

Systematic Review: Students' Perceptions of the Use of Gamification

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Abstract

In the current era of globalization, the use of gamification is an important element in learning. Generation Z students are exposed to the use of digital technology-based learning that focuses on the gamification approach. This survey research was conducted to look at the gaps in learning methods to survey students' perception of the use of gamification in learning. The methodology section of the research used the PRISMA (Preferred Reporting Items for Systematic Review and Meta-Analyses) approach. The article search period is from 2016 to 2022. A total of 29 articles selected from five databases EBSCO Host, Scopus, ProQuest, Web of Science (WoS), and Google Scholar have been thoroughly analyzed and synthesized. The selected articles were reviewed using qualitative, quantitative approaches, and mixed methods. Findings from this research prove that the use of the gamification method has a positive impact on students in terms of effectiveness, motivation, and overall engagement. The suggestions for further research can discuss students' attitudes and challenges towards the use of gamification. The results from the findings showed that students' attitudes towards the use of gamification were somewhat reduced. Challenges in implementing of gamification approach in learning are also poorly discussed. This survey contributes to the field of education by looking at students' perceptions of the use of gamification as well as providing guidelines to other researchers to identify other issues that require further study.

Keywords: A Systematic Review of Gamification, Student Perception, Game-Based Learning, Effectiveness, Motivation, Engagement

Introduction

In the current era of globalization, the Malaysian education system has gone through a transformation of its curriculum and delivery techniques based on the use of Information Communications and Technology (ICT). The widespread use of the internet in the era of the fourth industrial revolution is expected to be a driver in every aspect of daily life. ICT has the potential to increase access to education and the suitability of educational quality. The function of ICT is becoming more widespread in terms of systems and forms of equipment for today. The use of technology helps students understand and maintains the concept of

learning well. Society uses ICT to meet individual needs and wills such as processing information, transferring information, storing information, and disseminating information.

In line with the educational gamification system is referred to as one of the methods of teachers conducting game-focused activities to encourage students to actively participate in the learning process (Zin et al., 2021). Although gamification does not fully meet the game elements, the concept of digital games is also applied to students in an effort to form students' attitudes and awareness toward game-based learning. Gamification is a game produced to facilitate the teaching and learning process (Rugu et al., 2020). The Delima Portal plays a role as an online learning platform containing gamification elements created by MOE to assist teaching and learning sessions. Gamification in learning is not just a game but also used as a teaching design that helps the student's interior in the classroom. The use of gamification can be modified according to the level of achievement of students inclusively and exclusively and not only the aspect of promoting student motivation only (Rugu et al., 2020).

The student's perception of gamification affects external and internal factors. External factors such as device convenience, internet access, and curriculum policies as well as internal factors such as interest, attitude, awareness, and effectiveness towards game-based learning. The research of Tan & Tasir (2022) stated that most third-year students showed a positive perception of the Plickers application with a gamification approach. The research conducted by Yen & Mustafa (2020) argues that the gamification method in learning Mandarin as a foreign language affects the student's attitude in a positive way. Next, the results of the research by Ali et al (2021) showed that gamification in complex number topics attracts interest, motivation and increases the student's achievement score compared to traditional methods. The findings from the studies reviewed bring about the need for researchers to identify the factors that shape students' perceptions. Therefore, a systematic survey was conducted to identify students' perceptions of the use of gamification in the teaching and learning process.

Systematic Literature Review (SLR)

The systematic literature review is an important literature review in the field of academic research. Through literature, review analysis can understand the breadth and depth as well as identify the gaps to be explored (Xiao & Watson, 2017). It is a more systematic research approach in following clear methodological methods in detailing the procedures used, the overall scope includes all relevant criteria (Okoli, 2015).

Based on the research explored found two statements of research problems in improving students' positive perception of the use of gamification. The student's level of mastery of gamification is still at an early stage. Students will face difficulties when they are unable to solve the problem given due to not being able to connect the concepts taught by the teacher (Alias et al., 2021). If, the student cannot connect with real-life it means the student is not able to solve the problems that arise on the issue being studied. The chalk and talk approach is known as the traditional approach as it only practices the use of whiteboards and markers when delivering lessons (Seuk et al., 2020).

The willingness of educators in implementing the gamification approach is somewhat reduced. The lack of teachers' skills and knowledge of ICT knowledge causes students to explore ICT applications to a limited extent. The failure of teachers to apply technology based on technical preparation brings problems to low student achievement (Shanmugam & Balakrishnan, 2019). Educators need to take into account the elements of PAK21 such as critical thinking, creativity, communication, and collaboration so that students can master the PAK21 skills. The lack of digital resources and limited internet access are obstacles to educators. After conducting the analysis of the research found that the student's perceptions of the use of gamification are still scattered. The following are the objectives of the research for the problem statement to be studied:

- Survey students' perception of the effectiveness of gamification.
- Survey students' motivation towards the use of gamification.
- Survey students' engagement towards the use of gamification.

This research was analyzed by three research questions namely:

- Does gamification affect students' perception of the effectiveness of gamification.
- Does gamification motivate students in learning?
- Does gamification affect students' perception of engagement in learning?

Methodology

This systematic review research uses the literature review method as a research design. The literature review is a domain feature in academic research. The strength of the literature methodology is understanding the breadth, and depth of body available as well as knowing the gaps to be explored (Xiao & Watson, 2017). Researchers can test hypotheses specifically or can construct new theories by summarizing, analyzing, and synthesizing a group of literature relating to the purpose of the research (Xiao & Watson, 2017).

Implementation Phase

This systematic review was selected to view, analyze, evaluate and synthesize empirical research related to students' perception of the use of gamification. The researcher used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to ensure that the research met the criteria of systematic review (Moher et al., 2009). This section of the methodology includes four phases, namely the identification phase, the filtration phase, the qualification phase, and the admission phase.

Identification Phase

The first phase is the identification phase through five databases namely EBSCO Host, Scopus, Google Scholar, ProQuest, and Web of Science (WoS) in search of articles related to students' perceptions of the use of gamification. While carrying out the process of searching for articles, setting the correct and accurate keywords can make it easier for the researcher to reach the articles related to the title of this research. Next, the researcher used a series of keywords that had perceptions, learners, and gamification. The combination of keywords will be done after creating the pilot study. The article searches are continued through the Boolean method after the keyword sequence is identified as below:

(student's OR learners OR "pelajar") AND (perception OR perspectives OR view OR "persepsi") AND (gamification OR gamified OR "gamifikasi")

Filtration Phase

This phase requires the researcher to set the desired criteria to be included and excluded from the literature review. Criteria for a systematic review to meet the objectives of the research. The criteria used can be referred using the table below.

Table 1

Included and excluded criteria

Process	Setting limit	Included	Excluded
Criteria	Year	<ul style="list-style-type: none"> • 2016-2022 	<ul style="list-style-type: none"> • Articles before 2016
	Language	<ul style="list-style-type: none"> • Malay and English 	<ul style="list-style-type: none"> • Articles from other languages
	Types of research	<ul style="list-style-type: none"> • Empirical research 	<ul style="list-style-type: none"> • Non-empirical research
	Types of publishing	<ul style="list-style-type: none"> • Full-text articles • Articles related to topics • Full access articles • Journal articles 	<ul style="list-style-type: none"> • Insufficient article context • Articles that have nothing to do with the topics • Articles are not full access • Books, proceedings, websites, and other publications

As a result of the article search, there were 2906 articles that have been identified consisting of 2566 articles from Google Scholar, 64 articles from Scopus, 46 articles from Web of Science, 20 articles from ProQuest, and 210 articles from EBSCO Host. Through this phase, 2625 articles have been issued for not meeting the established criteria.

Qualification Phase

In the qualification phase, the article is accepted on the basis of studies that characterized and explored students' perceptions of the use of gamification. Acceptance of study was based on the articles that have full text. Participants consisted of school students, college students, undergraduate students, graduate students, and postgraduate students. The year of publication of the article was between 2016 and 2022. In addition, the researcher accepted articles written in English and Malay according to the database explored. The researcher also ensures that the researches have clear abstracts and methodologies, research findings that meet the aspects of validity and reliability.

Admission Phase

The researcher has identified a total of 29 articles upon completion of the screening process. Based on eligibility criteria, a total of 29 articles were removed from 281 articles after assessing the quality and suitability of the research. Therefore, a research sample (n=29) was

included to carry out a systematic review. The selection of articles is shown on the PRISMA flowchart in figure 1 below.

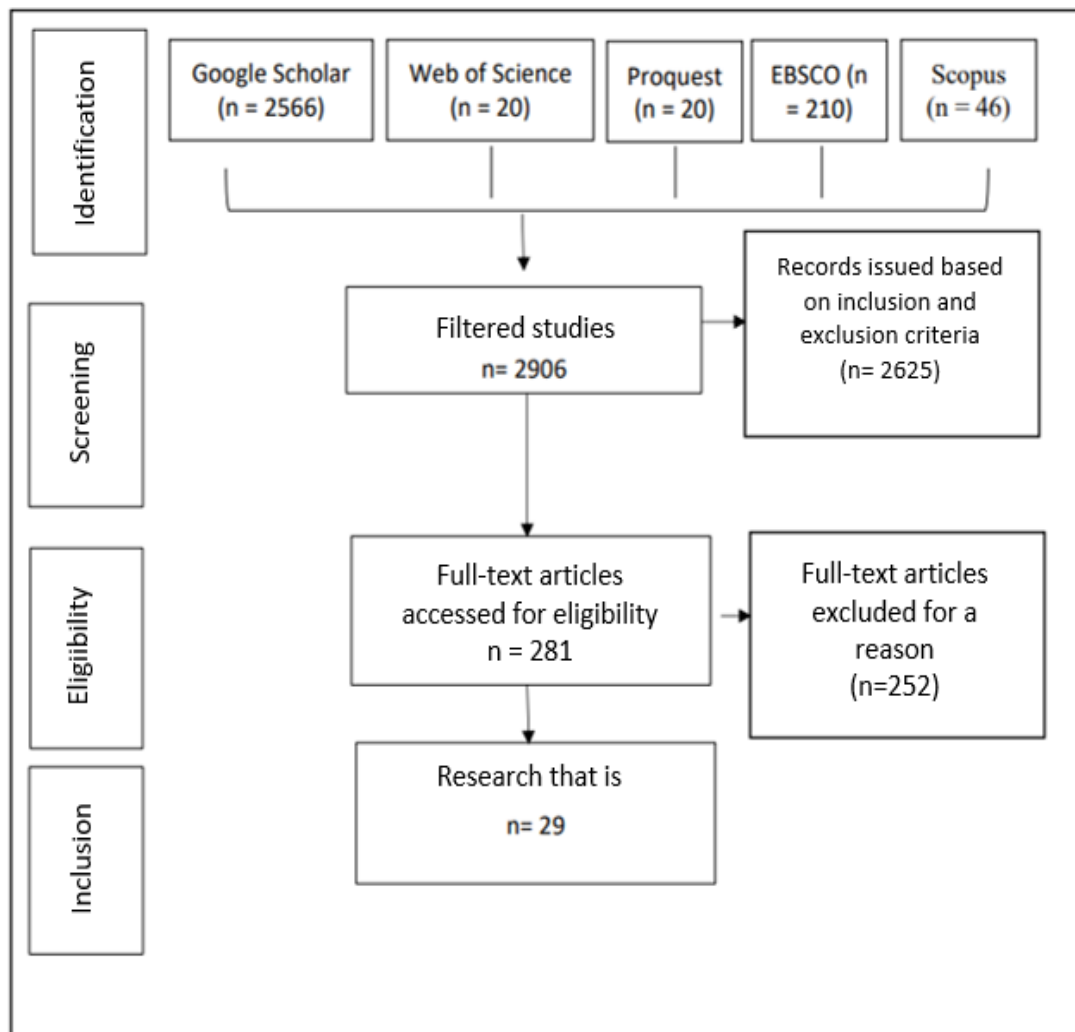


Figure 1: PRISMA flow chart of the journal article search process (Source adapted from PRISMA flow chart (Moher et al., 2009))

Eligibility number and Research Sample

Table 2

Research Sample

Eligibility Number	Researcher	Research sample
E1	Ahmed & Asiksoy (2021)	70 first-semester engineering students
E2	Alabbasi (2017)	47 graduate students
E3	Alawadhi et al (2021)	122 Emirati undergraduate students
E4	Ali et al (2021)	60 students in the engineering mathematics courses
E5	Azar et al (2020)	63 university trainees
E6	Bicen et al (2018)	65 undergraduate students Preschool education
E7	Buckley et al (2016)	13 students for group 1 27 students for group 2 Undergraduate students Post-graduate students
E8	Buckley & Doyle (2017)	Undergraduate students
E9	Campillo-Ferrer et al (2020)	101 undergraduate students
E10	Chans et al (2021)	48 engineering students
E11	Chapman et al (2018)	124 undergraduate students
E12	Cruz & Guayara (2021)	19 secondary school students
E13	Fithriani (2021)	74 general English university students
E14	Gulinna & Lee (2020)	235 college students
E15	Hartt et al (2020)	2 lecturers 60 students
E16	Ismail et al (2020)	64 second-semester students (Diploma of Information Technology)
E17	Kwon et al (2021)	62 undergraduate students
E18	Matlan et al (2021)	53 technical students
E19	Mei & Yang (2019)	87 University students
E20	Mohamad et al (2020)	91 distance learning graduates (master in English as a second language)
E21	Pratama (2020)	35 upper secondary school students
E22	Rahmahani (2020)	153 secondary school students
E23	Tan & Tasir (2022)	30 year 3 primary school students
E24	Yen et al (2020)	56 students with a diploma in accounting and diploma in business studies
E25	Yildirim (2017)	34 second-semester students of primary school mathematics
E26	Yildiz et al (2021)	Sixth-fifth grade students
E27	Zaharin et al (2021)	60 form 2 secondary school students
E28	Zou (2020)	277 primary school students 8 teachers
E29	Alawadhi et al (2021)	122 Emirati undergraduate students

Research Findings

This section will discuss the articles synthesized according to the title of the research constructed. Research design, research location, and analysis of data collection from empirical research will be discussed in the research findings.

Table 3

Analysis of findings from previous studies

Eligibility number	Gamification elements	Research design / research instrument	Finding
E1	-Leader boards	Design-based research -Questionnaire (5 - point Likert scale)	Correlation data do not hinder students' motivation in gamification. This element can be true if students collaborate with peers in real-time comparative information throughout the course, such as with live data leaderboards.
E2	-	Descriptive analysis -online questionnaire (9 -point Likert scale) -semi-structured interviews	Able to build peer interaction and able to share ideas. There are significant differences in the way extroverts and introverts interact with game-based teaching techniques and achieve fun
E3	-Reward system	-	The reward system influences gamification through competition and rewards.
E4	-Educational games (EG)	A pilot study (Unstructured observations, student diaries, semi-structured interviews)	Students found the educational games (EG) method to be very effective in conveying information. The EG method allows students to learn without the guidance of teachers and also focuses on conceptual learning as well as increasing student motivation due to fun games.
E5	-PLLEX	A pilot study (online questionnaires, interviews, and focus groups)	This study shows that students from different majors can see the fun in learning differently. This method affects the attitude of college students toward pleasure in collaboration. There are students from other fields who are less favored working together in a learning environment.
E6	-Scoring system -Badges	Q methodology (combination of quantitative and qualitative)	Students have positive thoughts and attitudes towards the research conducted. The point system and badges are important elements but cannot expect the expected results.

E7	-Combination of EE and AR	Mixed method Field notes, online questionnaires, semi-structured interviews	Positive perception of student experience but not willing to collaborate with peers. The combination of environmental education (EE) and augmented reality (AR) can enhance the learning experience, development of environmental awareness, and reflective thinking skills of students.
E8	- Kahoot -Reward system	Mixed method -questionnaire (5 - point Likert scale) -Group interviews	Kahoot gamification learning can increase students' interest and have a positive effect on student motivation
E9	-CFL -Leaderboard -Badge -Score	-Questionnaire -Semi-structured interview form -Pre-test	The findings also indicate that some students (7%) face technical challenges. -Discussion shows the effect of Classical Flipped Learning (CFL) that improves students' innovation skills. The results showed that the CFL method has a positive effect on students' innovation skills. Findings of interviews with students revealed positive perceptions of gamification by revealing important aspects throughout the CFL process.
E10	-Bethe 1 Challenge	Qualitative interviews pre and post-tests	- The Bethe 1 Challenge is a fun as well as encouraging application to learn English. This is evident in the SG teacher dashboard as it reports that only 42.4% of 10 th graders can create an institutional account and 15.1% of them need to register with a free user account. Bethe 1 Challenge found that students showed good encouragement, participation, and motivation in learning.
E11	-Leadership board -Points -Badges	Review -questionnaire (5 - point Likert scale)	86% of graduate students believe the integration of leaderboards in the learning management system makes them more competitive, hard-working, and successful. Increase students' sense of belonging and increase interaction. Students noted that there was an element of the game contributing to an increase in the level of online learning engagement. Engage

			online education educators to use strategies preferred by students.
E12	-Ranking system	Qualitative -Group interview	Students love a ranking system that fosters extrinsic competition. Students enjoy learning. Most students are motivated by rewarding gifts in the form of money. Gamification is effective in large groups. The nature of motivation is more emphasized by men. A competitive form of learning interventions to ensure that motivation is not lacking due to competition. The negative perception of not having an effective communicator of information.
E13	-Kahoot	Quantitative Questionnaire	Team mode in Kahoot encourages collaboration in discussions and has a positive influence. Kahoot increases student motivation as well as student performance grades. The questionnaire data shows the need for school involvement in technical factors. Kahoot affects cognitive aspects as well as non-cognitive aspects such as perception, attitude, experience, and effectiveness.
E14	-Quizizz -Leader boards	Quantitative Questionnaire (5 - point Likert scale)	The use of Quizizz provides positive reinforcement, motivation, and instant feedback. Quizizz creates an energetic and fun learning environment for students of all ages, regardless of ICT skills. Quizizz creates opportunities to imitate answers among others. However, mixing up the questions in the quiz can avoid this challenge.
E15	-MALL	Quantitative Online questionnaire (5 -point Likert scale)	The majority of students showed a positive attitude toward ICT technology (Mobile-assisted Language Learning, Gamification, and Virtual Reality) in teaching English virtually to students during the pandemic. A fun learning environment creates feelings between students in terms of engagement.
E16	-Kahoot -Leadership board	Mixed method -online questionnaire	GSRS(Kahoot) has the potential to maintain students' attention, improve engagement in classrooms, increase

		(5 -point Likert scale) -semi-structured interview	motivation, and create a pleasant learning experience in English lectures but Kahoot is not a measurement tool for improving academic performance.
E17	-Quizlet	Quantitative Pre-test Post-test Questionnaire (5 - point Likert scale)	Quizlet creates a fun learning environment. EFL students stated that Quizlet can motivate them for having competition while using and practicing vocabulary.
E18	-Quizizz	Quantitative Descriptive analysis -online questionnaire (5 - point Likert scale)	The use of Quizizz in mathematics T&L received positive feedback specifically in improving students' motivation in learning mathematics. Attracts interest and motivation of students. Students disagree that Quizizz improves their understanding of a learning topic.
E19	-Snake and Ladder	Quantitative Descriptive Analysis (5-point Likert scale-questionnaire)	The use of Snake and Ladder attracts interest and increases students' motivation in reviewing the lesson.
E20	-	Quantitative	Ending notes with the use of motivational words can increase student motivation. The results showed that students' perceptions of the topic of complex numbers were at a high level. Pre- and post-test results increase after the use of gamification materials. Students' perceptions can show positive feedback on the use of gamification.
E21	-Workbook	Quantitative Security Basics and IT Professional pre-test (DFT4013) DFT4013 post-test Questionnaire (5 - point Likert scale)	The use of workbooks helps students understand and review each topic more systematically and quickly in the T&L process for the DFT4013 course at JTMK, PMJ. The gamification method attracts students' interest in understanding the content of the topic of the lesson.
E22	-Plickers -Points system -Leadership board	Quantitative Pre-test Post-test Questionnaire (5 - point Likert scale)	The overall findings of the questionnaire show that the student's motivational level is at a high level. Interview data proved the Plickers app attracts the attention of students. The results of the interviews showed that

			the use of Plickers had a positive effect on student motivation, achievement, and perception.
E23	-	Quantitative -questionnaire	-Questionnaire data showed that students were interested and excited about Mandarin language classes. Students show a positive and fun attitude towards gamification in learning Mandarin.
E24	-Flipped Classroom -Edpuzzle	Observations, interviews, observation logs, meeting minutes Self-reflection	Students find flipped classroom gamification fun and can face the challenges of learning difficulties in English. Edpuzzle's data shows task completion at a high rate. Gamification methods are effective in driving motivation, confidence, student communication, and self-control of learning skills.
E25	-Wordwall -Tickets -Token	Quantitative -Questionnaire -Pre-test -Post-test	Pre and post-test data showed students received achievements in the gamification approach through assignment scores, ticket acceptance through tokens, and bonuses to turn on the camera throughout the process. Students can work collaboratively with peers when opening the camera. Students' engagement is more when using gamification.
E26	-Kahoot	Quantitative -Pre-test -Post-test -Questionnaire (Likert 5 points)	Based on the results of pre and post-tests the integration of the student response system in Kahoot improves students' perception of social sciences, increases active engagement as well as motivates students towards interactive learning.
E27	-	Quantitative -Descriptive analysis -Questionnaire (5 - point Likert scale)	-Students show a high interest in learning perimeter and area topics. -Lead towards an active learning style. Students' perception in the aspect of acceptance and interest in gamification in the learning perimeter and area topics are high. In addition, cultivating students' thinking skills and soft skills are nurtured.
E28	-Kahoot	Quantitative	Findings show learning English using Kahoot is fun. The implementation of Kahoot increases the level of student

		-Questionnaire (12 open-ended questions and 3 closed-ended questions) -5-point Likert scale	motivation. The findings also showed that students only show interest and were active. Kahoot can motivate students to be actively engaged in encouraging interaction in the classroom as well as having a positive impact on the knowledge and skills they achieve.
E29	-Reward system	Questionnaire (5 - point Likert scale)	Team reward systems reduce social competition and lead to low intrinsic motivation. Findings show that gamification assessment is not robust enough in providing a positive knowledge of the content. The negative impact was higher on the course experience than on students' satisfaction due to the use of the reward system.

Publication Period

Based on the year of publication, it can be seen that in 2020 more articles have been published. In 2020, 11 articles were published, and followed by 2021, 1 article was published representing the mixed method. Followed in 2021, a total of 10 articles were published. Next in 2019, 1 article was published while in 2018, only 2 articles were published. However, 2017 represented 3 articles, and 2016 represented only 1 article according to the research's publication period.

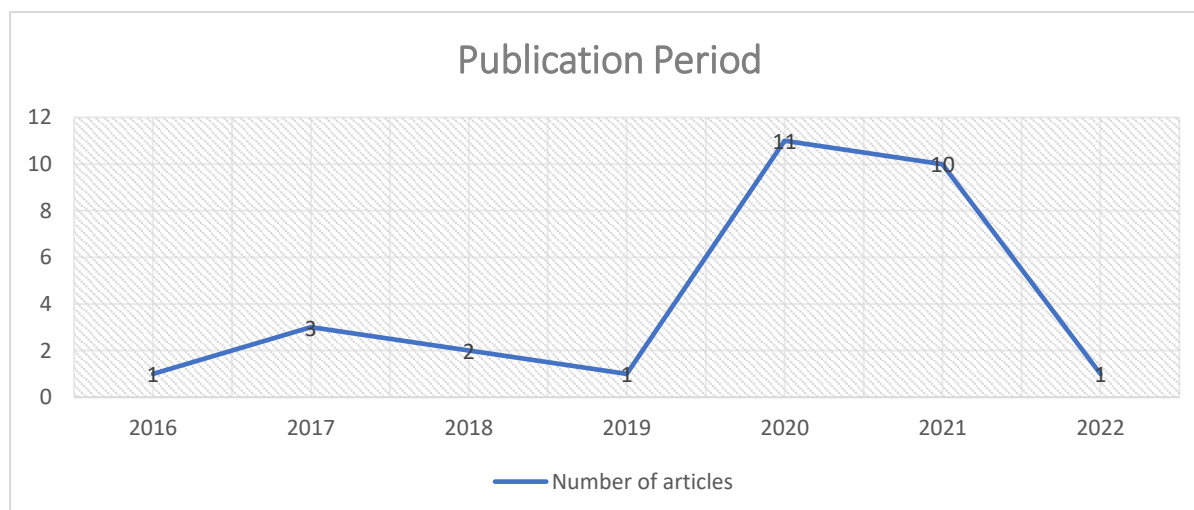


Figure 2: Number of published articles

Research Location

The participants in the reviewed articles were represented from various countries around the world and the research sample was filtered according to the selected database as well as prioritizing adequate context. The gamification approach is widely used and is most popular in the current technological era. A total of (n=9) articles were selected from Malaysia at a

large number meanwhile, a total of (n=4) articles were selected from Turkey. While Indonesia has as many as (n=3) and Ireland as many (n=2) articles. Finally, Canada, China, Columbia, Saudi Arabia, the United Arab Emirates (UAE), Hong Kong, Mexico, and Spain represented only (n=1) each country.

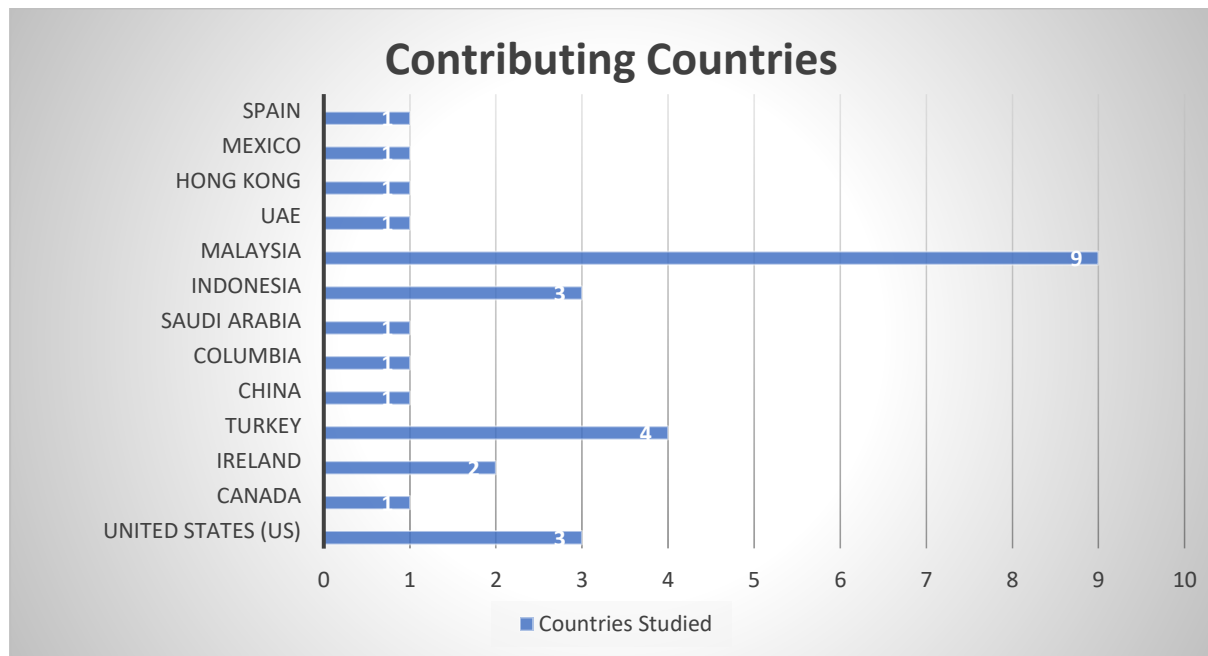


Figure 3: Countries contributing to the literature review

Discussion

This section will discuss articles that affect students' perception from three aspects, namely effectiveness, motivation, and engagement. The articles contributing to these three aspects are shown in Figure 4.

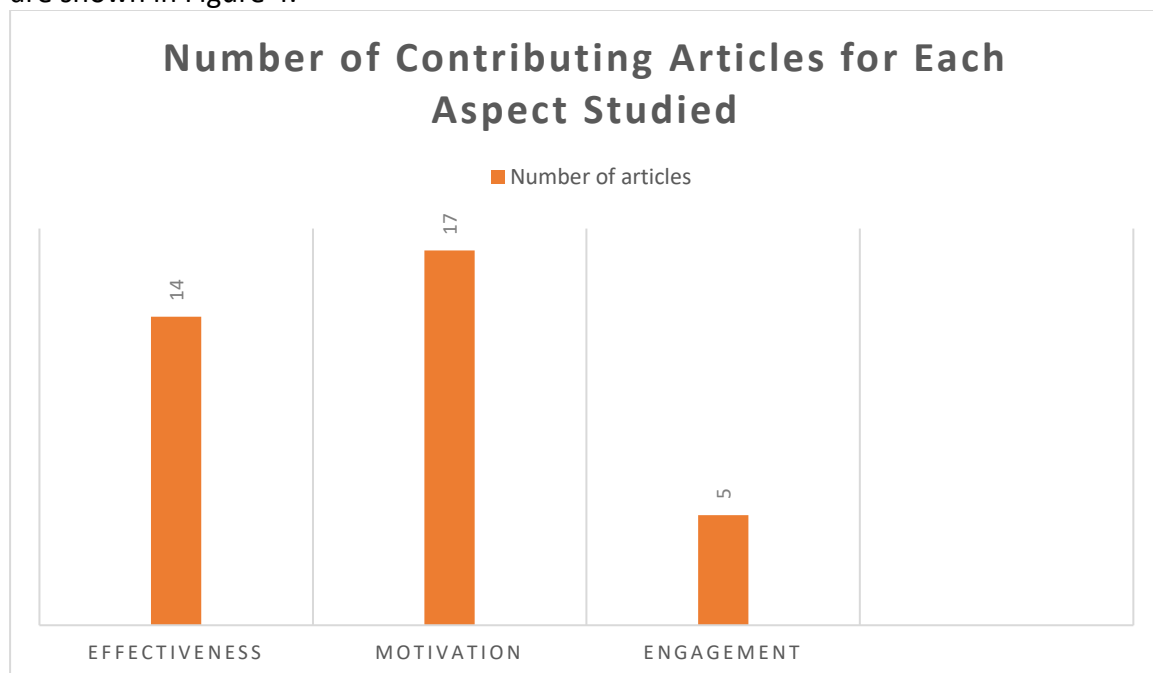


Figure 4: Number of contributing articles for each aspect to be reviewed

Research Question 1: Does Gamification Affect Students' Perception of Learning Effectiveness?

A total of 12 articles discussed students' perceptions of the effectiveness of gamification in learning. After looking at the findings from 12 articles it can be seen that the gamification approach has a positive effect on the effectiveness of learning. Gamification can encourage interaction between peers (Hartt et al., 2020; Yen et al., 2020), create a sense of belonging in games (Alabbasi, 2017), enhances collaboration, and creates active interaction (Yen et al., 2020). Qualitative findings from the research of Yildiz & Şimşek (2021) demonstrate that the method of educational games (EG) allows students to continue learning without any teacher guidance. The game elements incorporated into the gamification platform help students in determining their progress towards learning (Alabbasi, 2017). This research also shows that the combination of game elements can enhance the cognitive effect in terms of improving memory, focus and making students more efficient in building skills.

In addition, gamification is effective in group play (Buckley & Doyle, 2017), team mode in the Kahoot application promotes collaboration in discussions as well as having a positive perception of students (Rahmahani, 2020; Yen et al., 2020). Gamification not only enhances the effectiveness of the cognitive aspects only but also creates a fun learning environment (Fithriani, 2021) and teaching (Hartt et al., 2020). The gamification element is able to strengthen the learning of English. Interview findings from Cruz & Guayara (2021) research prove that the Bethe1 Challenge improves the reading aspect, students' grammar skills, and Fithriani research, (2021) supports the above statement that the use of Quizlet elements is effective for students in learning vocabulary in English. The observational findings of Zou (2020) research show that the use of gamification through Edpuzzle allows students to complete tasks quickly and encourages students to actively engage.

Research Question 2: Does Gamification Motivate Students in Learning?

Students' perceptions of the use of gamification can be seen from the motivational aspect. Motivation is an important aspect of encouraging students to continue learning. Gamification motivates students through competition (Buckley & Doyle, 2017; Bicen, 2018; Fithriani, 2021). Reward systems (Buckley & Doyle, 2017; Bicen, 2018) in the game element affects the students' motivation. Not only that, ending notes with the use of motivational words, color and audio combinations increases student motivation (Ali et al., 2021). Based on case study of Licorish et al (2018) Kahoot motivate students to get involved, encourage active interaction in classroom, allows students focus on their learning and maintains long-term memory. Research conducted by researchers Yildiz & Simsek (2021) found the EG method increases students' motivation through fun games. Research by Chan & Lo (2022) found that a total of 94.2% of students found that the Kahoot application motivated students in the classroom, as well as the intrinsic nature of visuals and color, allows students to be competitive with peers. These findings are supported by the research of Bicen (2018); Rahmahani (2020); Campillo-Ferrer & Miralles-Martinez (2020); Pratama (2020) that the Kahoot application increases students' motivation in problem-solving toward learning.

According to Matlan & Matt (2021) the Quizizz application motivates students in the subject of Mathematics. While the Plickers application can attract the topic of third-year remuneration, as well as the interview findings, prove that students do not feel bored during the learning sessions (Tan & Tasir, 2022). Results from the pre-and post-test findings of the Chans & Castro (2021) research showed assignment scores, ticket acceptance, tokens, and

gamification element bonuses led to high achievement in Wordwall games. The interview findings of Ahmed & Asiksoy (2021) clarifies gaming elements through Classical Flipped Learning (CFL) increase motivation as well as support students learning. Students are comfortable using leaderboards and encourage positive reinforcement (Mohamad et al., 2020), as well as gamification methods, and are more motivated than traditional methods (Chapman & Rich, 2018). The interview findings of Cruz & Guayara (2021) stated that gamification is able to motivate students through the Bethe1 Challenge and the qualitative findings of Alawadhi & Abu-Ayyash (2021) study found that students understand the content as well as maintain extrinsic motivation through the gamification method. The research of Buckley & Doyle (2016) stated the ranking system fosters extrinsic competition and students can learn with fun. In general, the use of gamification through the implementation of game elements can increase the motivation and active competition of students.

Research Question 3: Does Gamification Affect Students' Perception of Involvement in Learning?

The use of gamification elements allows students to remember and understand the lessons taught as well as to maintain the student's focus on the teaching session (Ali et al., 2021). The research of Mei & Yang (2019) found that the combination of environmental education (EE) and augmented reality (AR) is beneficial in language learning and environmental knowledge. The researcher also found students can enjoy learning in the absence of technological disruption. The combination of EE and AR develops students' environmental awareness, and reflective thinking skills. Students have a positive perception of the learning experience but are not willing to go through the process in collaboration with peers. A fun environment actively engages students as well as enhances collaborative skills (Alawadhi & Abu_Ayyash, 2021; Azar & Tan, 2020). The qualitative data of Azar's & Tan (2020) research increase engagement through the stimulation of discussion and peers.

The Chans & Castro (2021) research found that the gamification approach encourages extensive student engagement. In addition, students majoring in chemistry found gamification easier to relate to the content of chemistry lessons, and non-chemistry students found gamification more interesting and showed positive interest and attitude in learning. Based on questionnaire workbook through gamification could help students understand the theory and remember the important terms for each topic studied (Ismail & Nor, 2020). The quantitative findings of the Pratama (2020) research state that the application of Kahoot leads to fun learning in English subjects. Thus, the use of gamification has a positive impact on student engagement and is one of the reasons students accept this platform.

Other Aspects that Affect the Use of Gamification

Gulinna & Lee (2020) research stated the gamification method affects the positive attitudes of students in the field of business education and the STEM field towards fun and collaboration. However, students in the field of Social Sciences & Behavior were not comfortable with collaboration in a learning environment. Whereas, Azar & Tan (2020) research stated that the majority of students showed a positive attitude towards the MAG and AR methods. The use of virtual reality (VR) exposes students to simulations of reality that can be manipulated to meet their needs of the students. Moreover, Yildirim's (2017) research proves that gamification brings thinking and students in a positive direction however, one

should not expect good results through the implementation of scoring and badge system elements.

Aspects of interest are also discussed in the two selected articles. Matlan & Maat (2021) research stated the Quizizz application is very interesting and interactive to increase students' understanding and students' do not experience difficulties in accessing and being proficient in using this application. Abdullah's & Abdul Razak's (2021) research showed a high interpretation of the measurement of students' interest in learning Sirah Islamic Education and participating in discussing elements of gamification can stimulate students' motivation in learning Sirah. Research in line with the Zaharin et al (2021) research showed high interest for students in learning perimeter and area topics for form two subjects and led towards an active learning style.

Students' Perception of the Challenges of Gamification Implementation

Gamification is one of the popular intervention methods that bring effectiveness to teaching and learning. However, it poses some challenges in effectively implementing learning. Sabornido et al (2022) research revealed their findings according to four things, namely incomplete student involvement, not completing the assigned tasks, impaired performance, and problems arising in student attitudes. Buckley & Doyle (2016) research argued that the gamification approach is not suitable if the student is interested in the traditional method as there are times when the gamification application does not provide the correct and valid answer. Educators also need to reflect so that the interventions developed do not result in the motivation of students through competition. This research is consistent with Kwon & Ozpolat (2021) research who stated the experimental group showed a positive effect on the use of textbooks. They also found that students' knowledge decreases in gamification assessments.

Furthermore, gamification assessment is not robust enough in providing a positive effect on pedagogical knowledge. The reward system creates a negative impact on motivation, social competition, and teamwork. Next, technical factors (Rahmahani, 2020) and the absence of gadgets, and poor internet access (Matlan & Maat, 2021) result in a non-fun learning environment. Rahmahani's (2020) research questionnaire data shows that the issue of technical factors needs to be addressed by the school. The production of uninteresting quiz design causes students to quickly get bored. The statement is in line with the findings of the research (Matlan & Maat, 2021) that most students do not agree to bring the Quizizz application to improve their understanding of a learning topic effectively.

Recommendations for Further Research

Based on the 29 articles that have been reviewed there are some recommendations in the student's perception of the use of gamification. Initially, the gamification approach can be carried out according to the degree of suitability of the student. This is so, in a classroom a student consists of various levels of mastery. Gamification can be implemented as a classroom assessment method so as to reduce students' anxiety over the assessment carried out. Teachers can use gamification strategies to reduce test anxiety by using the application of gamification as an assessment instrument (Pitoyo, 2019). Assessment through gamification should be carried out transparently and explained to students through the assessment rubric for each of the given criteria. This proposal aims to produce a task that is given to achieve the

learning objectives as well as to produce quality.

In addition, the use of gamification elements in project-based learning (PBL) in primary school is a second recommendation. The research on the students' perception using gamification elements on primary school students is somewhat limited. The main goal of gamification is to motivate students in by practicing skills, rewarding, and systematically recognizing that will contribute to student actions to the implementation of the project (Souza, 2019). This is so, the reward system in gamification affects the student's responsibility to produce a project full of interest. This PBL assignment can be carried out individually or in groups. Among the advantages of PBL assignments is that students can help students who are at a weak level. The PBL method not only benefits an individual but also benefits group members to earn rewards for completed projects.

Conclusion

Based on the suitability of the technological boom, the use of gamification in learning is indispensable for future generations. The result of a systematic review of students' perception of the use of gamification found that students' acceptance of the use of gamification is good. It not only affects the effectiveness of learning but also increases the motivation and involvement of students and answers the research questions constructed. Other aspects such as students' attitudes and interests have also improved. In this regard, there are still aspects that need to be improved such as internet access, teaching methods, and digital support resources. It needs to be refined in order to optimally run the learning process. The use of gamification is highly encouraged in academics so that it is self-beneficial while moving to the next level.

The trend of this approach also indicates an imbalance in the selection of correct gamification elements. The research studied focuses more on the aspects of effectiveness and motivation. There are countries that do not discuss the effectiveness of gamification based on the theory of learning. This research also presents some recommendations for further studies. The first recommendation can be a lot of gamification teaching methods in primary school so as to avoid traditional methodical practices. Next, it requires a systematic review of students' perception of the dominant gamification elements that play a role in improving academic performance and reducing cognitive load in learning.

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