A Gamified Classroom with Technical and Vocational Education and Training (TVET) Students using Quizziz

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Abstract

Education has been evolving in the past centuries and it is taking a gradual change in the education industry. In meeting the needs and the changing behavior of the current students, mobile devices and technologies have been the important element in education. The current study has implemented a gamification web application (Quizziz) into two groups of Technical and Vocational Education and Training (TVET) students, and also to observe their engagement and eventually their quiz results for Human Computer Interaction (HCI) subject for five lectures were recorded. In total, 47 students were participated in this study. The lecturer gave short lectures to students beforehand and followed by giving them simple quizzes through Quizziz. With leaderboard and points as a gamification benchmark, the performance of the students was tracked for 4 class session to evaluate the effectiveness of gamified classroom.

1.0 Introduction

ICT learning has been evolving and advancing the society. Educators should focus on demonstrating the use of ICT tools and establishing the best resource for producing better outcomes in students' learning [1]. Engaging students in learning is a crucial part of teaching processes in classrooms. Quizziz, which is an education app, has been selected in this study as a tool for teaching and to make the classroom "fun" by gamifying traditional quizzes. There are some previous studies that applied Quizziz in classroom and examined the effectiveness in teaching and learning, but there are yet study to examine the use of this approach in vocational education for HCI subject. This research is to study the effectiveness of a gamified classroom through Quizziz and the target was the final year TVET students that is ranging between 19 to 21 years old.

Besides, Quizziz is a game-based educational app, implementation of HCI quiz questions in Quizziz also able to cultivate the students' understanding of the app in a HCI perspective. In a gamification context, this research is to benchmark the students through points and ranking, that eventually drive students to complete the quiz.

One biweekly and four weekly sessions of quizzes were given to two groups of students respectively to test their understanding on each HCI class. Result of each week was gathered and monitored to evaluate the effectiveness of the gamified classroom.

1.1 Quizziz

Quizizz is a gamification educational app that helps students to have a game-like multiplayer class activities [6]. [14] had examined that the Quizziz learning tools could bring positive impact on the students' learning journey. It will generate satisfaction among students after using it [6]. With characteristics like levels, leaderboard, music, themes and friendly interfaces, Quizziz is a potential tool to draw attention of the students and interact with their classmates effectively [2].

[7] reported that students were more interested and less distracted to the given quizzes when using Quizizz. This is due to the interface of Quizizz, which can offer the real game environment in a classroom. Thus, students are more focused and they have more fun using it. Based on [7], Quizziz was accepted by students as a tool for class activity as compared to Kahoot, which is also a similar educational app with gamified features.

1.2 Gamification on TVET students

Technical and Vocational Education and Training (commonly also known as TVET) is an education to prepare young people with sufficient knowledge and skills for their technical career. It is also known as workforce education or workplace education [6]. Research has been carried out to investigate the influences of gamification among TVET students [6].

Quizizz had applied to several level of studies. For example, [11] highlights that the effectiveness of using Quizizz in the Arabic classroom among degree students in Sultan Idris Education University Malaysia. This paper showed that students have a positive learning experience using Quizizz.

Gamification has been known as the utilisation of game design elements in non-game contexts [8]. It has been applied in various areas and in recent years, and also human-computer interaction (HCI) education [8]. Game design such as leaderboard and points are factors for engagement and motivation in education and it is often been researched to increase students' motivation [9].

Traditional teaching should be innovated with the use of technological tools and to enhance the effectiveness of traditional education [10]. Therefore, game based platform was introduced to suit and innovate the teaching syllabus. [14] had reported that by using gamification concept such as Kahoot, a game based platform among vocational students were observed to be effective as this approach was less stressful (more fun) for them.

[13] also stated that students who are not interest in academic may learn some skills for their future career. Nevertheless, the technology nowadays has been an essential tool for daily life. By gamify the usage of technology, it is believed to bring lots of fun and benefits to students' daily life. There are many challenges in teaching vocational skills to students. Study [2] has reported that using Quizizz was able to enhance students' learning, as well as to reduce test anxiety and stress; students wanted to engage more in the class but not under the test environment. From the research of [14], students were impressed and show concentration in teaching and learning process when using gamification [12].

2.0 Research design

Students of two groups, group A (23 students) and group B (24 students) were given a short Quizziz test on five classes that lasted for one month. Students were to follow the basic rules of Quizziz in order to motivate the learning process of the students as stated by [2]. The Quizziz results of the two groups were compared in order to identify the two groups' class average score with the same quiz rules and teachings, as the two similar groups of students have been following the same course syllabus from first year up until second year (final year) throughout their TVET studies, they have gone through the same TVET experience together while they never study together in the same class before, comparing the two groups able to classifying students' score who are below 50% or above 80%, [15] states that comparing and identifying are cognitive based on characteristics like attribute, properties or scores and through the feedback to evaluate the engagement of students in class. For the first quiz, students tried it in the first lecture as a trial; after that, they took the first quiz on the second week of lecture, then from third week onwards,

students took their quizes weekly. At the end of the quiz session on week 5, the students were asked to provide their respective feedbacks on their Quizziz sessions.

The difficulty of the quizzes for this 4 quizzes are from 12th grade to university level, as minimum age of TVET student is 16 years old [13] and 12th grade is equivalent to 16 or 17 years old, the difficulty of the quiz was starting from 12th grade. With objective questions of 4 options, the level of difficulty was gradually increasing from week 1 to week 5, as to benchmark students score, student's performance according to difficulty is examined. Week 1 and 2 are mainly about interaction design - 12th grade equivalent to 16-18 years old,. week 3 was about computer devices with human interaction - University level equivalent to 19 years old, week 4 was psychological and cognitive learning – University level equivalent to 19 years old, and week 5 was the principal of design - University level equivalent to 20 years old.
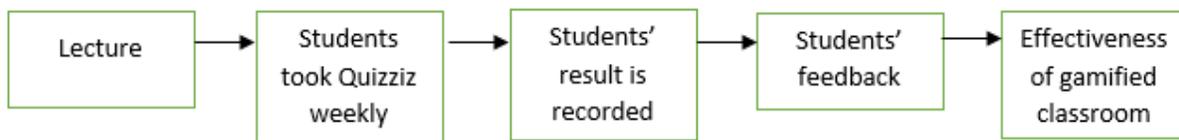

Figure 1: Research design flow

3.0 Results

Table 1 and Table 2 show the Quiz results of the students for the past five weeks with Quizziz. There were 1 bi-weekly quiz and 3 weekly quiz; each quiz shows the accuracy scores, which is the score of the students, based on their time and correctness of the questions; number of students who scored above 80% and below 50%. The overall average of quiz accuracy scored are calculated.

Table 1: The accuracy, students score above 80 and student score below 50 of group A

Week	Quiz	Accuracy (score)	No of students who scored above 80%	No of students who scored below 50%
Week 1 and 2	1	61%	3/24	4/24
Week 3	2	83%	22/24	0/24
Week 4	3	63%	12/24	7/24
Week 5	4	67%	9/24	0/24
Average		68.5		

Table 2: The accuracy, students score above 80 and student score below 50 of group B

Week	Quiz	Accuracy	Students' score (above 80)	Students' score (below 50)
Week 1 and 2	1	89%	22/23	1/23
Week 3	2	81%	12/23	0/23
Week 4	3	84%	18/23	2/23
Week 5	4	86%	22/23	1/23

		Average	85		

From the results, students of group A has an average score of 68.5% and group B is 85%. It has a difference of 16.5, group A has a lesser number of students achieved 80% than group B. While group B has achieve more than 50% a class to get 80% above in every quizzes. However, from the table above, students who score lesser than 50% are in between 0 to 7, this number is below 30% of students in a class. From the results, over 70% of the students were able to answer the questions and reached a passing score of 50% above. It shows Quizziz able to engage students to answer and finish the quiz with a minimum failure rate of lesser than 50 %.

To examine students engagement, open feedbacks from students were gathered to understand their views on this learning method. 15 feedback statements were collected from the students and they were listed in Table 3.

Table 3: 15 Feedback statements from students that experienced Quizizz in both group A and group B.

I think this is a great tool for learning and study, it makes things fun and engaging.
Quizziz able to make students compete and push them to answer with what they could in a certain time.
I like the multiplayer joining in a classroom, just like a game, enter a game lobby before game starts.
I like Quizziz that has great features that can review the past record and email to parents.
I like Quizziz because this is a very good tool for us to compete in quiz and the real-time leaderboard is very motivating.
I like Quizizz because it changes things up in class, and makes it more fun to learn the material.
This is no boring sessions that write on paper, it is an interactive and fun classroom activity.
It has music and timing that create sense of urgency

I like the leaderboard that is a driving force for us.
I like that it makes you want to be competitive and be at the top of the leaderboard. I liked the live leaderboard because
Quizziz kept me focused in answering the questions.
Quizziz makes students learn effectively as the sessions are fun and game-like design makes us happy to learn.
I think Quizizz is fun and engaging for learning, especially its nice interface.
I like Quizziz as a tool of learning as it motivates students to answer and it has random generated questions for each individual student, hard to copy and cheat.
I feel happy, tension but at the same time satisfied if my answer is correct.

In Table 3, students were satisfied with the outcome of Quizziz and it gave a fun and urgency for students to complete and learn from the questions. This effect is mainly due to the time limitation and also leaderboard presented to them during their quizzes. This observation was also reported in the same case as of another study conducted by [2] as these features make students motivated and performed better in their quizzes despite the difficulties.

Besides, the students have demonstrated their progress in a positive manner, such as fun and engaging, competitive, focused, happy and driving force that intrinsically motivated the student. Also, this gamification environment of Quizziz is closely related to the psychological needs of young generation who are more familiar with the gaming environment [4]. This environment is believed to be a great potential in learning design for fun and multiplayer class activities.

4.0 Conclusions

Using ICT has the potential to generate the dynamic of learning, especially when ICT is able to support the gamification factors like engagement, achievement ranking, points and leveling up. As shown in the result, the students attracted to the leaderboard and points features offered in the game environment. It motivates students to continually learnt and engaged in their studies. By taking quizes with Quizziz, especially in HCI topics, students are able to provide HCI related feedback based on what they have learnt in class.

Although there are some differences on Group A and Group B average scores, but from the feedback itself, the results are consistent for both groups. At this point, the research is able to identify the motivation of the TVET students while using Quizziz in game based quiz environment; a more in-depth study on gamification will be done in the future.

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