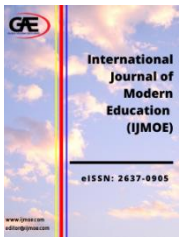
International Journal of Modern Education
EISSN: 2637-0905
IJMOE
Volume 6 Issue 23 (December 2024) PP. 613-629
DOI: 10.35631/IJMOE.623042



INTERNATIONAL JOURNAL OF MODERN EDUCATION (IJMOE)
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GAMIFICATION ADAPTATION IN TEACHING AND LEARNING AMONG THE SECONDARY SCHOOL TEACHERS IN MALAYSIA

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Article Info:

Article history:
Received date: 27.10.2024
Revised date: 11.11.2024
Accepted date: 15.12.2024
Published date: 24.12.2024

To cite this document:

Ismail, Z. H., Shahabuddin, M. Z., & Muhamad, F. N. (2024). Gamification Adaptation In Teaching And Learning Among The Secondary School Teachers In Malaysia. *International Journal of Modern Education, 6* (23), 613-629.

DOI: 10.35631/IJMOE.623042

Abstract:

The integration of gamification in education garnered significant attention in recent years to engage learners and enhance their learning experiences innovatively. Gamification in educational setting is an approach that uses games to support students learn. However, there are a few challenges faced by the secondary school teachers on how to adapt gamification in teaching and learning process. Therefore, this study aims to obtain information, then descriptively analyse the awareness and knowledge of gamification and the challenges of adapting gamification in teaching and learning with respect to the adaptation of gamification in teaching and learning. Based on this study, most teachers were highly aware and have knowledge about gamification in teaching and learning. The potential advantages and disadvantages of adapting gamification in teaching and learning also can be identified from this study. A questionnaire is used as the instrument of the research. The respondents were the secondary school teachers from all around Malaysia. There is a total of 50 questionnaires that has been collected and were returned satisfactorily. Statistical Package for Social Science (SPSS) computer software program is used to analyse and interpret the data. A descriptive analysis that includes mean, standard deviation and percentages for each component in the challenges of adapting gamification in teaching and learning. Most of the respondents have an uncertain view of adapting the gamification in teaching and learning process but agreed about the potential of gamification in sustaining the learner engagement and motivation.

International Journal of Modern Education
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Keywords:

Gamification In Education, Awareness Of Gamification, Challenges Of Adapting Gamification

Introduction

The integration of digital tools into education is transforming teaching and learning globally, and Malaysia is actively embracing this shift. The Ministry of Education's emphasis on digital platforms, as evidenced by the Malaysia Education Blueprint 2013-2025, has encouraged educators to explore innovative approaches such as digital content development, which gamification is part of, to enhance student engagement and learning outcomes. Gamification, the use of elements from games in non-gaming contexts, has the potential to improve learning experiences by increasing engagement, motivation, and enjoyment (Luarn, Chen & Chiu, 2023). However, teachers' awareness of, mindsets toward, and willingness to overcome implementation-related barriers are critical to the successful adoption of gamification in Malaysian classrooms.

The research presented here explores the essential factors affecting the incorporation of gamification into teaching and learning (T&L) in Malaysian schools. Specifically, this study focuses on three key areas:

1. ***Teachers' Awareness and Knowledge of Gamification in T&L*:** This research will investigate the extent to which teachers are aware of gamification as a pedagogical tool, their understanding of its principles and potential benefits, and the sources from which they acquire information about gamification.
2. ***Perception of Gamification in T&L*:** This study will examine teachers' attitudes, beliefs, and overall perceptions towards gamification. It will explore whether teachers perceive gamification as a valuable addition to their teaching toolkit, the potential advantages and disadvantages they associate with it, and their willingness to incorporate it into their classrooms.
3. ***Challenges Faced by Teachers*:** This research will identify and analyze the specific challenges that teachers encounter in implementing gamification. These challenges may include limited skills or knowledge in designing and implementing gamified activities, resistance to change due to comfort with traditional teaching methods, lack of time or resources, or technical difficulties.

By exploring these key dimensions, this research seeks to provide a comprehensive understanding of the factors influencing the adoption and effective utilization of gamification in Malaysian schools. The findings will contribute valuable insights to inform the development of targeted professional development programs, support resources, and policy recommendations aimed at empowering teachers to harness the potential of gamification to enhance student learning experiences.

Literature Review

Gamification is the strategic application of game elements and principles in non-game contexts. By incorporating game mechanics like points, badges, leaderboards, or challenges into platforms like websites, online communities, or learning management systems, businesses can

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Volume 6 Issue 23 (December 2024) PP. 613-629
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significantly enhance user engagement and participation. The primary goal of gamification is to motivate and inspire individuals to actively engage with the platform or application. By creating a fun and rewarding experience, gamification can encourage collaboration, sharing, and interaction among users.

Awareness and Knowledge of Gamification

Previous research has explored educators' awareness and understanding of gamification. For instance, the paper titled "Research on Online Teachers' Training Based on the Gamification Design: A Survey Analysis of Primary and Secondary School Teachers" by Liu, Oubibi, Zhou, and Fute (2023), examines the effectiveness of online teacher training programs that incorporate gamification. The study focuses on primary and secondary school teachers and explores how gamification can enhance teacher knowledge and improve their teaching practices.

Similarly, R.W Mee Mee, T.S.T Shahdan, M.R Ismail, and K.A Ghani (2020) explores the perspectives of 33 pre-service teachers on the use of gamification in classroom teaching. The study employs a quantitative survey research methodology to gather data on the participants' views. The findings indicate that the study successfully raised awareness among pre-service teachers about the importance of gaining knowledge and skills in gamification for effective classroom teaching. The authors highlight the potential of gamification to enhance engagement and learning outcomes, emphasizing the need for further professional development in this area.

The study by Chen, Chang, and Wu (2020) explores the impact of gamified classroom management on elementary students' divergent thinking and creative tendencies. The researchers implemented a role-playing gamified program called "Class of Oz," where students assumed different roles and completed tasks. The results showed that students in the gamified environment exhibited significantly higher verbal divergent thinking and creative tendencies, particularly in curiosity and imagination, compared to those in a traditional classroom setting.

Educators have adapted their teaching methods to help students become lifelong learners. Research shows that students who experience gamification and game-based learning perform significantly better academically and have more positive attitudes toward learning compared to those who follow traditional methods. Properly designed educational games were beneficial to students' engagement, concentration and aspects of trial and error (Partovi and Razavi, 2019).

Challenges of Adapting Gamification in T&L

Despite its potential benefits, the integration of gamification in education presents several challenges. Adaptive Gamification in E-Learning by Bennani and Maalel (2022) provides a comprehensive review of the literature on adaptive gamification in e-learning. It examines current methodologies, technologies, and strategies employed to tailor gamification to individual learning needs. The paper emphasizes the need for further research and development in areas such as artificial intelligence and machine learning to address the current limitations and fully realize the benefits of adaptive gamification in education.

Gamification is becoming popular around the world because it can make learning more engaging and effective. By incorporating game elements into education, teachers can solve

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various problems and improve student motivation and participation (Macías, Z. L. V., Hernández, A. A. R., and Saenz, C. L. S., 2020).

K. Tenório, D. Dermeval, M. Monteiro, and A. Peixoto (2020) explores how teachers' empowerment can be enhanced through gamification in adaptive learning systems. The research emphasizes the need for teachers to be more involved in the design process of gamification to better tailor learning experiences. The study employs qualitative methods to analyze how teachers' perceptions and involvement can impact the effectiveness of gamified learning systems. It suggests that increased teacher empowerment and involvement can lead to more effective and adaptable gamification strategies, ultimately improving student engagement and learning outcomes.

In recent years, interest in digital game stimuli in higher education has surged, particularly due to the shift to e-learning platforms during the COVID-19 pandemic. Alzahrani, F. K. J., and Alhalafawy, W. S. (2022) systematically reviews literature on gamification in e-learning to identify its benefits and challenges. The review, based on twenty-four studies from the Web of Science, highlights benefits such as improved educational outcomes, enhanced learner engagement, and motivation. However, it also identifies challenges including difficulties in managing virtual classrooms, mismatch with learners' sensory patterns, boredom from repetitive activities, and issues with internet connectivity.

The Potential of Gamification in Sustaining Learner Engagement and Motivation

Despite the challenges, numerous studies have demonstrated the positive impact of gamification on learner engagement and motivation. The paper by Zourmpakis, Kalogiannakis, and Papadakis (2023) explores the effects of adaptive gamification on students' motivation in science education. The study involves the development and implementation of an adaptive gamification environment tailored to enhance learning experiences. They analyze how different game elements impact student motivation, considering both the design and adaptability of these elements. The findings indicate that properly implemented adaptive gamification can significantly boost students' engagement and motivation, but challenges in adaptation and execution must be addressed to maximize its effectiveness.

Bouchrika, I., Harrati, N., Wanick, V., and Wills, G. (2021) examine the effects of gamification on students' engagement and participation in e-learning environments. The study investigates whether gamification strategies can enhance student motivation and contribute to sustained learning by making educational experiences more interactive and motivating. It theorizes that gamification can significantly boost students' involvement and motivation to achieve learning objectives.

Ng, L. K., and Lo, C. K. (2022) explore how integrating flipped classroom methods with gamification strategies affects student performance and academic commitment. The study emphasizes that sustainable learning is dependent on sustained learner engagement, and suggests that gamification can enhance learner achievement and motivation by making learning activities more engaging. They argue that the combination of flipped classroom pedagogy and gamification has the potential to foster better academic outcomes and commitment among students.

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The integration of gamification in education offers a promising approach for enhancing learner engagement and motivation. While educators may face challenges in implementing gamification effectively, the potential benefits, such as increased student interest and improved learning outcomes, make it a worthwhile endeavor. Future research should focus on developing practical strategies for educators to overcome challenges and maximize the positive impact of gamification in educational settings.

Methodology

The study was conducted in Malaysia, and 50 secondary school teachers were picked, regardless of their fields and types of school. Following the encouragement from the Ministry of Education to emphasise the digital platforms, the adaptation of gamification in teaching and learning has been one of the teaching and learning tools in order to enhance student engagement and learning outcomes.

The questionnaire consists of three sections which are Section A, Section B, and Section C. There are 22 items that were developed and personally administered according to the research objectives. For Section A and Section B, the researchers used multiple choice questions while for Section C, the items were designed using the Likert scale to ease the respondents in making their choices.

Figure 1: The Front Page Of The Questionnaire

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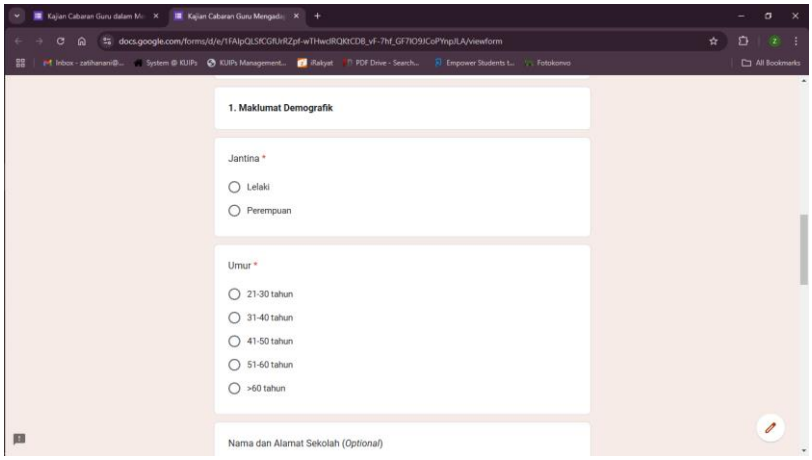

Figure 2: Section A

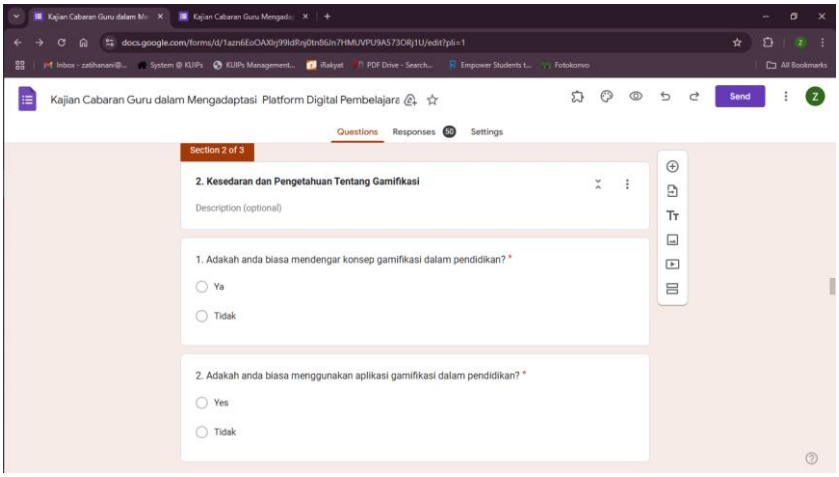

Figure 3: Section B

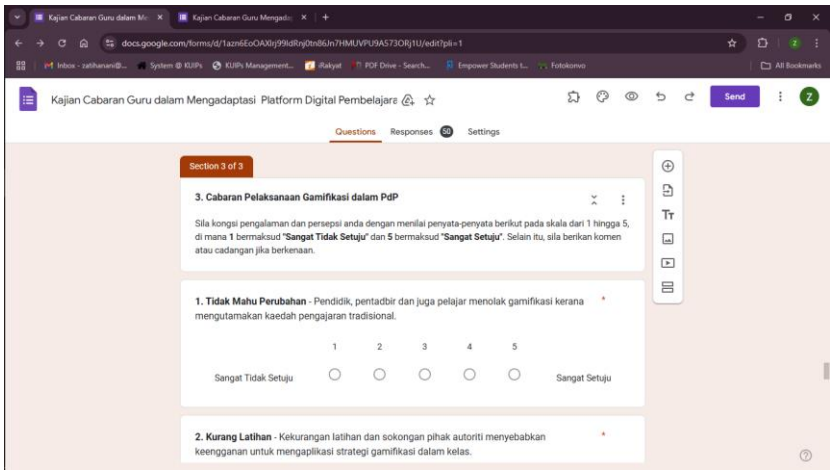

Figure 4: Section C

Almost three months the replies to the questionnaire were collected in order to regularly alert and monitor sampling responses. A convenient sampling technique was adopted. The questionnaire has been distributed among the secondary school teachers in Malaysia. The mediums that been used to distribute the questionnaire are WhatsApp Group, Facebook and

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also email to the secondary schools in Malaysia. A total of 50 questionnaires were returned satisfactorily.

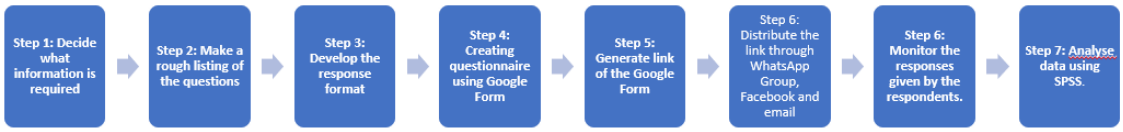

Figure 5: The Steps Of Data Collection

A descriptive study that includes mean, standard deviation and percentages for each component for the challenges of adapting gamification in teaching and learning. Before applying this analysis, the validity and reliability of the research questionnaire were examined using the Cronbach's Alpha values. Table 1 summarises the information of the questionnaire used in this study.

Table 1: Result of Liability Test

Variables	Number of Item	Source	Cronbach's Alpha
Section A: Demographic Profile	7	Designed by researchers	-
Section B: Awareness and Knowledge about gamification	5	Designed by researchers	-
Section C: Challenges of adapting gamification in teaching and learning process	10	Designed by researchers	0.715

The data were then been analysed and interpreted by using Statistical Package for Social Sciences (SPSS) computer software program. For this study, the IBM SPSS Statistics 27th Version is used. The IBM SPSS is a software that offers statistical analysis and easy to use for data analysis.

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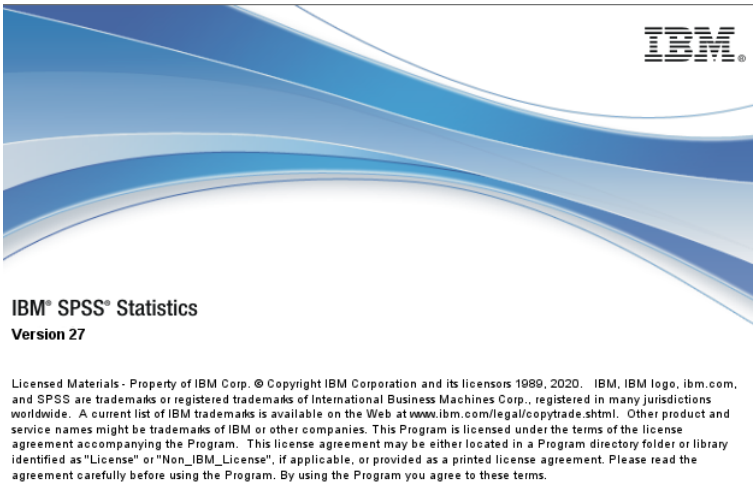
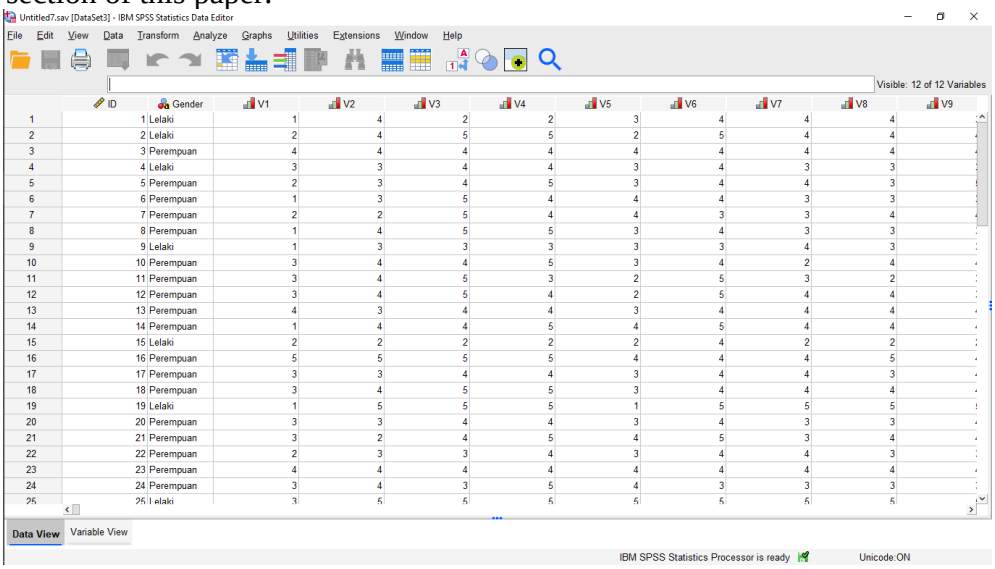


Figure 6: IBM SPSS Statistics 27th Version

All the data collected from the questionnaire that consist of three sections which are Section A, Section B, and Section C will be imported into the SPSS as shown in Figure 7 until Figure 9 below. Then, the SPSS will do the descriptive analysis for all the three sections which includes the mean, standard deviation and percentages for each component in the challenges of adapting gamification in teaching and learning. The detail of the results will be discussed in the next section of this paper.



	ID	Gender	V1	V2	V3	V4	V5	V6	V7	V8	V9
1	1	Lelaki	1	4	2	2	3	4	4	4	
2	2	Lelaki	2	4	5	5	2	5	4	4	
3	3	Perempuan	4	4	4	4	4	4	4	4	
4	4	Lelaki	3	3	4	4	3	4	3	3	
5	5	Perempuan	2	3	4	5	3	4	4	3	
6	6	Perempuan	1	3	5	4	4	4	3	3	
7	7	Perempuan	2	2	5	4	4	3	3	4	
8	8	Perempuan	1	4	5	5	3	4	3	3	
9	9	Lelaki	1	3	3	3	3	3	4	3	
10	10	Perempuan	3	4	4	5	3	4	2	4	
11	11	Perempuan	3	4	5	3	2	5	3	2	
12	12	Perempuan	3	4	5	4	2	5	4	4	
13	13	Perempuan	4	3	4	4	3	4	4	4	
14	14	Perempuan	1	4	4	5	4	5	4	4	
15	15	Lelaki	2	2	2	2	2	4	2	2	
16	16	Perempuan	5	5	5	5	4	4	4	5	
17	17	Perempuan	3	3	4	4	3	4	4	3	
18	18	Perempuan	3	4	5	5	3	4	4	4	
19	19	Lelaki	1	5	5	5	1	5	5	5	
20	20	Perempuan	3	3	4	4	3	4	3	3	
21	21	Perempuan	3	2	4	5	4	5	3	4	
22	22	Perempuan	2	3	3	4	3	4	4	3	
23	23	Perempuan	4	4	4	4	4	4	4	4	
24	24	Perempuan	3	4	3	5	4	3	3	3	
25	25	Lelaki	3	5	5	5	5	5	5	5	

Figure 7: Data for Section A

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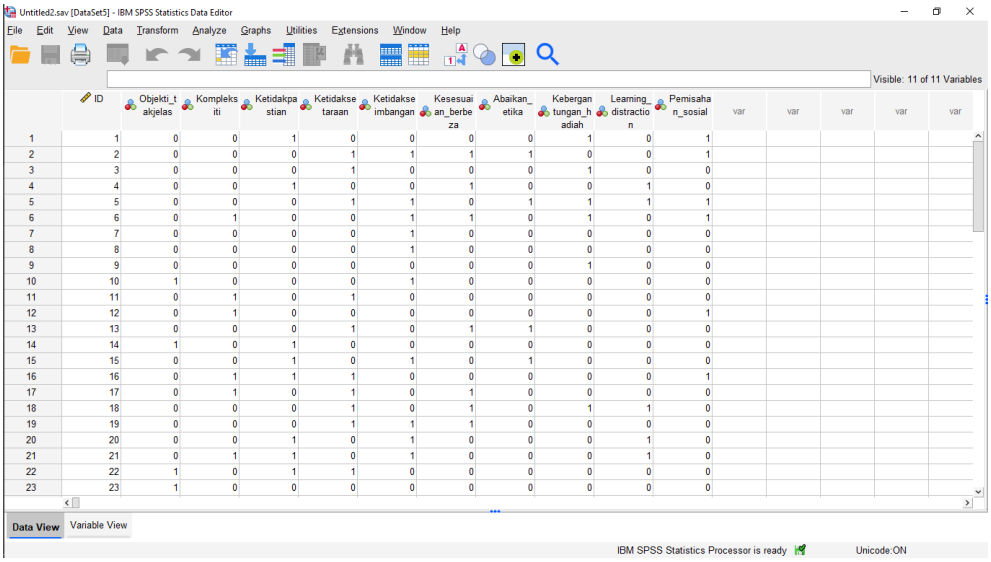

Figure 8: Data for Section B

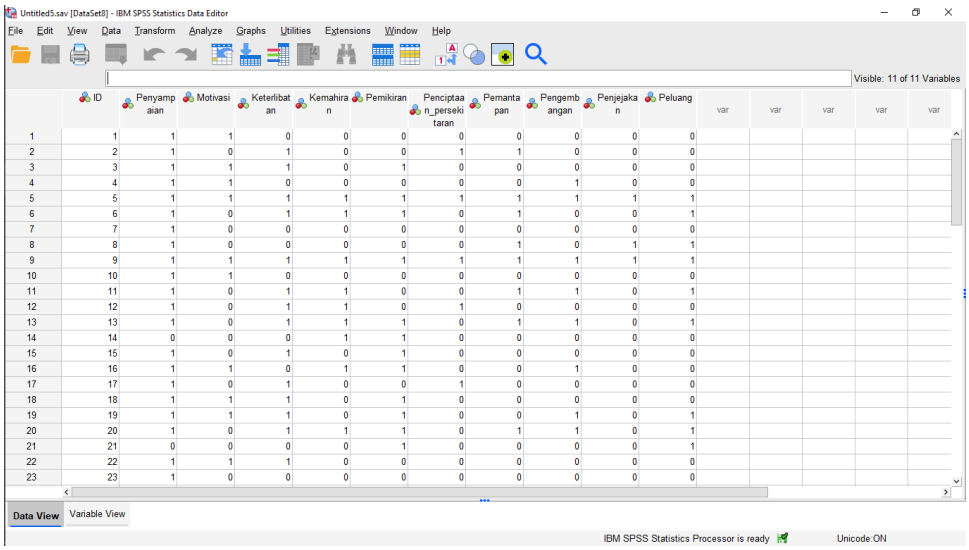

Figure 9: Data for Section C

Result and Discussion

Demographic Profiles of the Respondents

The demographic profile of the participants is summarised in Table 2. Males made up of 30% of secondary school's teachers, while females made up 70%. The most respondents come from Perlis (40%), Kedah (28%) and Selangor (14%).

The respondents are the secondary school teachers from several types of school such as National Secondary School, Religious Secondary School and MARA Junior Science College which contributes 74%, 8% and 6% respectively.

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The respondents are the secondary school teachers who have teaching experience from 13 years up to 37 years. Pure Science and Mathematics are the most popular subject that adapted gamification in teaching and learning followed by Social Science and Languages.

Table 2: Demographic Profile of the Respondents

Category	Number of sample (*n*) = 50	
	Frequency	**Percentage (%)**
Gender		
Male	15	30
Female	35	70
Age		
21-30 years old	4	8
31-40 years old	12	24
41-50 years old	21	42
51-60 ears old	13	26
More than 60 years old	0	0
States		
Perlis	20	40
Kedah	14	28
Pulau Pinang	2	4
Perak	1	2
Selangor	7	14
Negeri Sembilan	1	2
Melaka	0	0
Johor	0	0
Pahang	3	6
Terengganu	2	4
Kelantan	0	0
Sabah	0	0
Sarawak	0	0
Wilayah Persekutuan (KL/Putrajaya/Labuan)	0	0
Type of schools		
National Secondary School	37	74
Fully Residential School	0	0
Sports School	0	0
Religious Secondary School	4	8
MARA Junior Science College	3	6
Technical and Vocational School	2	4
Government Funded Religious School	0	0
Private/Independent Religious School	3	6
Vocational Special Education School	1	2

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Years of Teaching Experience		
1-10 years	6	12
11-20 years	23	46
21-30 years	20	40
More than 30 years	1	2
Area of Teaching		
Pure Science	5	10
Mathematics	5	10
Social Science	10	20
Language	10	20
Information Technology	1	2
Skills and Technicals	7	14
Agama dan Sivik	6	12
Sukan dan rekreasi	0	0
Pengajian Am	4	8
Business	1	2
Pendidikan Khas	1	2
Pendidikan Seni Visual	2	4
Sejarah	1	2
Maharat	1	2

Awareness and Knowledge of Gamification

The second part of the survey included questions about the awareness and knowledge of gamification in teaching and learning. In this part, the researchers designed the multiple-choice questions to find out the extent to which the secondary school teachers are aware and familiar with the concept of gamification in teaching and learning. The results are summarised in Table 3.

When asked about the awareness of gamification adaptation in teaching and learning process, most of the respondents (68%) aware about adapting gamification as one of the tools for teaching and learning. However, there are 66% of the respondents who are not applying the gamification during their teaching and learning session. This is due to the potential disadvantages of adapting gamification in teaching and learning. Student inequality, imbalance in learning mastery and uncertainty of effectiveness have become the most concerns disadvantages of adapting gamification in teaching and learning with the percentages of 44%, 42% and 38% respectively.

Despite the potential disadvantages of adapting gamification in teaching and learning, the respondents also agreed that there are a few potential advantages of adapting gamification in teaching and learning. Interactive and fun delivery of positive feedback, increased student engagement in learning, stimulates critical and analytical thinking and motivate students through rewards and achievements have become the highest picked with the percentages of 88%, 76%, 54% and 54% respectively.

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Table 3: The Awareness and Knowledge of Gamification

Category	Number of sample (*n*) = 50	
	Frequency	**Percentage (%)**
Awareness		
Yes	34	68
No	16	32
Application in Teaching and Learning		
Yes	17	34
No	33	66
Potential Advantages		
Interactive and fun delivery of positive feedback.	44	88
Motivate students through rewards and achievements.	27	54
Increased student engagement in learning.	38	76
Development of social skills and cooperation.	21	42
Stimulates critical and analytical thinking.	27	54
Creation of a step-by-step learning environment.	13	26
Knowledge consolidation through testing and feedback.	19	38
Development of problem-solving skills.	18	36
Track individual performance in more detail.	11	22
Repeatable learning opportunities for deep learning.	20	40
Potential Disadvantages		
The learning objectives are unclear.	9	18

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Complexity in implementation.	13	26
Uncertainty of effectiveness.	19	38
Student inequality.	22	44
Imbalance in learning mastery.	21	42
Adaptability in learning styles is different.	15	30
Ignoring the ethical and mental well-being aspects.	7	14
Dependence on rewards and achievements.	17	34
Learning distraction.	14	28
Potential for social segregation through a competition and ranking system.	17	34
Supportiveness		
Disagree	3	6
Uncertain	26	52
Agree	21	42

Mean, Standard Deviation, and Percentage Analysis

The mean, standard deviation values, and percentages of each component in the challenges of gamification adaptation in teaching and learning are shown in Table 4 and Figure 1, respectively.

This variable was assessed using 10 components. The mean value of all components is from 2.30 to 4.18, and the overall mean value is 3.566 with a 0.9251 standard deviation. The lack of training, inequality of access, limited time and limited digital sources, are among the highest mean value, with 3.76, 4.04, 4.12 and 4.18, respectively, compared to others. From Figure 1, we can see that 46% of the respondents are strongly agree that the limited digital sources will be the challenges of gamification adaptation in teaching and learning process. Followed by limited time, inequality of access and lack of training with the percentage of 40%, 30% and 24% respectively.

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Table 4: The Challenges of Adapting Gamification in Teaching and Learning

Components of The Challenges of Gamification Adaption in Teaching and Learning	Mean	Standard Deviation
Do not want changes	2.30	1.129
Lack of training	3.76	0.938
Limited digital sources	4.18	0.919
Limited time	4.12	0.918
Scepticism of the education's value	3.00	1.010
Inequality of access	4.04	0.807
Concerns about equity	3.50	0.931
Challenges of assessment method	3.46	0.952
Lack of customization	3.60	0.833
Potential disruption	3.70	0.814
Overall Value	**3.566**	**0.9251**

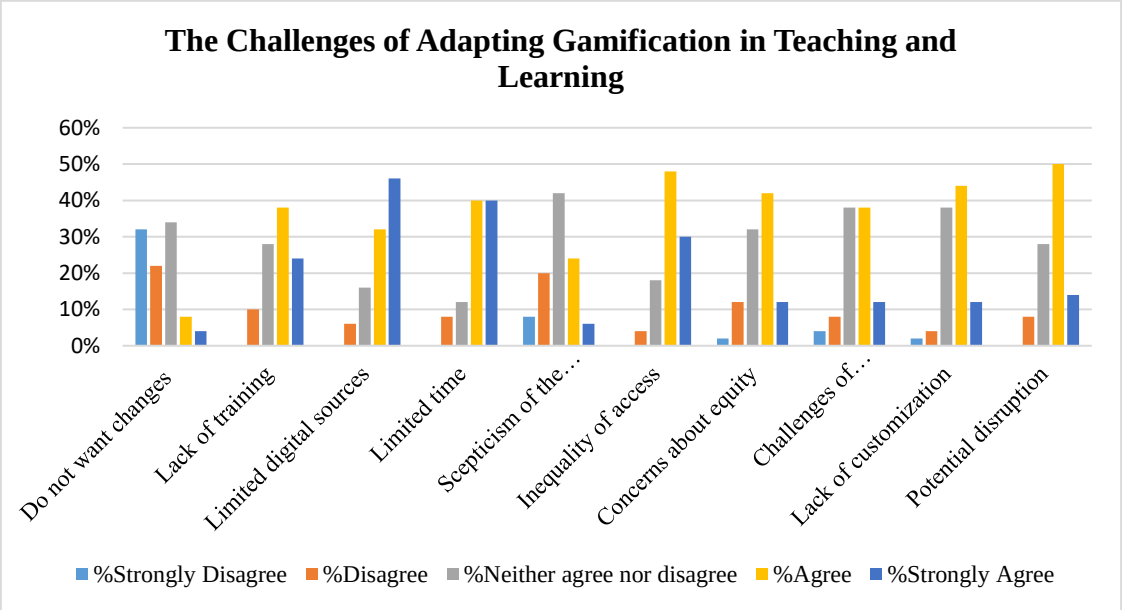

Figure 10: Percentage Components of The Challenges of Adapting Gamification in Teaching and Learning

Discussion

Based on the results in Table 3, findings revealed that most respondents had awareness and knowledge of gamification in teaching and learning. In this part, the researchers also can identify the potential advantages and disadvantages of adapting gamification as teaching and learning tools. Interactive and fun delivery of positive feedback, increased student engagement in learning, stimulates critical and analytical thinking and motivate students through rewards and achievements were the potential advantages of adapting gamification. These findings can be supported by the research conducted by Vrcelj et al. (2023), which stated that most of the respondents recognized the benefits of gamification, especially in terms of getting students' interest and become a great motivator for students to participate in classroom activities. The

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teachers also felt that by adapting gamification in teaching and learning could help them in making their subject more attractive to students and increase their engagement in learning.

Besides that, from these findings also the researchers can identify a few potential disadvantages of adapting gamification in teaching and learning which are student inequality, imbalance in learning mastery and uncertainty of effectiveness. These findings can be supported by the research conducted by Salam et al. (2023), which stated that the students' difficulties with their devices and internet access in this situation posed serious obstacles to their capacity to participate in online learning. It can be challenging for teachers and students to fully engage in digital learning activities when they lack access to dependable internet connections or functional equipment (Salam et al., 2023).

Based on the results in Table 4 shows that the mean for the challenges of adapting gamification in teaching and learning is 3.566 and the standard deviation is 0.9251. The results show that most respondents agreed about the challenges of adapting gamification in teaching and learning. The lack of training, inequality of access, limited time and limited digital sources, plays an essential role in the challenges of adapting gamification in teaching and learning as the percentages of the respondents who agreed has the highest percentages compared to another component. These findings can be supported by the research conducted by Salam et al. (2023), which stated that one of the biggest challenges the teachers faced was their own digital capabilities, and they recognised that they needed to improve their skills to be able to effectively teach their students using technologies.

Conclusion

This study is ongoing research on the adaptation of gamification in teaching and learning which aims to investigate the secondary school teachers awareness and knowledge about the use of gamification as one of the teaching and learning tools and also the challenges faced by the teachers in adapting gamification in teaching and learning. The results of this study revealed the extent to which the secondary school teachers are aware and familiar with the use of gamification in teaching and learning. The results showed that most teachers were highly aware and have knowledge about gamification in teaching and learning. Besides that, from this study also the researchers can identify the potential advantages and disadvantages of adapting gamification in teaching and learning. Student inequality, imbalance in learning mastery and uncertainty of effectiveness were the potential disadvantages while interactive and fun delivery of positive feedback, increased student engagement in learning, stimulates critical and analytical thinking and motivate students through rewards and achievements were the potential advantages of adapting gamification.

This study also descriptively presented the challenges of adapting gamification in teaching and learning among secondary schools in Malaysia. The results indicated that the lack of training, inequality of access, limited time and limited digital sources have become the main challenges of adapting gamification in teaching and learning. Based on these findings, the conclusion of the research suggests that further efforts are needed to improve their skills and knowledge with the concept and adaptation of gamification in teaching and learning. In order to improve the adaptation of gamification in teaching and learning, it could be beneficial to provide teachers with more resources, and training. This could enable teachers to better adapt gamification as one of the teaching and learning tools in the classroom, which would ultimately can lead to higher student engagement and better learning outcomes.

International Journal of Modern Education
IJMOE
EISSN: 2637-0905
Volume 6 Issue 23 (December 2024) PP. 613-629
DOI: 10.35631/IJMOE.623042

As with any study, it is important to acknowledge the limitations of the study. This study applied descriptive analysis in mean, standard deviation, and percentages on each component in each factor only. Thus, we aim to broaden the types of analyses, for instance, performing inferential analysis including correlation and regression analysis to dig up more detailed information on the collected data. Therefore, future research using more extensive samples should be conducted for a higher level of education and not only focus on the educators from school only but also from the educators of higher level such as matriculation and university. This in line with the encouragement from The Ministry of Education's to all educators to explore innovative approaches such as digital content development such as gamification in order to enhance student engagement and learning outcomes.

Acknowledgements

This research work is supported by Majlis Agama Islam dan Adat Istiadat Melayu Perlis (MAIPs) under the incentive of Short-Term Grant awarded by Kolej Universiti Islam Perlis (KUIPs).

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