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CHALLENGES AND GENDER DIFFERENCES IN IMPLEMENTING GAMIFICATION APPROACH AMONG VOCATIONAL COLLEGE LECTURERS IN MALAYSIA

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ABSTRACT

Background and Purpose: Gamification is a teaching and learning approach that is gaining popularity among teachers as a way to make classroom learning more enjoyable and engaging with the use of rewards to celebrate accomplishments. With the rise of online learning in Malaysian educational institutions, gamification is viewed as an interactive method of teaching and learning. Due to the fact that limited studies have been conducted to investigate the challenges in implementing gamification approaches among vocational instructors, it is the aim of this paper; therefore, to examine the challenges.

Methodology: This study employed a quantitative research method. The respondents include 55 vocational lecturers from several vocational colleges in Malaysia. A set of questionnaires was used to examine the challenges faced by the lecturers in the implementation of gamification at their institutions. Four constructs were used to differentiate the differences of the challenges, which include support, access, competency, and applicability. Data collected from this study were analyzed using descriptive statistics (mean score and standard deviation) and inferential statistics (independent sample t-test) to identify the differences between gender.

Findings: The findings of this study indicated that the majority of vocational lecturers have moderate challenges when implementing gamification approaches in their teaching and learning based on the findings related to the constructs. In addition, it was found that there were no significant gender differences in terms of the difficulties associated with implementing gamification approaches. This study also showed that most vocational lecturers have the potential to apply gamification in their teaching based on their high competencies with adequate support and enough access given to them.

Contributions: The findings of the study can contribute to vocational lecturers to promote gamification approach during the learning process to increase students' motivation.

Keywords: Gamification, gender, challenges, approach, vocational.

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1.0 INTRODUCTION

In addition to teachers' competence and the tools used to facilitate the learning process, students' interest and motivation play a crucial role in determining the efficacy of their learning. Nonetheless, there is a decline in interest and motivation among vocational students, which has impeded the teaching and learning process (Garcia-Iruela, Hijon-Neira, & Connolly, 2021). This is due to the fact that traditional teaching and learning strategies employed by vocational teachers are incapable of enhancing students' interest and motivation during the learning process. According to Lo and Hew (2020), traditional teaching and learning strategies are ineffective for increasing student motivation. Other than that, negative perceptions arise when students aren't engaged, yet research shows that the right kind of motivation may have a major, beneficial effect on student performance (Brewer & Burgess, 2005). There have been several studies focusing on motivation and interest in vocational education since 1990. A quick search of the Scopus database with the keywords Vocational, Teaching, Motivation, and Interest revealed an upward trend in related publications. From 1990 to 2022, a total of 1065 documents were published, with a noticeable increase beginning in 2000, as shown in Figure 1.

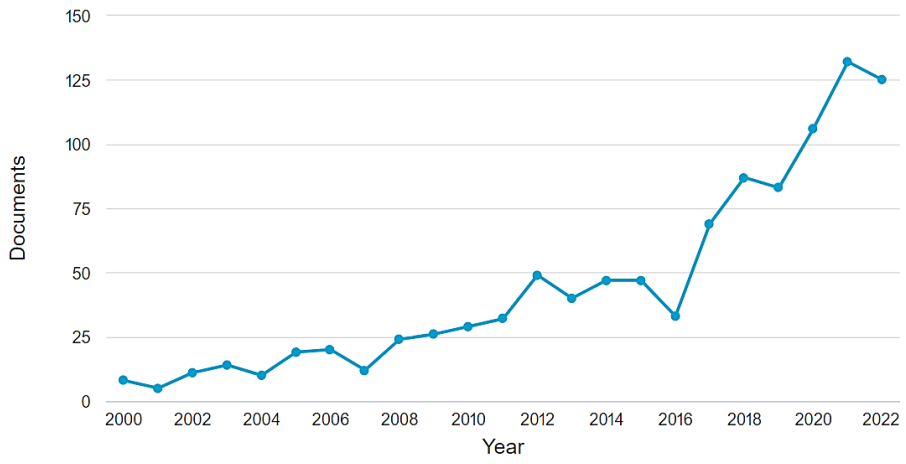

Figure 1: Publication trends

The increasing number on publication related to the motivation and interest in vocational teaching shows an increasing demand in identifying the cause and solution that exists in this field. Since it has become harder to engage children using conventional approaches, incorporating technology into education has become necessary. This is because, most children nowadays are exposed to technology from an early age and have become accustomed to the use of technology in their daily lives.

According to Drouin et al. (2020), children around the age of 13 to 18 has an increased used of technological gadget as reported by their parents. Children mostly play games on their phones, tablets, or computers at home during their free time. This is because game elements can make them feel rewarded and exciting. The use of game elements in non-recreational environments (gamification) during classroom for teaching and learning purpose may be a possible solution to increase their engagement during learning, since research indicates an improvement in user experience and engagement, with the possibilities of improved motivation and behavioral results when gamification is being implemented (Garcia-Iruela et al., 2021). In order to maintain the relevance of their lessons to students, teachers must leverage the interests and recent trends of the current generation.

Despite the fact that there are various studies highlighting the benefits of gamification in teaching and learning, the adoption of gamification in vocational education sectors is not well studied, especially in vocational colleges in Malaysia. This is notably the case in Malaysia. There is a continuing deficiency of effort on the part of teachers to acquire new skills and to integrate gamification into the teaching and learning processes they facilitate (Petrovych et al., 2023). Some teachers think that this approach is not important and efficient thus disapproving the needs to learn the skills. There are also issues where teachers do not have enough

information on gamification in order for them to be able to implement it in their classroom. In cases where teachers possess insufficient knowledge or expertise regarding certain competencies, they may experience a lack of confidence in their ability to effectively employ said competencies during instructional sessions, potentially resulting in fear over their capacity to execute them with proficiency.

Regarding this matter, it is imperative that teachers possess the necessary competencies and aptitudes to devise instructional materials that foster student learning, enabling learners to acquire knowledge through practical application. However, even with enough competencies, some teachers are still facing problems to implement gamification approaches in teaching and learning. As a result, the purpose of this study is to investigate the difficulties associated with the adoption of gamification in vocational colleges, as well as the differences in gender associated with acceptance of the implementation of gamification.

2.0 GAMIFICATION IN TEACHING AND LEARNING

Gamification is the use of game design features and techniques to encourage, reward, and engage people in the acquisition of new skills or the modification of their behaviour. The ultimate purpose of gamification is to align intrinsic and extrinsic motivation, hence stimulating students' commitment and motivating them to actively engage (Chans & Portuguez Castro, 2021). With gamification, it is expected that students will participate actively in classroom activities thus enhance their knowledge and understanding. A study conducted by Beemer et al. (2019) on 292 students in one elementary-middle school in Detroit, Michigan to identify their participation in the classroom activities shows a significant effect in increasing participation during classroom activity. Another study by Duggal, Gupta, and Singh (2021) also identified an increase participation and engagement among students when gamification is implemented in the classroom. This study is implemented on students from higher education which is different from the first reported study which indicates that students from different level of education could benefit from the use of gamification during learning process.

Gamification is gaining popularity in educational settings and contexts because it makes learning more pleasant and encourages students to be responsive to knowledge. In addition to enhancing the user experience and engagement, motivation, and behavioural results, it can lead to increased participation, long-term commitment, and student excellence (Garcia-Iruela et al., 2021). In addition, previous research has demonstrated that gamification can foster enthusiasm, provide instructors with feedback on students' performance, satisfy learners' need for

recognition, and encourage goal setting (Bai, Hew, & Huang, 2020). Gamification is implemented mostly due to its capac-ity to motivate and increase good behaviour.

Other than improving motivation and engagement during teaching and learning, there are other outcomes reported when using gamification in teaching and learning. The outcomes are described as affective outcomes (Li & Chu, 2021; Sailer & Sailer, 2021), cognitive outcomes (Martí-Parreño, Galbis-Córdova & Currás-Pérez, 2021; de Las Heras et al., 2021), behaviour outcomes (Toda et al., 2019; Zou, Huang, & Xie, 2021), student performance (Isabelle, 2020; Legaki et al., 2020) and other outcomes such as image, self-efficacy and sense of belonging (Aguiar-Castillo et al., 2021). Collectively, these studies suggest that gamification offers potential for enhancing self-efficacy, self-esteem, and a sense of belonging, as well as motivation, engagement, emotional, cognitive, behavioural, and academic outcomes among students. Moreover, it improves overall welfare and educational achievement when used in teaching and learning.

One of the studies that explored gamification in vocational teaching and learning is a study by Jayalath and Esichaikul (2022) where they found that the incorporation of gaming elements into the delivery of learning opportunities has been shown to increase motivation and engagement among students, leading to the successful development of de-sired skills. Another study by Öden, Bolat, & Goksu (2021) also found that there is a difference in students' attitude when they learned using gamification technique such as Kahoot. The studies showed that students show a decrease in anxiety when learning using gamification technique. This finding is parallel to a study by Wang and Tahir (2020), where it was found that gamification positively influenced exam anxiety. Anxiety is one of the concerns among students especially when there are assessments conducted by teachers in the classroom. Students tend to have fear of failure even though the assessment is just conducted to assess their level of understanding in the class-room. Gamification gives students the feeling of enjoyment replacing the fears they used to feel during assessment.

Aside from that, research conducted by Meng et al. (2019) also suggests a beneficial finding about the application of gamification in the teaching and learning of vocational subjects. Students who took part in the research described learning with gamification as having elements of joy, anticipation, and competitiveness, all of which can satisfy the psychological requirements of young people. Gamification has the potential to motivate the intended target group to engage in constructive conduct, elevate the learners' drive to collaborate, foster educational processes, and stimulate the students' problem solving skills.

3.0 METHODOLOGY

3.1 Research Design

Research design used in this study is quantitative research where a descriptive research design is chosen to obtain findings based on the aim of this study. Descriptive research design is chosen when the researcher wants to know what is the reality which involves objectivity and neutrality (Lans & Van der Voordt, 2002). The aim of this study is to examine the challenges faced by vocational college lecturers in implementing a gamification approach. Thus, a descriptive research design is the most appropriate approach to use in this study, since the study's objective is to only examine the challenges without seeking in-depth explanations for the findings.

3.2 Research Questions

The research question for this study is as follow:

a) What are the challenges faced by vocational lecturers in implementing gamification approaches in teaching and learning?
b) What is a difference in the challenges faced by male and female lecturers when implementing gamification approaches in teaching and learning?

3.3 Sampling

The population for this study is the lecturers at vocational colleges in the state of Johor. The sampling technique used in this study is simple random sampling. According to Singh and Singh (2003), simple random sampling is the simplest and most frequently used technique for sample selection, because it involves drawing the sample unit by unit with an equal probability of selection for each unit drawn. To ensure that all units in the population have equal rights, the researcher selected the respondents at random from the population of lecturers from 12 vocational colleges. The procedure entails writing the names of all vocational colleges in the population on individual pieces of paper and depositing them in a container. Following that, the researcher randomly selected the unit based on the number of samples required for this study. The selected unit served as the sample for this study. According to Krejcie and Morgan (1970) sampling table, this study requires a total of 48 respondents. As a result, the researcher chose 55 lecturers for this study, which is more than the required sample needed.

3.4 Hypothesis

This study aims to examine the differences between gender regarding the challenges on the implementation of gamification in vocational college. Thus, the null hypotheses in this study are as follow:

H_0= There are no statistically significant difference between gender on the challenges to implement gamification among vocational lecturers

3.5 Research Instruments

The instrument used in this study is in the form of a questionnaire. According to Udriyah, Tham, and Azam (2019), the questionnaire is a data collection tool that consists of a series of written questions that are given to respondents in order to elicit written responses. The questionnaire used in this study consists of four constructs which are competency, access, support and applicability. Each construct consists of several items used to measure the construct. Table 1 shows the item distribution for each con-struct.

Table 1: Item distribution for each construct

No.	Construct	No. of Items
1	Competency	5
2	Access	4
3	Support	4
4	Applicability	4

3.6 Data Analysis

The questionnaire was distributed to lecturers at vocational colleges in order to ascertain the difficulties associated with implementing gamification in the teaching and learning process. IBM SPSS version 27 was used to evaluate the data collected throughout the study. Descriptive statistics and inferential statis-tics are used to analyze the collected data. These findings are described using the mean and standard deviation. Before analyzing the data, the likert scale data were transformed to enable the researcher to use inferential statistics on the data collected. After identifying the mean in this study, it will be classified into levels using the mean interpretation table. For inferential statistics, the data were analyzed using an independent sample t-test to identify the gender differences on the challenges of the implementation of gamification in teaching and learning among vocational lecturers.

3.7 Mean Interpretation

Using the mean score obtained during data analysis, the mean score interpretation table is employed to determine the level of perception and readiness. The mean interpretation table used in this study is shown in Table 2.

Table 2: Mean interpretation (Harrel, 2017)

Level	Mean Score
High	3.68 – 5.00
Moderate	2.34 – 3.67
Low	1.00 – 2.33

4.0 ANALYSIS AND DISCUSSION

4.1 Descriptive Analysis on the Challenges to Implement Gamification Approach Among Vocational Lecturers

This study aims to identify the challenges among vocational college lecturers in implementing a gamification approach. The data collected was analyzed using descriptive statistics and presented in the form of mean, standard deviation, and level based on the items of each construct measured in the instrument. The findhings for descriptive statistics are as shown in table 3.

Table 3: Challenges to implement gamification among vocational lecturers

No.	Item	Mean Score (M)	Standard Deviation (SD)	Level
Construct 1: Competency				
1	Lack of references	3.31	1.332	Moderate
2	Difficult to determine an accurate answer.	3.05	1.297	Moderate
3	Difficult to implement in practical classes.	3.00	1.262	Moderate
4	Design is hard to understand and complicated to be developed.	2.96	.902	Moderate
5	Lack of experience to develop materials.	3.38	1.340	Moderate
Construct 2: Access				
6	Inadequate ICT tools.	3.40	1.116	Moderate
7	Limited internet access.	3.71	1.149	High
8	Software/applications on the internet need to be subscribe and costly.	3.78	.975	High
9	Limited access to smartphones/laptops among students.	3.67	1.156	Moderate
Construct 3: Support				
10	Lack of time to join courses/workshops.	3.67	.982	Moderate
11	Facing technical difficulties.	3.00	.770	Moderate
12	Lack of support from the college.	2.56	1.102	Moderate
13	Lack of technical tools.	2.73	1.178	Moderate
Construct 4: Applicability				
14	The frequent changes in the Vocational College Standard Curriculum (KSKV).	3.69	1.386	High
15	Classroom location is not suitable.	3.07	1.120	Moderate
16	Requires longer class time.	3.24	.881	Moderate
17	Lessons are mostly hands on.	3.71	1.149	High

Table 3 shows the findings for challenges to implement gamification in vocational college. The findings indicate a majority of items for all the constructs involved in this study is at moderate level. However, there are four items in the questionnaire which indicates a high level which is item 8, item 7, item 17 and item 14. Item 8 (Software/application in the internet need to be subscribe and costly) is the item with the highest mean (M=3.78, SD=.975) followed by item 7 (Limited internet access) with the second highest mean (M=3.71, SD=1.149) and item 17 (Lessons are mostly hands on) with the mean value M=3.71 (SD=1.149). Another item that

scored high is item 14 (The frequent changes in the Vocational College Standard Curriculum) with the mean value M=3.69 (SD=1.386).

Table 4: Average mean score for constructs on challenges to implement gamification

Constructs	Average Mean	Level
Competency	2.95	Moderate
Access	3.75	High
Support	3.21	Moderate
Applicability	3.34	Moderate

The findings suggest that the primary obstacle to the implementation of gamification among vocational lecturers in vocational college is the issue of access, as indicated by the mean score for constructs on challenges associated with its implementation. The main contributing factor to this phenomenon is the lack of internet connectivity in particular areas or educational institutions, which poses a significant obstacle to the development and the implementation of a gamified setting (Araújo & Carvalho, 2022). Other than that, researchers have identified impediments such as time, limited resources and inadequate technical assistance as challenges to the successful integration of technology in educational settings (Alenezi, 2017). The results demonstrate that the mean scores for applicability and support are moderately high (applicability = 3.34; support = 3.21) in comparison to access (M = 3.75), as indicated by the findings.

Gamification is an interactive learning environment that has the potential to enhance various aspects of the learning experience for students. The implementation of gamification in educational settings has been found to have positive effects on various aspects of student development, including self-efficacy, self-esteem, sense of belonging, motivation, engagement, emotional regulation, cognitive abilities, behavioural outcomes, and academic achievement. Alzahrani and Alhalafawy (2022) suggests that gamification has the potential to facilitate the attainment of educational objectives, assess learners' areas of proficiency and deficiency, enhance student learning, and foster student motivation towards learning. Additionally, the authors note that learners' receptiveness to the gamification approach and its capacity to encourage student engagement in the educational process are noteworthy. Gil-Aciron (2022) underscores the advantages of incorporating gamification in educational settings, such as providing regular and tailored feedback, fostering social learning, and enhancing student motivation. Although prior research has identified numerous benefits

associated with gamification, its successful implementation necessitates adequate support, accessibility, competency, and the capacity to discern its applicability based on the subject matter.

The findings of the study revealed a significant challenge in the incorporation of gamification, namely, accessibility. The term "access" in this study pertains to the level of access that instructors possess with regards to information and communication technology (ICT) tools, internet connectivity, the gamification application that is accessible, and electronic devices such as smartphones and laptops. The aforementioned forms of access can also be classified as environmental resources. Studies have indicated that developing countries encounter challenges such as inadequate computer availability, substandard internet connectivity in terms of coverage and speed, limited classroom space, insufficient technical support, restricted internet settings, and low-specification computers in educational institutions (Alalwan et al., 2020). A further investigation has identified 43 factors that may impact the integration of ICT-centered approaches in educational institutions situated in developing countries. One of the factors that has been identified is infrastructure, as reported in (Tokareva, Smirnova, & Orchakova, 2019). Insufficient financial resources constitute a significant impediment for educators to effectively integrate gamification into their instructional practises (Alzahrani & Alhalafawy, 2023). Typically, educational establishments provide access to applications given by the Ministry of Education. However, in order to utilise alternative interactive gamification tools, teachers must independently subscribe each application. In addition, teachers encounter the challenge of stu-dents' insufficient possession of personal electronic devices and limitations on bringing such devices to school (Alzahrani & Alhalafawy, 2023). The solution of accessibility issues is a prerequisite for enabling increased teacher access and more active implementation of gamification approaches.

This study has identified additional challenges, namely competency, support, and applicability. The moderate level of challenges for all the other constructs suggests that vocational lecturers encounter fewer difficulties in implementing gamification in the classroom with regards to these constructs compare to the first construct which is access. The term "competency" in this study refers to the skills of vocational lecturers in utilising gamification approaches. As per the findings of the study by Omar, Farzeeha, and Saari (2022), the ICT skills possessed by vocational lecturers are reported to be at moderate level. This can be attributed to the fact that a majority of the lecturers in vocational colleges are veteran lecturers who may not have acquired proficiency in the field of information and communication technology. One of the factors that contribute to the lack of competency among vocational

lecturers is their preference for conventional teaching methods as opposed to technology-based methods (Yeap, Suhaimi, & Nasir, 2021). Most veteran lecturers may be accustomed to utilising non-technological methods, which could result in a lack of awareness regarding the significance of incorporating new technological approaches and a lack of familiarity with the needs of younger generations.

Other than that, institutional support plays a crucial role in the effective implementation of gamification as a pedagogical tool. The implementation of gamification in educational settings necessitates consideration of the costs incurred. These costs may range from individual costs, such as the time and effort required to prepare new teaching materials, to institutional costs, such as the acquisition of new equipment like digital blackboards or computers (Sánchez-Mena & Martí-Parreño, 2017). The provision of support for institutional costs in Malaysia necessitates the involvement of higher management entities, such as the Ministry of Education. In addition to financial considerations, workshops and training are also regarded as a form of support for enhancing individuals' competencies. The responsibility of providing training opportunities and professional development programmes for teachers to improve their skills and competencies also falls upon the institutions and Ministry of Education, as stated in reference (Omar & Ismail, 2020). Given sufficient resources in the form of infrastructure and professional development, a greater number of teachers will be capable of integrating an interactive pedagogical approach within their instructional setting.

The last challenges identified in this study is applicability. According to a study conducted by Sánchez-Mena and Martí-Parreño (2017), teachers have expressed a significant concern regarding the compatibility of gamification with their respective subjects. The study suggests that certain subjects may be more conducive to gamification than others. Vocational lecturers, whose syllabus primarily involve practical applications, may perceive gamification as unnecessary given the subject matter. Teachers frequently strive to ensure that game-based learning activities align with their instructional curriculum during lesson planning (Emin-Martinez & Ney, 2013), which may explain the limited adoption of gamification. The present scenario necessitates the dissemination of knowledge among teachers regarding the implementation of gamification across diverse academic disciplines.

4.2 Gender Differences on the Challenges to Implement Gamification Approach among Vocational Lecturers

The findings for inferential statistics using independent sample t-test are as shown in table 5 and 6.

Table 5: Independent sample t-test

	Gender	N	Mean	Standard Deviation	Standard Error Mean
Challenges	Male	20	3.4441	.74222	.16597
	Female	35	3.2034	.75403	.12745

The findings of mean value and standard deviation between male and female on the challenges to implement gamification among vocational lecturers indicates a small difference between male lecturers (M = 3.4441, SD = 0.74222) and female lecturers (M = 3.2034, SD = 0.75403). Table 6 shows the independent sample t-test for gender differences on the challenges to implement gamification approach among vocational lecturers.

Table 6: Independent sample t-test

	t-test For Equality of Means						
	t	df	Sig. (2-Tailed)	Mean Difference	Standard Error Difference	95% Confidence Interval of The Difference	
						Lower	Upper
Challenges	1.145	53	.257	.24076	.21018	-.18081	.66232

Table 5 indicates that the findings demonstrate no statistically significant differences between genders in relation to the challenges faced when implementing gamification in educational settings (M = 0.24076, p = 0.257 >0.05). This result indicates that the null hypothesis failed to be rejected by the researcher. The aforementioned deduction aligns with the outcomes of a research conducted by Martí-Parreño, Seguí-Mas, and Seguí-Mas (2016), which revealed that the use of gamification remains relatively consistent across different age groups and genders. Nevertheless, the research suggests that there exists a notable gap in the attitudes of teachers depending on the academic institutions to which they belong. Although both studies suggest that gender does not have a significant impact on the implementation of gamification, Bernik, Vusic, and Milkovic (2019) discovered contrasting results. According to the findings of the research, male lecturers exhibit a greater inclination towards the utilisation of gamification methods in their teaching practises and encounter comparatively fewer obstacles in incorporating it within the classroom setting as compared to their female colleagues. This

phenomenon can be attributed to the fact that males tend to exhibit greater participation in gaming pursuits compared to their female counterparts.

An additional finding made in this research pertains to the gender differences observed in the challenges encountered by teachers when incorporating gamification into their teaching practises. The results indicate that there are not any statistically significant differences between male and female teachers in terms of their ability to incorporate gamification into their teaching practises, suggesting that both genders face comparable difficulties in this regard. The study conducted by Gómez-Carrasco et al. (2019) observed that males exhibit a higher level of proficiency in technical aspects of information and communication technology (ICT), while females tend to utilise ICT tools for personal gain to a greater extent. Over time, the gap in technical proficiency between genders has begun to narrow. A prior investigation has also revealed that there are no discernible differences in the acquisition of information and communication technology competencies based on gender (Gómez-Carrasco et al., 2020). The increasing use of technology and the widespread accessibility of online re-sources have facilitated the enhancement of skill sets for individuals irrespective of their gender. Therefore, the acquisition of gamification skills can be facilitated by appropriate motivation and interest among teachers.

5.0 RECOMMENDATIONS FOR FUTURE WORK

The objective of this study is to examine the challenges faced by lecturers in vocational colleges when incorporating gamification into their pedagogical practises. Notwithstanding, diverse individuals may encounter distinct challenges when engaged in the process of teaching and learning, which may be attributed to factors such as their level of education and prior teaching experience. The present study does not comprehensively address all the facets mentioned and primarily delineates the challenges solely on the basis of the data gathered from all the entities encompassed in the present study. The researcher suggests conducting a comprehensive investigation pertaining to the aforementioned aspects, with the aim of thoroughly examining the challenges associated with the integration of gamification in the vocational college in Malaysia.

6.0 CONCLUSION

There is a growing interest among teachers regarding the potential of gamification as a strategy to enhance student engagement and academic performance within the classroom setting. Contemporary teachers are presently equipped with a diverse range of gamification tools and

strategies, enabling them to select the most suitable option for their instructional settings. Despite the existence of diverse gamification tools, vocational lecturers continue to rely on traditional teaching methods within their instructional settings. Based on the results obtained, it can be inferred that resolving access-related concerns is imperative to motivate and empower a greater number of vocational lecturers to incorporate gamification into their teaching practises. In order to proficiently execute the technique, it is imperative to have access to information and communication technology (ICT) tools and the internet. Furthermore, it is essential for educational institutions to provide lecturers with the necessary tools to further develop their pedagogical and didactic approaches in alignment with the demands of today's society and the younger generations.

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