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Systematic Literature Review on Fun Learning Towards Students' Development

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Abstract

The determination of presenting this paper is to illustrate a method of conducting a Systematic Literature Review (SLR) on the psychology education field. Fun learning, which also represented as edutainment, specified as an educational method that merges entertaining and intriguing activities to enhance the learning progression. Through the attractive learning ambience, students are capable of capturing added values for education. In sequence, playful learning is pertinent to generate learners' positive attitudes. The systematic literature review offers a summary of the fun learning influence against the development of students' behavior. For the requirement, 25 selected articles between 2018 and 2023 were analyzed to focus on the key characteristics of this research matter. The major findings of this study display three main themes of emotional, behavioral, and cognitive engagements. It shows the accommodation of fun learning approaches made a construction process in students' behavior.

Keywords: Fun Learning, Edutainment, Positive Attitudes, Students' Development, Students' Behavior

Introduction

The Ministry of Education Malaysia (MOE) has taken actions to intensify the enforcement of the curriculum in schools through the utilization of an entertaining learning approach. This refinement process had led to the construction of a diversified engaging teaching method with the entertainment elements such as singing, storytelling, acting, and poetry (Ministry of Education Malaysia, 2013). The learning ambience within the classroom has become highly captivating for the students specifically. For this reason, the process of transferring knowledge to the students has transited towards a more interactive and relaxed approach (Jamian et al., 2016).

The significant comparison observation of traditional education systems with presently learning is through the students' involvement during teaching session. In former times,

students' engagement during the educational process was limited and absence of motivational manner factor upon students. This situation resulted in inadequate academic performance among pupils. The rise of amusing and compelling educational approaches in the current educational period is a notion that affords a sense of enjoyment and enchants students' concentration. This leads to stimulate their self-esteem to construct good attitudes. As we can see, it demonstrates the innovative learning strategy while having joy has successfully created an effective learning environment (Razimi, 2016; Yusri, 2017; Tan & Ruhizan, 2022). Pupils will become more enthusiastic and self-reliant in learning.

From another perspective, every teaching effort in the educational system demands a balanced priority on constructing good personality in pupils. The quality character of a student embraces their identity, attitudes, and behaviors exemplified in manifold components for instance ethics, integrity, interpersonal culture, self-discipline, and self-awareness. In order to establish a good character in a student, the developmental process requires a range of time which is manipulated by interactions and experiences in an encouraging atmosphere. The outcome will exhibit how the students interact or communicate towards surroundings in either a positive or negative behavior.

Concerning this matter, an enjoyment educational method with involvement of multiple interesting actions, such singing-based edutainment activities can help students easily adapt the values of positive character program comprehensively. Reney (2016) explained the use of short song lyrics with basic language which suits the students' understanding will gain their attention and encourage them to sing while learning. In separate case, gamification is convinced to contribute formation of good attitude in pupils. Gamification is visible as another level of fun learning mechanism which suits to engage the millennial generations (Jain & Dutta, 2019). Furthermore, Othman and M. Jamil (2023) emphasized the game-based learning approach is important to be practiced as added value initiative towards balance academic achievement and personality development. This circumstance will help students learn to recognize their self-potential, headed for positive attitude changes.

As we can see, a multitude of the studies have been focussed on how the fun education mechanism influenced students' attention towards the learning understanding outcomes. There was a gap for the uniqueness in edutainment against the development of students' behavior. By using SLR approach, it offers a precise procedure that intensively discovers and synthesizes applicable studies to discover the findings of students' behavior development from enjoyment learning methods. Those SLR reviewed findings are the combination data taken from qualitative, quantitative, and mixed method articles. Additionally, SLR proposes organized, understandable, and replicable workings at every single step in the discovery process (Higgins et al., 2011). This SLR process will determine the progression review is guided by the main research question; 'How the fun learning influences students' behavior development' respectively.

Methodology

Review Protocol-PRISMA 2020

This presentable and informative study was guided by PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) 2020 review protocol. PRISMA is a compilation of protocol which was formed to enhance the transparency and reporting of systematic reviews and meta-analyses in research or study. The authors as systematic reviewers are accountable to develop a transparent, complete, and accurate report for every single process. This is

significantly to ensure the systematic review identified valuable findings. The PRISMA 2020 statement offers revised reporting guidance for systematic reviews which reflects advances in method for identifying, selecting, appraising, and synthesizing the mean of selected studies. The arrangement and demonstration of the components have been well-customized to facilitate implementation (Page et al., 2021). Through guidance of PRISMA 2020, the Systematic Literature Review process began by identifying and generating research questions using the PICo method. The "PICo" is the short form of 'P' represents for Problem or Population, 'I' stands for Interest and 'Co' is meaning by context.

Subsequently, the strategy to search relevant studies was carried out through the three systematic stages of identification, screening, and eligibility. A quality appraisal process was then conducted based on the adapted criteria proposed by (Hong et al., 2018). At this state, the quality and validity of every chosen article was decided before those articles were integrated into the reviewing process. Afterwards, the qualified articles were handled within accordingly phases of data extraction and data analysis. The data extraction course was conducted by the main research question. On the other hand, the qualitative data synthesis named by thematic synthesis either inductive or deductive, was proceeded to examine the extracted data. These help the authors to assure the guidance met the purpose of the review.

Formulations of Research Question

In this study, the research question is generated through the objective to be served as navigation to the systematic literature review. In developing the research question, the mnemonic of PICo was utilized, which performs 'P' (Problem or Population), 'I' (Interest) and 'Co' (context) (Lockwood et al., 2015). Based on these approaches, the authors made three main elements as part of the review, students (Population), fun learning environment (Interest) and students' attitudes (context). This step permitted the authors to set up the main research question of this study: how far the effectiveness of fun learning can be implied towards the construction of students' attitudes.

Systematic Searching Strategies

Shaffril et al (2018) proposed the involvement for three phases of identification process, screening process and eligibility process as the systematic searching methods. These stages made reviewers able to acquire relevant and qualified articles. Plus, the three phases were appointed to ensure the conduct with an accurate investigation (Figure 1) to address the review's objective. At the same path, the authors were able to fully locate and synthesize the selected studies in a well-organized and transparent SLR process.

Identification

The identification process is the initial phase from the systematic searching strategies. The identification process is performed by determining the relevant and suitable keywords to be implemented in the search process. In line with Durach et al (2017), the most adequate combination of searching term to be used selected is after considering the inclusion or exclusion criteria of the review's research question. This action is to ensure the seeking process will include every single significant research and will exclude insignificant studies. Furthermore, it is appropriate to apply more than one or two databases to avoid retrieval bias (Durach et al., 2017). This searching procedure relied on these three main keywords of fun learning, behavior, and school student. By guidance of the formulated research question, the purpose of this SLR is to discover how far the influence of fun learning towards the

development of students' behavior. For that case, the fundamental role of Boolean operator OR or AND or AND NOT has been used in the searching process. The authors utilized the functions of field code, phrase searching, wildcards, and truncation as the additional effort which can be seen in Table 1.

The achieved articles were analyzed from the three main indexing databases in the scientific community: Scopus, Science Direct and ERIC (Education Resources Information Center). ERIC database was selected for the function of facilitates studies related to education research. Each article found from these three databases has been attentively reviewed farther its research's title and abstract. This is a vital process in order to choose the relevant articles related to the SLR objectives. As been through, the attempted searching process retrieved 857 potential related articles from the three chosen databases.

Table 1
Search string used in the selected database.

Database	String
Scopus	TITLE-ABS-KEY ((“fun* learning" OR "fun* education" OR "gamification" OR "educational game*" OR "game* based learning”) AND (“behaviour" OR "attitude*" OR "manner*" OR "character*”) AND (“school student*" OR "pupil*" OR "learner*”))
Science Direct	((“fun* learning" OR "fun* education" OR "gamification" OR "educational game*" OR "game* based learning”) AND (“behaviour" OR "attitude*" OR "manner*" OR "character*”) AND (“school student*" OR "pupil*" OR "learner*”))
ERIC	title: “fun learning"; abstract: “students' behaviour"

Screening

The screening process is functioning to verify relevant and sufficient articles from the first processed articles according to SLR basement with a specific set of criteria. Kitchenham and Charters (2007) mentioned each criterion can be chosen by the authors for the review on the condition of directly followed the research question basement and capable to interpret and classify research articles correctly. By referring to the 'research field maturity' principle mentioned by Kraus et al. (2020) the chosen articles were selected from the published articles within the time frame starting 2018 until 2023. This timeline was chosen because it is sufficient to demonstrate qualified information as to be written based on the topic. At same time, additional criteria of the articles are imported as empirical research papers since the provision of primary data formation. The selected list was not a thesis or dissertation report, review papers or any form of a newsletter. This is shown in Table 2.

Table 2
Inclusion and exclusion criteria

Criterion	Inclusion	Exclusion
Timeline	2018-2023	2017 and earlier
Document types	Articles (with empirical data)	Review article, book chapter, book, proceeding of conference etc.
Language	English	Non-English
Subject area	Education, social sciences, psychology, environmental science, health professions, arts, and humanities	Medical, neuroscience, economics, computer science, business, management, accounting, biological sciences, biochemistry, nursing

As been through the process, this study's SLR objective is related to fun learning, behavior, and school students. By including those fields of education, social sciences, psychology, nursing, environmental science, health professions, & arts and humanities as criteria for the subject area were able to increase the probability of receiving related articles. Those selected articles were able to well-define the research question of the study. Linares-Espinos et al. (2018) proposed the understanding of reviewed articles can be limited to English written language to evade the disarray interpretation and able to minimize the time-consuming process. For that reason, this SLR method only chose English language articles from the list. After discarding the articles which failed to meet the mentioned criteria, 152 articles were preserved. Those selected articles were reduced to 124 articles based on the screening process and proceed for the next stage of selection.

Eligibility

The third phase is the eligibility process of the systematic searching strategy. During this process, the 124 selected articles were re-examined to determine the fulfillment of selection criteria. Durach et al (2017) proposed the importance of looking further at the studies' title and abstract while assessing the significance of every single article regarding the scoping review. The authors implemented in-depth examination for the residual studies to figure out whether the studies met predetermined inclusion criteria. This can be seen through reviewing the title, abstract, or the entire studies. There were 25 articles eliminated during the first screening for their titles. Then, 40 articles were excluded after the evaluation process for the studies' abstracts. Another 34 articles were removed after a detailed process of reading the content of the articles. For the summary calculation, 99 articles were terminated at this stage. This is because those articles did not focus on the fun learning influence towards the development of students' behavior. Finally, 25 articles were selected according to the systematic literature review.

Quality Appraisal

In order to verify the recommended studies, in terms of fulfilled methodology and analysis, the quality appraisal stage is carried out. Along with this, the authors applied the Mixed-Method Appraisal Tool (MMAT) which was designed by (Hong et al., 2018). The MMAT' concept allows researchers to examine the preferred studies in a systematic mixed studies

review, comprising qualitative research, randomized controlled trials research, non-randomized research, quantitative descriptive research, and mixed methods research (Hong et al., 2018). The quality of the approval articles was appraised by using five essential criteria which were recognized in the research design. Five co-authors supported the corresponding author in the evaluation of methodological and analytical rigor of designated articles.

MMAT is being functioned to examine the selected articles accordingly, for example the consistency between the sampling implemented in every study and the analysis form conducted (non-random sampling vs confounders) (Table 3).

Table 3
The assessment criteria used to determine the rigor of the methodology and analysis used in the selected articles

Research design	Assessment criteria
Qualitative	QA1: Is the qualitative approach appropriate to answer the research question? QA2: Are the qualitative data collection methods adequate to address the research question? QA3: Are the findings adequately derived from the data? QA4: Is the interpretation of results sufficiently substantiated by data? QA5: Is there coherence between qualitative data sources, collection, analysis and interpretation?
Quantitative (descriptive)	QA1: Is the sampling strategy relevant to address the research question? QA2: Is the sample representative of the target population? QA3: Are the measurements appropriate? QA4: Is the risk of nonresponse bias low? QA5: Is the statistical analysis appropriate to answer the research question?
Quantitative (non-randomized)	QA1: Are the participants' representative of the target population? QA2: Are measurements appropriate regarding both the outcome and intervention (or exposure)? QA3: Are there complete outcome data? QA4: Are the confounders accounted for in the design and analysis? QA5: During the study period, is the intervention administered (or exposure occurred) as intended?
Mixed methods	QA1: Is there an adequate rationale for using a mixed methods design to address the research question? QA2: Are the different components of the study effectively integrated to answer the research question? QA3: Are the outputs of the integration of qualitative and quantitative components adequately interpreted? QA4: Are divergences and inconsistencies between quantitative and qualitative results adequately addressed? QA5: Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?

Next, the chosen articles are examined based on the five criteria with three given preferences in displaying the responses (Yes, No & Can't tell). The chosen articles will be included in the SLR report after they surpassed at least three criteria. The process to finalize the insertion for the selected list articles is derived from the consensus of the authors. For any disagreement, it will be sorted up through a discussion among the authors. From quality appraisal process, the authors endorsed 25 articles passed the minimum quality requisite concerning of methodology and analysis. There are 9 articles qualified with all criteria, 13 articles competent of four assigned criteria, and three articles adequate for at least three criteria (Table 4).

Table 4
Result of the quality assessment

Study	Research Design	QA 1	QA 2	QA 3	QA 4	QA 5	Number of criteria fulfilled		Inclusion in the review
Kashive & Mohite (2022)	QN (NR)	Y	Y	Y	Y	Y	5	/5	Y
Oliveira *et al* (2022)	QN (NR)	Y	Y	Y	C	Y	4	/5	Y
Zamzami *et al* (2021)	MX	Y	Y	Y	Y	Y	5	/5	Y
Schobel, Janson & Leimeister (2022)	QN (RC)	Y	C	Y	Y	Y	4	/5	Y
Ricoy & Martinez (2022)	QL	Y	Y	Y	Y	Y	5	/5	Y
Kamid *et al* (2022)	MX	Y	Y	Y	Y	Y	5	/5	Y
Leitao et al (2022)	MX	Y	Y	Y	Y	C	4	/5	Y
Pope, Garnett & Dibble (2018)	MX	Y	Y	Y	Y	C	4	/5	Y
Davis et al (2018)	QN (NR)	Y	N	Y	N	Y	3	/5	Y
Hussein et al (2018)	MX	Y	N	Y	Y	Y	4	/5	Y
Zaric et al (2021)	QN (NR)	Y	Y	Y	N	C	3	/5	Y
Subirats et al (2023)	QN (NR)	Y	Y	Y	C	Y	4	/5	Y
Rodriguez & Arguello (2023)	MX	Y	Y	N	Y	C	3	/5	Y
Yan et al (2022)	QN (DC)	Y	Y	Y	C	Y	4	/5	Y
Li & Chu (2020)	MX	Y	Y	Y	Y	Y	5	/5	Y
Riaz et al (2019)	QN (DC)	Y	Y	Y	N	Y	4	/5	Y
Cheng et al (2023)	QN (NR)	Y	Y	Y	C	Y	4	/5	Y
Mosalanejad & Mansouri (2023)	QN (DC)	Y	Y	Y	N	Y	4	/5	Y
Kamimura, Naganuma & Takano (2018)	QN (DC)	Y	Y	Y	Y	Y	5	/5	Y
Bernando & Gonzalez (2021)	QN (DC)	Y	Y	Y	C	Y	4	/5	Y
Pietrapertosa et al (2020)	QN (RC)	Y	Y	Y	C	Y	4	/5	Y
Ccoa, Choquehuanca & Paucar (2023)	MX	Y	Y	Y	Y	Y	5	/5	Y
An (2021)	QL	Y	Y	Y	Y	Y	5	/5	Y
Ioannou (2018)	QL	Y	Y	Y	Y	Y	5	/5	Y
Jones et al (2019)	QN (DC)	Y	Y	Y	N	Y	4	/5	Y

QA=Quality assessment; QN (DC) = Quantitative descriptive; QN (NR) = Quantitative non-randomized; QL = Qualitative; MX = Mixed-Method; C = Can't tell

Data Extraction and Analysis

Data extraction process in SLR is uncompromising and well-structured as to be operated ensuring the validity and reliability of the review's results. This is crucial to minimize biases and offer an objective summary from the present literature basically on a specific subject matter. Fundamentally, the data extraction procedure was directly assisted by the research question. Founded on various research designs of review, the chosen articles were thematically evaluated to specify the best approaches of synthesizing the dissimilarities through qualitative synthesis (Whittemore and Knafl, 2005). Despite choices for qualitative synthesis, the authors chose to pursue the approach proposed by Flemming et al (2019) to focus on the flexibility of thematic synthesis in synthesizing data from many research designs.

The steps in the process of thematic synthesis which was proposed by Kiger and Varpio (2020) were conducted in this written review. The authors determined to recognize the patterns in previous studies by identifying retrieval connections which possibly presented. To proceed with the effort, the authors pursued the repetition in readings through the complete dataset. This scene has given valuable insight into the uncompleted process data and settled foundation for the authors in action.

For the next step, the authors proceed to create initial codes from well-arranged data. In this phase, the researchers specifically examined all selected articles. Then, the extraction process was implied on any relevant results by following the basis inquiry of the research. The generated themes have been the focus for the coming process. The researchers complemented with inductive coding frameworks. The observation was conducted for any interests, similarities, and connections among the extracted outcomes using the coded data. This means the themes were derived from the coded data in which included as an inductive coding framework. Braun and Clarke (2019) mentioned that the formation of retrieval themes was connected to the initial data and possibly represented the entire data set. As the result, the authors found three main themes to answer the developed research question. Afterwards, the researchers proceed with the same process for every single theme specifically to identify potential or hidden sub-themes.

Later, the upcoming process engaged to review the generated themes. The researchers considered the usefulness of the developed three main themes and merged sub-themes. Then, the outcomes of the primary themes and sub-themes were presented to three experts in qualitative synthesis and community development. The experts were asked to endorse the qualified main themes and sub-themes. In meantime, the experts were accountable about the applicability of the developed themes towards the research question as to be fully qualified and useful. The summary of the process can be seen in Figure 1.

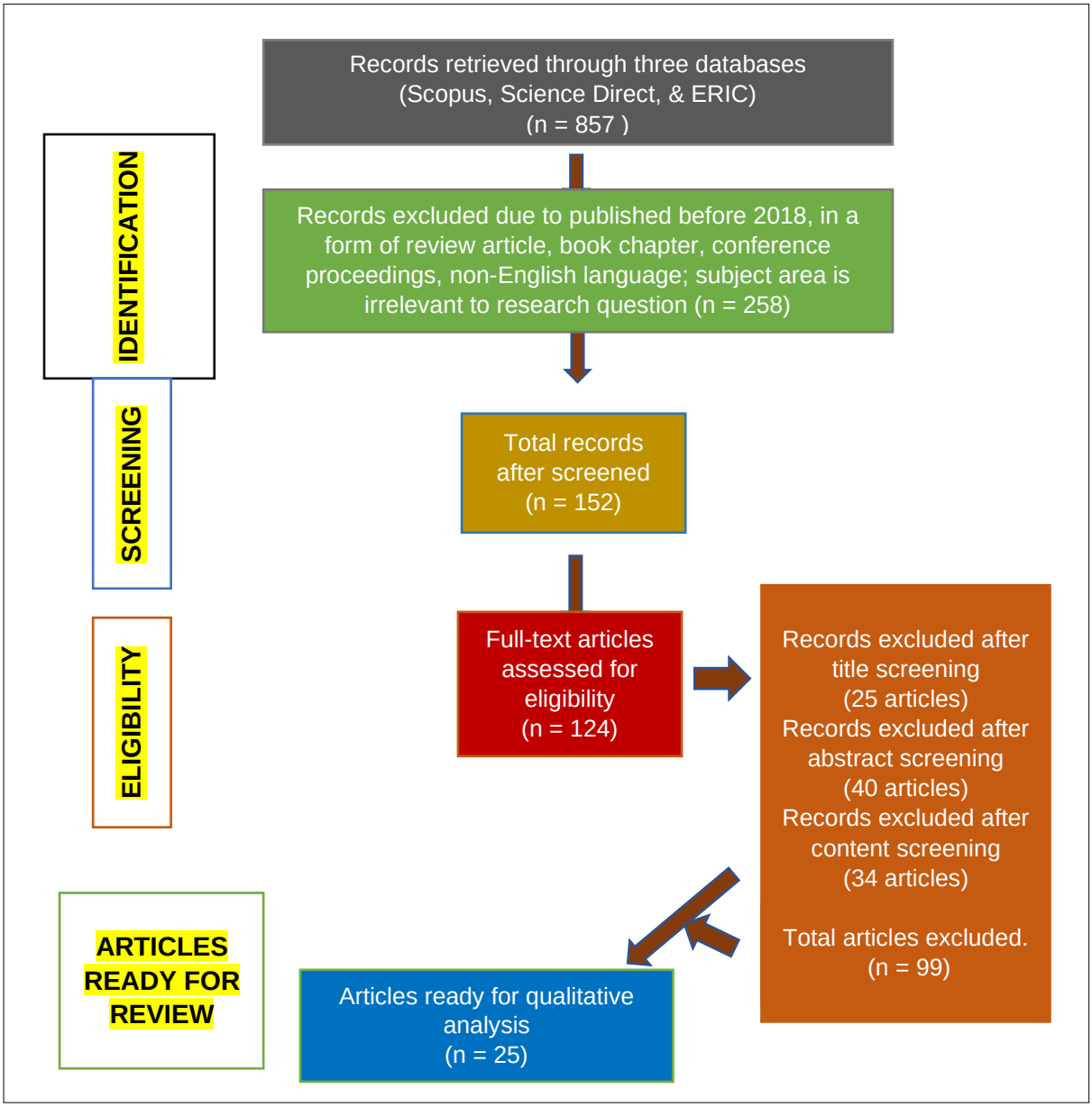

Figure 1: Flow diagram of the systematic search strategies for the SLR

Result

Background of the study

For this review, there are 25 qualified articles that have been chosen after the SLR process. There are 15 articles taken from Scopus research engine (Garnett & Dibble, 2018; Davis et al., 2018; Hussein et al., 2018; Li & Chu, 2020; Zamzami et al., 2021; Pope, Zaric et al., 2021; Kashive & Mohite, 2022; Oliveira et al., 2022; Schobel, Janson & Leimeister, 2022; Ricoy & Martinez., 2022; Kamid et al., 2022; Leitao et al., 2022; Yan et al., 2022; Subirats et al., 2023 and Rodriguez & Arguello, 2023). Next, seven qualified articles were chosen from Science Direct source (Kamimura, Naganuma & Takano, 2018; Riaz et al., 2019; Pietrapertosa et al., 2020; Bernando & Gonzalez, 2021; Cheng et al., 2023; Mosalanejad & Mansouri, 2023 and Ccoa, Choquehuanca & Paucar, 2023). Lastly, three relevant articles were captured from Eric

searching engine (Ioannou, 2018; Jones et al., 2019 and An, 2021). The summary of the counts can be shown in Figure 2.

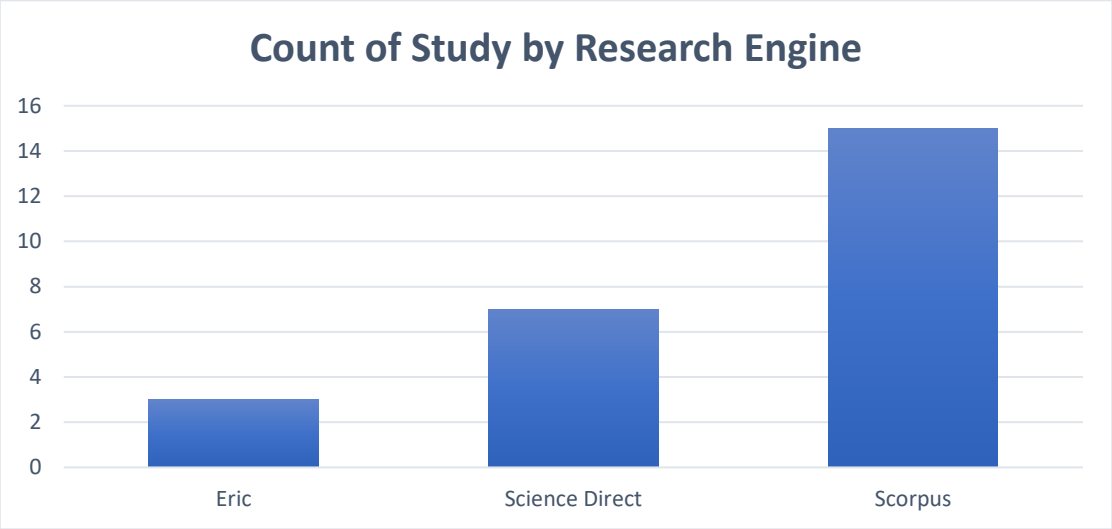

Figure 2: Count of Study by Research Engine

Next, based on the factor of research designs, the searching has found 14 quantitative articles (Davis et al., 2018; Kamimura, Naganuma & Takano, 2018; Riaz et al., 2019; Jones et al., 2019; Pietrapertosa et al., 2020; Zaric et al., 2021; Bernardo & Gonzalez, 2021; Kashive & Mohite, 2022; Oliveira et al., 2022; Schobel, Janson & Leimeister, 2022; Yan et al., 2022; Subirats et al., 2023; Cheng et al., 2023;Mosalanejad & Mansouri, 2023). Meanwhile, there are only three qualitative articles that were suitable from the SLR process (Ioannou, 2018; An, 2021 and Ricoy & Martinez, 2022). For the mixed method research design, there were eight articles selected Pope et al (2018); Hussein et al (2018); Li & Chu (2020); Zamzami et al (2021); Kamid et al (2022); Leitao et al (2022); Rodriguez & Arguello (2023); Ccoa et al (2023) as be shown in Figure 3.

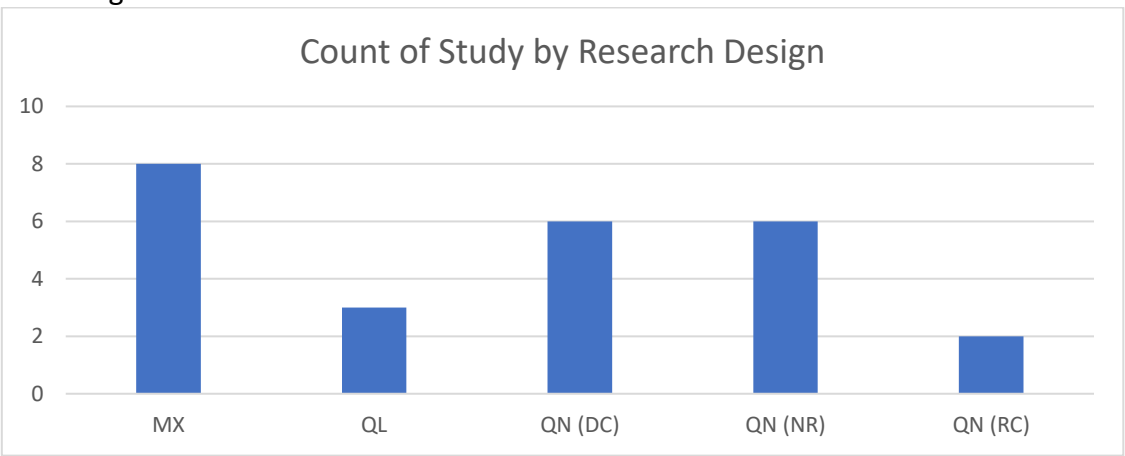

Figure 3: Count of Study by Research Design

The last factor from the findings is year basement, as the range of the searching process was taken from year 2018 until 2023. We started from year 2018, where there were five chosen articles (Pope, Garnett & Dibble, 2018; Davis et al., 2018; Hussein et al., 2018; Kamimura, Naganuma & Takano, 2018 and Ioannou, 2018). Next, two articles were collected from the year 2019 (Riaz et al., 2019; Jones et al., 2019) and another two articles were from year 2020

(Li & Chu, 2020 and Pietrapertosa et al., 2020). Then, four articles were derived from year 2021 (Zamzami et al., 2021; Zaric et al., 2021; Bernando & Gonzalez, 2021 and An, 2021). The SLR process found the contribution of seven articles from year 2022 (Kashive & Mohite, 2022; Oliveira et al., 2022; Schobel, Janson & Leimeister, 2022; Ricoy & Martinez, 2022). For the final list, there were five articles selected from year 2023 (Subirats et al., 2023; Rodriguez & Arguello, 2023; Cheng et al., 2023; Mosalanejad & Mansouri, 2023 and Ccoa, Choquehuanca & Paucar, 2023). The summary illustrated in Figure 4.

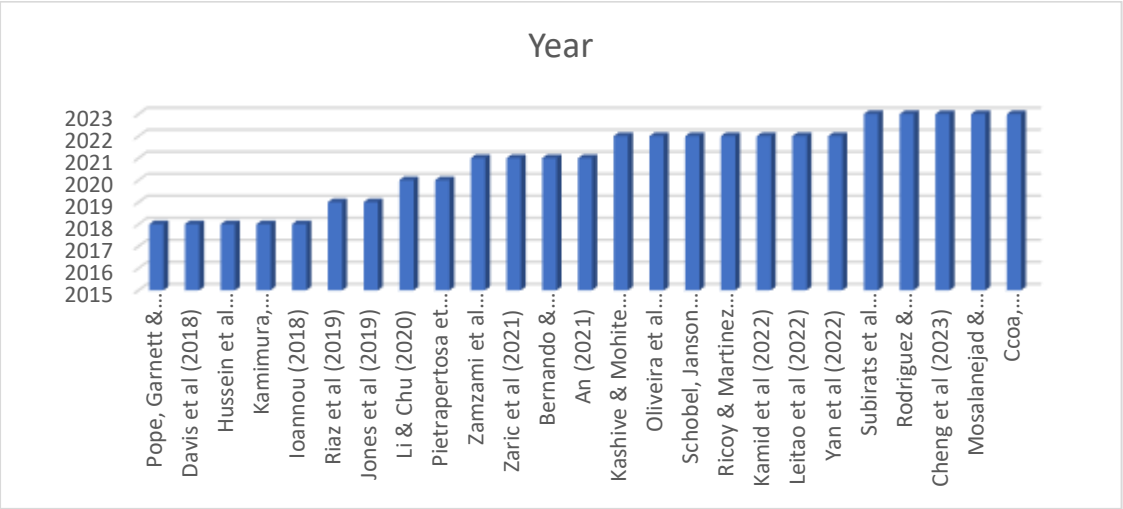

Figure 4: Total of Articles by Year

The Developed Themes

Table 5

Findings

	Behavioural Engagement			Emotional Engagement			Cognitive Engagement	
Study	IL	PA	Part	Fun	Inte	Ent	PSS	KC
Kashive & Mohite (2022)						/		/
Oliveira *et al* (2022)		/	/					
Zamzami *et al* (2021)			/				/	/
Schobel, Janson & Leimeister (2022)				/	/		/	
Ricoy & Martinez (2022)	/	/	/	/	/	/		/
Kamid *et al* (2022)			/		/	/	/	/
Leitao et al (2022)				/				/
Pope, Garnett & Dibble (2018)				/		/		
Davis et al (2018)		/	/	/		/		
Hussein et al (2018)	/	/	/	/		/		
Zaric et al (2021)	/		/	/	/			
Subirats et al (2023)						/		
Rodriguez & Arguello (2023)	/		/			/		
Yan et al (2022)	/		/	/				/
Li & Chu (2020)	/	/			/	/		
Riaz et al (2019)			/			/		
Cheng et al (2023)			/			/	/	
Mosalanejad & Mansouri (2023)	/	/				/		/
Kamimura, Naganuma & Takano (2018)						/		
Bernando & Gonzalez (2021)				/	/		/	
Pietrapertosa et al (2020)			/					
Ccoa, Choquehuanca & Paucar (2023)	/			/		/		
An (2021)		/	/	/		/		
Ioannou (2018)			/					
Jones et al (2019)	/		/	/				

Independent Learning	IL
Positive Attitude	PA
Participation	Part
Fun	Fun
Interest	Inte
Enthusiasm	Ent
Problem Solving Skills	PSS
Knowledge Construction	KC

Behavioral Engagement

This factor has been the focus of study to support the research's main objective. There are three sub-categories which are discussed in the selected articles. Each sub-theme has its own unique explanation about behaviors factors that affected by fun learning implementation.

Independent Learning

In our modern education, the usage of information and communication technology (ICT) is highly demanded and complied with advanced learning needs. Plus, the use of ICT is also got along with the requirement of presently manner of fun learning. The medium of ICT supported in gamification is partly responsible for the increase in students' attention during schooling session (Ricoy & Martinez, 2022). This situation is shown in study by Ricoy and Martinez (2022), where the teachers can supervise their students assimilated the process of recycling school project. The students are able to keep apart wastage and deposit waste into the convenient container by themselves. In the same path, Hussein et al (2018) mentioned how game-style learning boost students' self-reliance to gain more knowledge regarding sexual health matters. The gamification-based approaches allow students to learn at their own pace and explore the topic of sexual health matters. These situations are approved by Zaric et al (2021), the factor of well-organized fun game learning able to affect users' self-involvement for education understanding.

Besides that, Rodriguez and Arguello (2023) referred to a situation on how the students applied their own understanding into fun game mechanism works, in order to win the fulfilment of study. Students' behavior in term of independence is positively affected by the perceived learning task, where the students are aware of the usefulness of the online gamified classroom (Yan et al., 2022). After students get the understanding from edutainment, it will lead to independent learning process. The situation can be shown with the intense engagement in gamified electronic medium will be able to support the students' learning improvement in reading habit by themselves (Li & Chu, 2020).

Next, gamification as fun learning medium promotes positive self-governance into students' behavior (Mosalanejad & Mansouri, 2023). Students are able to improve their learning skills by themselves through the e-learning platform compared to traditional method. As the result, students become more comfortable to demonstrate their knowledge with their own perception (Ccoa et al., 2023). Plus, it fits the modern education approach of more to self-effort by using technology in life. As stated by Jones et al (2019), the influence of modern edutainment is likely to impact students assuredly, where they are able to create their own positive environment through KAHOOT games. Finally, we can approve of the great impact of the edutainment towards students' behavior for independent learning.

Positive Attitudes

For second part is about learners' good side of attitudes that influenced by the fun learning approach. A study by Ricoy and Martinez (2022) shows the positive attitudes on respect for the environment displayed by students due to utilization of gamification. The study showed after students get exposed with attractive videos about the awareness towards environment, they improved themselves to care about environment in the right way. Davis et al. (2018) approved it through his study, on the positive responses from students whenever they are involved in educational games medium. The more frequently students are involved with fun learning elements, the more they get affected to adapt positive manners.

By the implementation of edutainment, students are able to evaluate themselves of having good attitudes after exposed with knowledgeable matters (Hussein et al., 2018). Students will change themselves for the sensible manners version because they alerted with the given knowledge. Then, a study by Li and Chu (2020) shows the effect of gamification in learning can be seen after students change their studying attitudes. Student will improve academic performance and become more competent in the learning process. This proves that gamified learning version can impact students showing positive attitudes or behaving in good manners (An, 2021; Mosalanejad & Mansouri, 2023). It can be shown through the good changes that happened before and after the implementation of fun learning factors.

Participation

The third factor is the participation of learners within the usage of gamification medium or game-based learning. The participation of learners in fun learning program presents them as they become more mature through deeper involvement. People who attend mostly in gamification approach seems to have more experiences for understanding specific circumstances on learning process (An, 2021; Oliveira et al., 2022).

Apart from that, the implementation of flipped learning and gamification instruction happened to influence students' behavioral engagement (Jones et al., 2019; Zamzami et al., 2021). This fun learning elements made students become engaged actively. The students who participate or join actively in classroom session show positive changes in academic performance (Zamzami et al., 2021; Ricoy & Martinez, 2022; Kamid et al., 2022). Furthermore, when the edutainment medium is meticulously structured with additional game mechanism features, the learning process attracts students to participate appropriately (Davis et al., 2018; Hussein et al., 2018; Zaric et al., 2021). Due to the similarities in game technically, learners are encouraged and interested to participate within the educating process (Pietrapertosa et al., 2020; Yan et al., 2022; Rodriguez & Arguello, 2023).

At the same time, a fun learning mechanism usually offers rewards or recognition for the involvement. Students become motivated to join the educating session because they get rewarded for their effort in getting knowledge (Riaz et al., 2019). When all the students are able to participate actively in learning, it will improve the students' interaction towards each other (Ioannou, 2018). This situation had led to the positive increasing of students' behavior.

Emotional Engagement

As the second main theme, we can see that emotional engagement happened through the practice of fun learning. Three sub-themes of fun or enjoyment, interest of students, and enthusiasm of learners were mentioned in most of the selected articles.

Fun

The implementation of fun learning gives a positive impression of enjoyment and good emotional factor in getting knowledge. Studies by Hussein et al. (2018) and Schobel, Janson and Leimeister (2022) show the positive emotional engagement and satisfaction feeling as the students get rewards for their participation in the learning process. The elements of game-based learning such interactive games attract students to learn along with enjoyment feelings (Ricoy & Martinez, 2022). The good experiences from edutainment process transmit fun emotions for students to learn intelligence (Pope et al., 2018; Zaric et al., 2021; Leitao et al., 2022). This is a good factor for students to learn with enjoyment feeling.

Next, the function of educators in applying game-based learning medium in educating process implied positive attraction of giving joy and thrill feeling to learn (Yan et al., 2022). Students become comfortable to learn and get valuable understanding. Likely, students easily to acquire knowledge using playful approach with gratification feeling (An, 2021; Bernardo & Gonzalez, 2021; Ccoa et al., 2023). The injection of edutainment process influences the learning activity to become more interactive and attractive to give positive mood for students (Jones et al., 2019). As the conclusion, the happiness and satisfaction of doing fun learning are positively impact the learners' emotion.

Interest

Schobel, Janson and Leimeister (2022) mentioned that emotional engagement is one such driver of positive problem-solving end-result from game-based learning. This situation happened because of the students' interest in learning. The factor of fun strategies such as experimentation and students' interaction activities fascinate students to develop themselves in academic (Ricoy & Martinez, 2022). Additional proof by Kamid et al (2022), the implementation of traditional fun learning element for mathematics subject has attract students' interest to well-understand the real calculation. Next for chemistry subject, fun learning approach has awakened the student's interest to learn deeper with understanding (Bernando & Gonzalez, 2021). For sure, learners will express large interest to study on something with enjoyment (Li & Chu, 2020; Zaric et al., 2021). As conclusion, the interest factor from enjoyment learning impacted positively students' emotion.

Enthusiasm

Through globalization, there is an important function of fun electronic learning process in giving motivational value of enthusiasm to earn valuable knowledge (Kamimura et al., 2018; Ricoy & Martinez, 2022; Kashive & Mohite, 2022). When teachers apply joy learning mechanism for students, it will foster enthusiasm to develop understanding in academic (Pope et al., 2018; Kamid et al., 2022). The good spirit to learn on something can be seen whenever the attraction of gamification or game-based learning is well-implied (Davis et al., 2018).

We can see fun education element positively impacts students with great self-motivation rather than using traditional teaching approach (Hussein et al., 2018; Mosalanejad & Mansouri, 2023) such "talk and chalk" or giving "sleeping lecture". Next, the factor of relevant and attractive activities is also can be seen to give enthusiasm mood towards learners in learning process (An, 2021; Ccoa, Choquehuanca & Paucar, 2023; Subirats et al., 2023). Most of the students earned intrinsic or extrinsic motivation and got high spirit to fulfil the education approach through thrilling programs (Riaz et al., 2019; Li & Chu, 2020; Cheng et al., 2023; Rodriguez & Arguello, 2023). For conclusion, enthusiasm of learners influenced by the well-designed enjoyment learning approach because of needs to pleasure good feeling.

Cognitive Engagement

The authors realized the effects on cognitive engagement for the third theme. Based on retrieved data, there are two sub-themes of problem-solving skills and knowledge construction which are mostly mentioned.

Problem Solving Skills

In the edutainment approach, students can be assessed to solve given problem by themselves in a group. The interactions among the group members will happen and lead to a discussion or sharing session. Students will be able to solve the given problem as they share opinions and ideas accordingly to get the suitable solution (Zamzami et al., 2021). In the same position, teamwork abilities are proven to develop strategic skills for students in handling problem within the fun learning medium (Bernardo & Gonzalez, 2021).

Next, the usage of entertaining learning process such games and live activities is pertinent towards developing learners' problem-solving skill (Schobel et al., 2022). A proven study by Kamid et al (2022) shows the pursuit for traditional making of kite can teach students about solving problems in Mathematics subject. Cheng et al (2023) mentioned block-based programming for students has increased their level of confidence to solve problem. These display the ability of edutainment approach to construct students' problem-solving skill accordingly.

Knowledge Construction

Kashive and Mohite (2022) declared the situation of application for gamified e-learning within the pedagogy will enhance the improvement of learning experience. This explains how the learning experience can influence the construction of knowledge for thinking skills. The study by Zamzami et al (2021) gives evidence for adopting the flipped educating approach to improve students' knowledge construction. Students' participation in the flipped learning method helps flexibility in continuous knowledge.

Afterwhile, the usage of gamification strategies with the supports from Google and YouTube able to boost the pupils' acquisition of knowledge and skills (Ricoy & Martinez, 2022). The knowledge construction can be seen through the applicable of students' skill in communication, making observation and processing data (Kamid et al., 2022). Constantly, knowledge acquisition is getting from exploration, doing actions and experimentation Leitao et al., 2022). Students are rationally to explore the intrinsic connections of the class content to create a good environment of classroom in getting knowledge (Yan et al., 2022). This kind of interaction to create social communications to each other in terms of constructing information to be understood together (Mosalanejad & Mansouri, 2023). For outcome, students' thinking skills and interaction in learning is explaining about cognitive engagement which influenced by fun learning process.

Discussion

For the first part of discussion, the author likely to simplify about three sub-themes from behavioral engagement of independent learning, positive attitudes, and participation shown by the learners. These three sub-themes are presenting information and data based on behavioral engagement which can be added with extra focus of matter.

The first sub-theme of independent learning is likely to be discussed for learner's behavior through the application of edutainment techniques. There are nine chosen articles that give data about independent learning factor which are determined by the operation of fun educating process. Those articles stated about the usage of modern fun learning methods such as ICT, Kahoot games, and flipped classroom. These modern enjoyable learning mediums are applicable and complement students' development.

The implementation of gamified e-learning is intensifying the learning experience by own effort and less supervision. The educators only functioned as the guide to assist the

learners. Meanwhile the students must get through the modern fun learning process by themselves using the fast-developed information technology. The benefits of independent learning should be well-consumed if the learners do not misuse modernity negatively. Furthermore, independent learning factor positively shows directly how the fun learning mechanism dominates the construction of students' behavior. The activities in edutainment have trained students to become more mature and independent towards self-improvement (Li & Chu, 2020). Students should be self-reliable in order to help them making good decision in the future.

For the second sub-theme of behavioral engagement, there are six selected articles mentioned about the positive attitudes formed by the approach of enjoyment education. To attract students to earn about some knowledge, the utilization of well-developed fun educating method is compulsory. Ricoy and Martinez (2022) displayed the positive utilization of online game-based learning to take good care of our environment. It gives awareness towards students' imagination of the real situation about how to keep our polluted environment nowadays. Environmental awareness from edutainment able to construct positive manners. Learners will be able to react to themselves and others with sensible attitudes. Hussein et al (2018) stated that students will proceed to evaluate themselves of showing good attitudes or not because they have good understanding and information about some matters.

Next, there are 15 articles that give information about students' participation. The varieties and attractive activities in fun learning let students to participate for benefit. The students who participate or join actively in classroom session show positive changes in academic performance (Zamzami et al., 2021; Ricoy & Martinez, 2022; Kamid et al., 2022). The more students to participate, the more positive manners students can react. In addition, there is an element of rewarding and recognition for students' participation in fun learning process as mentioned by Riaz et al (2019). The rewarding and recognition system such as button badge or gift able to accelerate students' motivation. Students feel appreciated for their effort and are motivated to develop themselves.

For the sub-theme of fun from emotional engagement, there are 12 articles related. All the chosen articles mentioned the good emotion and satisfaction feeling, as the learners can adapt the benefits of edutainment. Through enjoyable involvement, they will gain valuable experience. The positive experiences will transmit enjoyment emotions for students to be comfortable during the learning process (Zaric et al., 2021). With a comfortable ambience, students will be constantly well-behaved while learning. It shows the fun learning process may construct learners' behavior, plus achieving the education objectives.

Kalsum *et al* (2023) mentioned that 21st century learning activities have a positive relationship with students' motivation in learning. The usage of ICT gamified learning method is not only improving children' digital capability, but also instill positive behaviors emotionally (Ricoy & Martinez, 2022). For the enthusiasm factor, the applied game-based in fun education allows learners get the opportunity to be praised for their learning participation rather than performance in examination. The appreciation for their learning passion must be recognized to promote their spirit consistently. Daily evaluation with positive compliments for learners is able to improve their motivation and enthusiasm to study (Kamimura et al., 2018).

The author would like to highlight the factors of problem-solving skill and knowledge construction. An enjoyable educating process increases the level of thinking skills. Students' engagement in game-based learning can enhance the student-generated questions ingenuity. When students are capable to ask rationale questions, they show the qualification to identify,

interpret, and gather information for the contents. For instance, as they enjoy the fun educational approach such maze games, students are able to improve their computational thinking (Cheng et al., 2023). The rise of computational thinking is one of the problem-solving skills considered as students' development.

Aside from that, the technology of fun learning nowadays seemed to upgrade the acquisition of knowledge (Leitao et al., 2022). Learners are required to understand the rules and follow the game's instructions. It shows their progression to build experience towards the knowledge contents. Students are able to behave themselves enclosed by given rules and regulations of the game-based learning tool, in order to figure out the knowledge capacity. We can assume the three themes; behavioral, emotional, and cognitive engagements are sufficient to prove the development of students' behavior adequately.

Conclusion

After carrying out a systematic review process, the authors concluded that there is a construction process in students' behavior regarding the implementation of fun learning methodology. Those 25 qualified articles were selected to give appropriate data to be reviewed. They came with data from mixed method, quantitative and qualitative approaches. The 25 chosen articles undergo thematic analysis, resulting in three main themes of behavioral engagement, emotional engagement, and cognitive engagement. These three main themes were selected including eight sub-themes. Those retrieval sub-themes give detailed explanation to answer the research question; 'How the fun learning influences the development of students' behavior?'.

Based on the systematic reviewed, the implementation of varieties modern edutainment method has shown positive changes towards students' attitudes. The modernization in education has been fully utilized by the teachers to attract students' attention. Furthermore, the transition teaching methods of enjoyment education nowadays are pursuing today's globalization fulfillment. We need to ensure the applications of modern fun learning for students are good enough to give exposure of behavior development. This is important to help motivating students balance their academic performance and own moral values. Students should be well-constructed for their behaviors and attitudes, so that they can handle themselves in future.

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