gamification elements embedded in a mobile educational application and usage influence from the educators and peers exert highly significant strength towards retaining the students' interest in an educational product.

Keywords: gamification, Kingdom Quizzes, mobile learning, formative assessment

Introduction

Gamification is referred to as using game design elements within non-game contexts. The main idea is to take the 'building blocks of games and implement these in real-world situations, to motivate specific behaviors within the gamified situation (Deterding et al., 2011). Many studies have highlighted gamification as a promising concept applied within various contexts (Werbach & Hunter, 2012, Zichermann & Cunningham, 2011, Zichermann & Linder, 2013). Hunicke et al. (2004) and Mora et al. (2017) split gamified solutions into three elements as follows; (i) rules (mechanics), (ii) system (dynamics), and (iii) fun (aesthetics), which represent as the MDA framework. The MDA framework acts as a formal structuralist approach to understanding games to bring design, development, criticism, and technical game research closer. Gamification in education is an approach that proposes dynamics in association with game design within the educational environment to stimulate direct interaction with students, allowing them to significantly develop their social, curricular, and cognitive competencies (Alsawaier, 2018). It has been taken seriously as an educational approach that can facilitate learning, encourage motivation and engagement, improve learner participation and lesson interactivity, and stimulate learners to expand their knowledge (Göksün & Gürsoy, 2019). Through effective implementation, gamification can increase intrinsic motivation and engagement and serves as a strong tool for educators (Jurgelaitis et al., 2019; Kuo & Chuang, 2016). Hamari et al. (2016) stated that gamification offers an advantage. It makes learning fun through challenges, rewards, and friendly competitions, thus making it an attractive means to encourage students' engagement in learning. Moreover, it helps learners develop critical thinking and multi-tasking skills (Ding et al., 2018). Gamification in education incorporated several techniques or 'items' as external motivators to learners, such as points-scoring, leader boards, and awards of badges as rewards for completing levels of learning tasks (Goehle, 2013; Poondej & Lerdpornkulrat, 2016).

The application of game mechanics to non-game environments towards any tool or software is known as a gamification platform (Zainuddin et al., 2020). Many educational gamification studies have illustrated the integration of gamification, for example, the application of Web 2.0 tools which provide valuable functions for MOOCs in Udacity, Coursera, and edX (Chang & Wei, 2016; Aparicio et al., 2019), moodle platforms (Kyewski & Kramer, 2018; Ortiz-Rojas et al., 2019; Jurgelaitis et al., 2019; Huang & Hew, 2018; Huang et al., 2019; Barata et al., 2017; Lo & Hew, 2018), wiki platforms (Wikispaces.com; Özdener, 2018). Several studies have developed their gamification platforms to prioritize user-centric needs and help provide an impactful online experience for a diverse range of users. These platforms and applications aimed to promote students' learning performance and engagement (Sung & Hwang, 2013; Roslan et al., 2019; Kuo & Chuang, 2016), participation in online discussions using the gamified tool 'gEchoLu' (Ding et al., 2018; Ding, 2019) and their involvement in online post-lecture questions (Bouchrika et al., 2019). Meanwhile, several existing platforms and applications have been used in educational

gamification research, for instance, ClassDojo and ClassBadges (da Rocha Seixas et al., 2016), Ribbonhero of Microsoft (De-Marcos et al., 2016), Rain classroom (Ge, 2018), Quizbot (Garcia-Sanjuan et al., 2018), Duolingo (Rachels & Rockinson-Szapkiw, 2018), Kahoot and Quizizz (Baydas & Cicek, 2019; Göksün & Gürsoy, 2019), Math Widgets (Jagušt et al., 2018), Google + Communities (van Roy & Zaman, 2018), iSpring Learn LMS (Zainuddin, 2018) and Quizzes (Zainuddin et al., 2020; Kanah et al., 2021).

In education, assessment is a critical phase that supports teaching and learning success, used to monitor the students' learning progress mathematically (Pitoyo et al., 2019). Various types of assessments can be done depending on the academic task given to the students, such as individual assignments, group assignments, midterms, quizzes, and final examinations. Incorporating quizzes and games may encourage long-term retention of material (Vinney et al., 2016), motivate self and peer assessment (Nadeem & Falig, 2020; Raes et al., 2020) as well as increase students' interest (Lim & Md Yunus, 2021). Formative assessment based on multiple-choice questions (MCQs) can aid students with different learning styles and prepare them for high-stakes exams (Finig, 2013). Moreover, completing gamified MCQs allows the learners to practice summative assessments in an engaging and motivational approach (Douglas & Ennis, 2012). With vast selections of existing gamified e-quizzes platforms and applications, educators are left with an important decision to select the best tool that suits their students and the teaching and learning requirement. Often, an educational institution will come up with its educational products to accommodate the needs of its students, educators, academic administrators, and management (Troussas et al., 2020; Pechenkina et al., 2017; Zakaria et al., 2020).

Although user acceptance of the new technological product is a challenge, it is more strenuous to keep the existing users interested in using the accepted or adopted product for a long time. In 2008, Bhattacherjee et al. pointed out that the sustenance and success of a technology-enabled service are dependent on suppliers' or developers' ability to attract new users while retaining older ones. Hence, it becomes essential for a technological product to be evaluated from the users' perception. It will determine their intention towards its use which eventually affects the decision-makers on the necessity of maintenance and future upgrade of their 'in-house developed product. Research associated with continuance intention on product usage of e-learning (e.g., Lin, 2011; Chang, 2013; Muqtadiroh et al., 2019), massive open online course (MOOC) (e.g., Daneji et al., 2018; Dai et al., 2020), learning management system (LMS) (e.g., Cheng & Yuen, 2018; Ashrafi et al., 2020) and mobile learning application (e.g., Huang et al., 2014; Hu & Zhang, 2016; Tam et al., 2020) had been made. However, research on continuance intention specifically for a gamified e-quiz mobile application has not been explored much. Therefore, this study aims to investigate the factors related to an individual continuance intention to use a gamified e-quiz mobile application named Kingdom Quizzes (KQ), which are essential to any technology implementation, and to understand the reasons technologies discontinuance. Kingdom Quizzes is an android gamified e-quiz mobile application that incorporates a reward ranking system combined with a strategy game.

It was developed by one of the local universities in southern Malaysia, Universiti Tun Hussein Onn Malaysia (UTHM). Kingdom Quizzes applied the 'leaderboard' mechanism in the quiz module to encourage self and peer assessment and contribute 'virtual reward' to the players that can later be utilized in the next game module (strategy game).

A study by Premkumar and Bhattacherjee (2008) stated that perceived usefulness is the predictor of intention in the Technology Acceptance Model (TAM), and it is a reliable predictor of continuance intention compared to satisfaction in the combination of TAM with Expectation-Confirmation Theory (ECT). Bhattacherjee (2001) reported that an individual continuance usage happened when such use was perceived as valuable. Although in Kim & Nam's (2019) study involving factors influencing satisfaction and continuance intention of recommendation algorithms through structural equation modeling (SEM), perceived usefulness was found to have no significant direct effect on continuance intention in the newsgroup, a significant indirect effect was displayed via satisfaction. However, perceived ease of use in Kim & Nam's (2019) study appeared to impact continuance intention and perceived usefulness positively. Meanwhile, TAM also proved perceived ease of use improves users' continuance usage (Davis, 1989; Venkatesh et al., 2003). Other studies had also found perceived ease of use and perceived usefulness reflected by effort expectancy and performance expectancy, respectively, are amongst the drivers for continuance usage intention (Tam et al., 2020; Singh 2020; Daneji et al., 2018; Almazroa & Gulliver, 2018; Gefen et al., 2003). Tam et al. (2020) addressed two theoretical models, ECM and the extended unified theory of acceptance and use of technology (UTAUT2), in the quest to find the factors influencing continuance intention for mobile application. Meanwhile, Singh's (2020) study, similar to Tam et al. (2020), had also included perceived security and trust in the combination of ECM and UTAUT2. On the other hand, Daneji et al., (2018) research on the usage of PutraMOOC by students of University Putra Malaysia (UPM) had applied perceived ease of use, usefulness, and time spent as the investigating factors. Other studies are, Almazroa & Gulliver (2018), which was related to the continuance usage of Near Field Communication (NFC) m-payments, and lastly, Gefen et al., (2003) findings which revealed that experienced consumers intentions to transact with the last e-vendor from whom they purchased depends on trust, perceived usefulness and perceived ease of use.

While Cheng et al. (2020) agreed that perceived ease of use has a strong significance towards continuance intention to use Chinas' social media platform (Weibo), perceived usefulness impact, on the other hand, was insignificant. Their study also concluded that social influence impacts continuance intention positively and significantly. This agrees with the notion from previous studies implying that opinions and recommendations of those important and influential people will draw motivation to use the technological product (Kim, 2011; Cheng et al., 2020). Earlier research, such as Shen et al. (2011) and Zhou and Li (2014), proved that social influence affects the desire for continuance usage. Meanwhile, the research of Kim (2011) reported that users' continuance usage intention for social-networking services could be predicted by perceived usefulness and

enjoyment. This is based on the motivation theory mentioned in Deci (1971), which are the two main constructs of motivation, (i) intrinsic and (ii) extrinsic. Intrinsic motivation refers to the perceptions of pleasure or joy from performing a behavior, while extrinsic motivation refers to the performance of a goal-driven activity to achieve various rewards. Information system (IS) literature explained that extrinsic motivation is captured by perceived usefulness, whereas intrinsic motivation is captured by perceived enjoyment. Ashraf et al. (2020) investigated perceived usefulness, social influence (subjective norm) as well as perceived enjoyment which then revealed that the impact of perceived usefulness was far higher than perceived enjoyment and social influence on the students' continuance intention towards a Learning Management System (LMS). Based on the supported studies discussed, factors that will be investigated in this study comprise; (i) perceived ease of use, (ii) perceived usefulness, (iii) social influence, and (iv) perceived enjoyment.

Objective of the study

The study aimed to explore the influence of students' perceived ease of use, usefulness, enjoyment, and social influence on students' continuance intention in using a gamified e-quiz mobile application.

Literature review

To gain an ample understanding of this study's problem, a literature review of gamification elements based on the MDA framework (Mechanics, Dynamics and Aesthetic) and research constructs will be presented in this section. van Elderen and van der Stappen (2020) revealed an enormous potential impact in using gamification for improving the acceptance and continuance intention of technologies in education. They studied the gamification items representation of each of the MDA framework elements illustrated in Table 1 and later identified studies that relate the gamification items with technology acceptance constructs.

Table 1: Gamification Items Based on The MDA Framework Elements

Mechanics	Dynamics	Aesthetics/Emotions
Points	Increasing Task/Level & Mission	Avatars
Badges	Difficulty/Challenges & Quests	Personalized Image
Leaderboards	Social Games & Teamwork	Meaningful Stories
Performance Graphs/List		
Virtual Gifts & Items		

Based on that reference, we identified literature reviews associated with Kingdom Quizzes mobile application gamification items in Table 2. In table 2, each of this research independent variables,

Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Social Influence (SI), Perceived Enjoyment (PENJ), are aligned with literature reviews on gamification item of Mechanics (M), Dynamics (D) and Aesthetics (A) stated in aforementioned Table 1. Each independent research variable is further discussed, highlighting the relevance of the technological product, which is the Kingdom Quizzes application, and the gamification items embedded in the product.

Table 2: Relations between Kingdom Quizzes Gamification Items and Research Construct Based on Literature Reviews

	PU	PEOU	SI	PENJ
Points (M)	Attali & Arieli-Attali, (2015); Hamari (2013); Robson et al., (2016); Sailer et al., (2017)		Sjöblom et al., (2017)	Aparicio et al., (2012); Doherty et al., (2017); Mekler et al. (2017); Pappas, (2015); Przybylski et al., (2010); Robson et al., (2016)
Leaderboards (M)	Landers et al., (2017); Sailer et al., (2017); van Roy & Zaman, (2018)		Baabdullah, (2018); Depura & Garg (2012); Jia et al., (2017)	Burguillo, (2010); Landers et al., (2018); Pappas (2015); Ruhi, (2015); Song et al., (2013)
Virtual Gifts (M)	Domínguez et al., (2013).			Snyder & Hartig, (2013)
Performance List (M)	Cardador et al., (2017); Sailer et al., (2017); Ling et al., (2005).			Doherty et al., (2017)
Level, Challenges (D)	Dong et. al., (2012); Robson et al., (2016); Toda et al., (2018)	Landers et al., (2017)		Aparicio et al., (2012); Banfield & Wilkerson, (2014); Dong et. al., (2012); Li et al., (2012); Seaborn & Fels, (2015); Van Roy & Zaman (2018)
Personalized Image (A)	Annetta, (2010)		Annetta, (2010)	Annetta, (2010)

Perceived Usefulness (PU)

Perceived usefulness refers to the degree to which a person believes that using a particular system would enhance their job performance (Davis, 1989). Perceived usefulness in Kingdom Quizzes usage is defined as the belief of the students in the usefulness of the gamified e-quiz, Kingdom Quizzes to successfully function as an online quiz medium that can (i) display questions provided by the educators, (ii) capture the answer given by the students, (iii) review or compare the answers given with the actual answer set up by educators, (iii) calculate the scores for the corrected answer, (iv) displaying ranking on the leaderboard and (v) assigning the virtual gift/reward based on the ranking of the students. Many had pointed out the PU aspect related to gamification elements in educational technology products. For mechanics elements such as Points, Badges and Performance Graphs and Virtual Gifts, many studies revealed that rewarding and showing progress increases the expectancy of the learner on the educational applications' values (Attali & Arieli-Attali, 2015; Hamari, 2013; Cardador et al., (2017); Landers et al., 2017; Ling et al., 2005; Robson et al., 2016; Sailer et al., 2017). Points represent rewards for successful accomplishments of specific activities in the game, reflecting the player's progress (Attali & Arieli-Attali, 2015). Leaderboards, performance graphs, and badges positively affect task meaningfulness (Sailer et al., 2017).

Meanwhile, virtual gifts are significant due to their influence in making players feel that they are performing well (Domínguez et al., 2013). Mechanics elements with items such as performance graph or list provide a continuous and direct feedback mechanism that links directly to PU (Attali & Arieli-Attali, 2015; Cardador et al., 2017; Sailer et al., 2017), and this visualization of competence development, managed in enhancing the feeling of value (Hamari, 2013) and the task meaningfulness (Sailer et al., 2017). Furthermore, Dynamics and Aesthetics elements also have a potential impact on PU. For example, the interaction between students can achieve cross-learning and affect the PU of a game (Toda et al., 2018), such as demonstrated by Dong et al. (2012, which proved that gamified puzzle helps the participants to learn how to use computer software, and the experience was evaluated to be effective, fun, unique and engaging. Meanwhile, Robson et al. (2016) reported that new levels, tasks, or players are needed to inspire continuously. Lastly, personalized images or avatar offers the players freedom of choice and autonomy and increase decision freedom and task meaningfulness (Annetta, 2010).

Perceived Ease of Use (PEOU)

Venkatesh et al. (2003) defined perceived ease of use (PEOU) as the degree of ease associated with the help of the system. PEOU, in this study, investigates higher education institution students' ease of use during their Kingdom Quizzes usage. For instance, users do not have any problem understanding how to use the product, and the terms used in the product are easy to understand. The button's position and process of executing quizzes using Kingdom Quizzes can work quickly and smoothly. This also refers to ease related to interaction with the product and the degree of ease

in learning to use the product. There are literature reviews of PEOU for mechanics element through item social games and teamwork and the aesthetics element for item meaningful stories. However, those items or features are not present in the technological product of this study (Kingdom Quizzes). Hence, only the dynamics element through the level, mission, challenges, and quests by Landers et al. (2017) is listed in Table 2. Landers (2017) discovered that goal setting is generally for simple tasks because it is easier for a person to see the connection between the effort and the goals achieved.

Perceived Enjoyment (PENJ)

Perceived enjoyment (PENJ) is a fundamental intrinsic motivation that specifies the extent to which fun can be derived from using IT or an IS (Chao, 2019). In this study, perceived enjoyment refers to how fun can be derived from using the Kingdom Quizzes application and providing an enjoyable experience. Several studies have indicated that enjoyment is a potent predictor of usage decisions for technologies such as the telephone (O'Keefe & Sulanowski, 1995), online shopping (Childers et al., 2001), websites (Van der Heijden, 2003), Facebook (Quan-Haase & Young, 2010; Praveena, 2018), mass media (Nabi & Krcmar, 2004; Ledbetter et al., 2016), Sina Weibo (Wang et al., 2016), social networking sites (Chuang et al., 2017) and mobile video call (Zhou & Feng, 2017). As the technological product, Kingdom Quizzes contains a strategy game embedded in it and incorporates gamification elements for the whole product (quiz module and game module). Hence this study included the PENJ factor to investigate the leisure context. Nowadays, many mobile applications incorporate gamification and games as an added value to grab the users' interest and eventually retention (Roslan et al., 2021; Areed et al., 2021; Roslan et al., 2018). In recent years, the construct PENJ has been added to most research models, especially for a gamification-based or game-based product. It is the most crucial determinant of mobile games adoption (Lee & Quan, 2013; Nysveen et al., 2005). Another reason is based on the notion that enjoyment and fun experience can increase learning motivation (Zirawaga et al., 2017), hence motivating the educational products' usage.

Most educational studies relate PENJ construct with the gamification items Points and Leaderboards. Interactivity and feedback positively impact PENJ (Hsu & Lu, 2004; Lin et al., 2012; Wang & Wang, 2008). Meanwhile, Pappas (2015) discovered from a survey that 89% of the students stated that the point system would increase their engagement. However, several studies propose conditions before gamification elements can positively affect PENJ. For example, Aparicio et al. (2012) found that positive effects only occur when mechanics elements are presented in a non-controlling and voluntary setting. Points only increase intrinsic motivation when the reward is the outcome of an achievement (Doherty et al., 2017).

On the other hand, Mekler et al. (2017) found that in a controlled experiment, points and badges did not affect intrinsic motivation significantly. Meanwhile, element Levels, Missions, Challenges,

and Quests are closely related to the motivational aspect of mastery, and several studies stated that increasing the task difficulty does increase engagement and enjoyment (Banfield & Wilkerson, 2014; Li et al., 2012; Seaborn and Fels, 2015). However, not all potential impact is positive. For example, van Roy and Zaman (2018) found challenges to only be effective for those students who we already motivated to do well from the very start.

Social Influence (SI)

Venkatesh et al. (2003) stated that social influence is how an individual perceives that important people such as relatives, peers, and subordinates believe that they should use the new system. Social influence defined the users' decision to use the gamified e-quiz mobile application, Kingdom Quizzes if they believe that the people who are important to them are already using it or will support them in using it. These important people are; (i) educator/lecturer, (ii) colleagues/peers, (iii) parents/family members and (iv) organization/institution. When facing new situations, people often seek suggestions and consultation from others to reduce potential uncertainty and anxiety (Karahanna et al., 1999). This means that their decisions are affected via word-of-mouth from those people around them. Studies from Shen et al. (2011), Zhou and Li (2014), Cheng et al. (2020), and Vanduhe et al. (2020) reported that social influence impacts continuance intention positively and significantly. This agrees with the notion from previous studies implying that opinions and recommendations of those important and influential people will draw motivation to use the technological product (Kim, 2011; Cheng et al., 2020).

Social gaming affects experiences of social relatedness (Molinillo et al., 2018). For example, students can 'play' in groups and conveniently share their results and high scores on (external) social networking platforms (Baabdullah, 2018). Social gamification elements can trigger the feeling of being 'left out' (van Roy & Zaman, 2018). Mechanics elements also have a potential impact on social influence. For example, individuals are more likely to engage in behaviors that they presume engaged by others as well (Sjöblom et al., 2017), which can further be triggered through leaderboards and badges. Players are 'ranked' according to their relative success, measured against chosen success criteria. As it shows which of the players performs best, it encouraged competitiveness. This competition can positively influence the people at the top of the list but can negatively affect the players at the bottom of the list (Jia et al., 2017). Landers (2017) stated that positive effects are triggered if the 'competitors' have approximately the same level. Aesthetics elements can also have an impact on social influence. A meaningful shared goal can foster experiences of social relatedness (Sailer et al., 2017). In cooperative games, avatars or personalized images can help become part of a community (Annetta, 2010).

Methodology

This study implemented a correlational, cross-sectional research design to predict factors influencing continuance intention in using gamified e-quiz mobile application among higher education institution students, represented by the first-year students from the Diploma of Information Technology program, CeDS, UTHM. This study collected data among 140 students at one specific point conducted at the end of their study semester. These students are already registered users of the technological product named Kingdom Quizzes. The students used Kingdom Quizzes for one semester as their online learning. Data was gathered using an online questionnaire (Google Form) which appears to be the most appropriate way to collect data for this study amid the pandemic Covid19. The quizzes were executed using their own mobile devices starting from the 2nd week of the semester and mostly performed outside of the campus environment due to the Movement Control Order (MCO). In the 12th week of the semester, the students were given the Google Form link for the questionnaire in which they were required to fill in during the virtual class session using Google Meet.

For the study, the researchers developed an instrument to collect the data. The questions were divided into two sections: Section A: Demography and Section B: Close Ended Questions. There are five variables in this study: four independent variables (perceived usefulness, perceived ease of use, perceived enjoyment, and social influence) and a dependent variable (continuance intention). Eight items of perceived ease of use construct were adapted from Davis (1989), Sánches and Huerous (2010), and Venkatesh et al. (2012). Meanwhile, eight items were used to measure the perceived usefulness construct adapted from Davis(1989), Sánchez and Hueros (2010), Bhattacherjee (2001), and Venkatesh et al. (2012). The next factor, social influences, consists of seven items adapted from Venkatesh et al., (2003, 2012) scales. The last element, perceived enjoyment, has six items, adapted from Thong et al. (2006) and Venkatesh et al. (2012) scales. Lastly, continuance intention, which will assess students voluntarily pursuing or continuing using Kingdom Quizzes, has seven items adapted from Bhattacherjee (2001) and Roca et al. (2006) scales.

All the dependent and independent variables were reliable instruments in measuring all the variables studied based on the Alpha Cronbach analysis. Values for the reliability test resulted as follows, perceived ease of use (0.76,) perceived usefulness (0.818), social influence (0.643), perceived enjoyment (0.756), and lastly, continuance intention (0.776). SPSS Statistics software was used in the analysis process, which involved all the 140 pieces of data or feedbacks received. The responses were free from missing or invalid data. The instrument was carefully prepared using the Google Form, which enforced the validation (compulsory input restriction) and selection from a drop-down list (scale) to avoid 'garbage' input data. Analyses done were based on descriptive analysis (mean and standard deviation) for all the variables involved, inferential statistics

(Pearson's correlation) to find relationships between all independent variables towards the dependent variable, regression and also multiple regression to find the level of contribution of all independent variable as predictors for continuance usage intention for Kingdom Quizzes application.

Findings

The analysis of the study will begin with the descriptive analysis for all variables studied (refer to Table 3). The overall mean for the perceived usefulness using Kingdom Quizzes is 3.88 (SD = .504) shows that students have a positive perception that using Kingdom Quizzes would improve their academic task performance. The mean value of Kingdom Quizzes is 4.02 (SD = .584) for perceived ease of use, which is considered very high. This indicated that the students did not face any problems using Kingdom Quizzes, and they felt that it was easy to use. Meanwhile, the mean value for social influences using Kingdom Quizzes is 3.70 (SD = .503), showing that their peers and lecturers persuaded them to use Kingdom Quizzes during their study period. For perceived enjoyment using Kingdom Quizzes, the mean value is 4.40 (SD = .654). The mean value is very high, which indicates the students' perception that participating in Kingdom Quizzes is fun. Overall, the mean for continuance intention using Kingdom Quizzes is 3.72 (SD = .540), exhibiting that the respondents have the intention to continue using Kingdom Quizzes in the future.

Table 3: Mean and Standard Deviation for Variables Studied

Variable	Mean	Standard Deviation
Perceived Usefulness	3.88	.504
Perceived Ease of Use	4.02	.584
Perceived Enjoyment	4.40	.654
Social Influence	3.70	.503
Continuance Intention	3.72	.540

The next analysis will determine the relationships between the four factors with continuance factor studied and continuance intention using Kingdom Quizzes. There was a positive correlation between perceived ease of use ($r = .593$; $p < .001$), perceived usefulness ($r = .694$; $p < .001$), social influence ($r = .720$, $p < .001$) and perceived enjoyment ($r = .700$; $p < .001$) with students' continuance intention using Kingdom Quizzes.

Table 4: Correlation Coefficients Between Perceived Ease of Use, Perceived Usefulness, Social Influence and Perceived Enjoyment Towards Students' Continuance Intention Using Kingdom Quizzes

	Perceived Ease of Use	Perceived Usefulness	Social Influence	Perceived Enjoyment
Continuance Intention	.593**	.694**	.720**	.700**

** Correlation is significant at the 0.01 level (2-tailed)

Afterward, a regression analysis was also conducted to test the study objective and identify the different factors influencing the students' intention to use Kingdom Quizzes. Table 5 shows the multiple correlation coefficients was 0.610, indicating approximately 61% of the variance of the students' continuance intention using Kingdom Quizzes accounted for by perceived ease of use, perceived usefulness, perceived enjoyment, and social influence.

Table 5: Model Summary

Model	R	R Square	Adjusted R Square
1	.781	.610	.598

a Predictors: (Constant), Enjoyment, Ease of use, Social influence, Usefulness

Table 6 indicated the influencing factors were statistically significant at 0.05 level of significance (F (4,139) = 52.76, p = .000). This showed that any factor listed could significantly predict the continuance intention using Kingdom Quizzes.

Table 6: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig
Regression	34.77	4	8.693	52.76	.000
Residual	22.24	135	.165		
Total	57.01	139			

a Dependent Variable: Continuance Intention
b Predictors: (Constant), Enjoyment, Ease of use, Social influence, Usefulness

As Table 7 illustrates, the results of the multiple regression analysis indicated social influence and perceived enjoyment influenced students' continuance intention in using Kingdom Quizzes. The relative order of preference of the predictive factors of students' continuance intention using Kingdom Quizzes was based on beta values (β) which are summarized as follows: social influence (β = .351), and perceived enjoyment (β = .319). In other words, social influence contributed 35.1% of the variance, and perceived enjoyment explained 31.9% in students' continuance intention using Kingdom Quizzes.

Table 7: Model Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig
	B	Std. Error	Beta		
Constant	.237	.292		-.809	.420
Perceived Ease of Use	.101	.098	.079	1.022	.308
Perceived Usefulness	.137	.111	.125	1.233	.220
Social Influence	.344	.091	.351	3.774	.000
Perceived Enjoyment	.407	.108	.319	3.793	.000

a Dependent Variable: Continuance Intention

Discussion

The results showed that users' continuance usage intention towards a gamified e-quiz mobile application is predicted by social influence and perceived enjoyment with beta values (β) 0.351 and 0.319, respectively. Although all four factors studied appeared to have positive relationships towards continuance intention, significance values in Table 7 confirmed that two out of the four factors were more than 0.05. Thus, only social influence and perceived enjoyment (p= .000) were defined as the predictors. In contrast to previous research (Tam et al., 2020; Singh 2020; Daneji et al., 2018; Almazroa & Gulliver, 2018; Gefen et al., 2003), which gave high regards on perceived usefulness and perceived ease of use factors towards influencing the continuance intention of a technological product. Aside from acquiring the information regarding relationship and level of contribution of predictors, the means of each factor were also analyzed, resulting in perceived enjoyment having the highest mean of 4.40 (SD=.654), followed by perceived ease of use (mean=4.02, SD= .0584), perceived usefulness with the mean value of 3.88 (SD= .504), continuance intention mean value of 3.72 (SD= .540) and lastly, social influence mean value of 3.7 (SD= .503). The respondents, in general, have a high level of agreement on all factors. At the same time, the standard deviation (SD) values represent the estimation of the scatter of values around the sample was close and not spread out away from the mean. Also, from the descriptive analysis, the student's intention to continue using Kingdom Quizzes was highly positive (mean= 3.72, SD= .540).

The strengths of those positive relationships between perceived ease of use, perceived usefulness, social influence, and perceived enjoyment with continuance intention were analyzed based on the rule of thumb Guilford & Fruchter (1973). The result of r for perceived ease of use (r = .593; p < .001) indicated moderate relationship with continuance intention. Meanwhile, perceived usefulness (r = .694; p < .001) also showed a moderate relationship. However, social influence and perceived enjoyment showed high relationships with continuance intention based on r= .720 and r = .700, respectively. The findings in this research highlighted perceived enjoyment as a strong factor based on having the highest mean value, high relationship towards continuance intention. They contributed 31.9% as a predictor for Kingdom Quizzes usage continuance intention. Meanwhile, social influence accounted for 35.1% of the variance, the highest contributor. These factors explained a considerable 61% variance of continuous intention to use Kingdom Quizzes.

The result revealed that an individuals' intention to continue using a gamified e-quiz mobile application is affected by the variables of perceived enjoyment and social influence. However, when comparing the results of this study with those of previous continuance intention studies, it differs in terms of perceived usefulness and ease of use being significant predictors for continuance intention of a technological product. Firstly, to explain the inconsistency result of perceived usefulness and perceived ease of use, it may be because the second-semester students already have

experienced other educational platforms (e-Learning) such as LMS, MOOC, and mobile applications products (M-learning) in their first semester of study, which means that they are already used to those products performing significant academic tasks successfully with ease, hence it has become somewhat of a norm for them, that a product will manage to fulfill its purpose effortlessly. Secondly, to explain the reason of perceived enjoyment appealed more in this study's finding, using an educational gamified mobile application product seemed to offer the students a new experience, perspective, and expectation. A gamified mobile application considers the theory of gamification in educational settings to provide content in an attractive mode to gain a higher level of attention from learners.

Contrary to the conventional educational product, for instance, mobile application or learning management system (LMS) that do not incorporate any gamification elements, the gamified mobile application was initially constructed to entice and motivate learners to perform academic tasks wherever they are. Thirdly, regarding the highest contributed factor for continuance intention, which is the social influence (35.1%), this result indicated that gamified e-quiz mobile application users were managed to be coerced, persuaded, and pressured into using the educational product whether from their circle of friends, family, peers, educator or even the institution itself. The feeling of being influenced will naturally affect their behavior. This notion has also been approved in previous research, such as in Lee's (2010) and Chen et al.'s (2012) studies.

Conclusion

Based on the results of this study, factors perceived enjoyment and social influence were proven to have strong influences toward continuance usage intention. This indicated that creating fun, interactive, and engaging educational content in a mobile application that helps connect educators, students, and their peers, is a helpful activity for users' continuance intention. The gamification items that correspond to these significant predictors also indicate that the utilization also had a significant effect. This shows that the construction of attractive and engaging gamification items will secure the effectiveness of the gamification-based, educational technological product. This should be taken rather seriously by the education institutions' management as it also determines the future direction of the painstakingly developed product, which should also be a worthy investment in the quest to populate their institutions' online learning resources. It can be summarized that constructing educational content through gamification techniques would be an impetus to students' continuance intention (Hassan et al., 2019; Shi et al., 2019). Therefore, the developers or researchers should produce a tool improvement plan document based on the findings for restructuring or upgrading the products' gamification items accordingly. This will act as a clear guideline for the technical team in conducting the product maintenance and as a reference document for the stakeholders in making decisions.

Although this study offers some insightful contributions, it suffered from limitations that must be addressed in future studies. Due to performing cross-sectional research, there is a lack of complete understanding of the dynamics among individuals' perceptions. Hence, it is recommended that such research take a longitudinal perspective into account, enabling researchers better to grasp the dynamics of the constructs over time. Next, the sample studied in this research was limited to one single program in one university (Diploma of IT program from UTHM), which did not consider other programs or institutions. It may seem to exist biases in this study in terms of the selection of sample or respondents due to the background of Diploma of IT students already being IT literate, as aforementioned, all the students are required to use the institutions' e-learning and m-learning resources related to their studies since their first semester, meaning that if this research was to be performed on students from other programs, the level of IT literacy or experiences will still be the same. However, suppose the study was to be conducted on the first semester of the first-year students. In that case, it is recommended to include respondents from other programs as well, so that comparison could be made between students from different programs, resulting in an in-depth analysis. Further research is needed to support the generalizability of the findings in this study by considering larger populations from several programs and universities. Lastly, the observed 39% portion of the unexplained variance indicates that other factors beyond the scope of this study could improve explanations of gamified e-quiz mobile application continuous usage intention whether as direct contributors or that serves as mediators, for instance, trust, satisfaction, or confirmation of expectation.

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