Implementation of The Gamification Concept Using KAHOOT! Among TVET Students: An Observation

M E Ismail, N Sa’adan, M A Samsudin, N Hamzah, N Razali and I I Mahazir

Faculty of Technical & Vocational Education, Universiti Tun Hussein Onn Malaysia, Batu Pahat, Johor, Malaysia. 
Academi of Language Studies, Universiti Teknologi MARA, Pasir Gudang Campus, Johor, Malaysia. 
School of Educational Studies, Universiti Sains Malaysia, Penang, Malaysia.

E-mail: erfy@uthm.edu.my

Abstract. 21st century way of learning is one of the transformations lauded by the Ministry of Education Malaysia in the Malaysian Education Blueprint (2013-2015) to equip students with communication skills, critical thinking and collaboration or recognized as Higher Order Thinking Skills (HOTS). This 21st century learning requires suitable teaching aids to achieve the learning objectives. The gamification approach in teaching and learning is considered as one of the new method that is capable in raising students’ achievement. This study was conducted to identify students’ attitudes, motivations and perceptions on early exposure to gamification through the Kahoot! usage. The population of the study involved 65 students of Machining Industry Programme at Sultan Haji Ahmad Shah Vocational College (KV SHAS). The sampling method used is a purposive sampling focusing on 20 students from third year students of Machining Industry Programme. Questionnaire was used in this study and the data were collected and analysed using Statistical Package for Social Science (SPSS) version 24.0. Based on the analysis, the Cronbach Alpha value of the instrument is 0.80 and shows that the reliability of the instrument is at a high level. The result of the study found that application of gamification concept using Kahoot! is well received in terms of attitude (M=2.88), motivation (M=2.89) and students’ perception (M=2.92). This indicates that the gamification implementation concepts using the Kahoot platform! as a teaching aid is well accepted by the vocational college students.

1. Introduction

21st Century Learning is one of the transformations introduced by the Ministry of Education Malaysia in the Malaysian Education Blueprint (2013-2015) to produce students with communication skills, critical thinking and collaboration or recognized as Higher Order Thinking Skills (HOTS). This 21st century learning requires effective teaching aids in order to achieve this learning target. Learning objectives achieved through the use of these tools must demonstrate the achievement of elements of technical skills related to material content and skills of the 21st century, especially for vocational education graduates as the basis for working skills in the industry [1]. This gamification approach to
education is considered as one of the new teaching era that is capable in improving students’ achievement.

One of the main factors affecting students’ achievement is attitude. Besides, attitude has a close relationship with one’s achievement in his learning. According to [2] attitude is an abstract and only visible from the action taken. In the learning where gamification is incorporated, attitude affects the extent to which learners can learn and master them quickly [3]. Self-factor is the factor that most influence someone to learn something new if the student has a positive attitude such as awareness of the importance of a subject being studied. According to [4], attitude is one of the components in the motivational construct but differences in factor composition.

With the motivation, students will learn harder, diligently and fully concentrated in the learning process. Motivation in learning is one of the things that need to be highlighted in school learning efforts [5]. Motivation is also a stimulus involving the process of generating, retaining and controlling interest [6]. Highly motivated students usually have a strong and steady impetus to continue to be interested in what is being presented as a result of strong stimulus through incentives and motives. Incentives in teaching and learning are often presented in extrinsic form such as scores, grades, money, praise, appreciation, star sign, etc. [7]. Thus, as a teacher, it is best to choose teaching and learning materials, teaching methods and techniques that meet the needs and interests of their students [6].

Teaching through gamification is a student-centered approach where the student will be more independent while the teacher will only act as a guide for knowledge and not the conveyor of knowledge. [8] claimed that gamification-based teaching methods are capable of replacing conventional methods in a variety of ways, especially in a normal classroom environment. In the study by [9] teachers should choose the teaching approaches that can involve students actively and effectively in learning. This teaching approach allows students to use imagination and thinking skills in making decisions and learners can also experience new experiences in their learning. This study intends to see the influence of student perceptions, attitude and motivation towards gamification in learning. In addition, this study also wanted to identify the factors that influence the students in using gamification in learning and to examine the extent to which these factors influence the acceptance of students towards gamification in learning and further explore how these methods help solve problems arising from conventional learning.

1.1. Problem background

Gan, Menkhoff and Smith [10] stated that teaching and learning process is supposed to be fun and challenging experience for every student. Teachers should be wise to use today’s technology to make a difference in teaching and learning in the classroom [11]. Apart from perception, motivation is also an important component in learning successfully. This statement is supported by the study done by [12] where students that have negative attitudes toward learning will result in negative outcome of their academic achievement. [13] state that attitude not only affects the knowledge but also affects the effort that will determine the extent to which success can be achieved.

[14] finds that attitude towards teachers will also influence attitude and effort towards the success of students. According to [15] negative attitudes such as feelings of hate towards teachers can weaken the attitude and motivation of students in the subjects taught by the teacher. Some teachers use force in learning to make students frightened but such a thing makes the students feel anxious and start not interested in attending classes [16]. Students who have negative attitudes are more likely to dropout in learning [17] where negative and indifferent attitudes towards a subject will indirectly affect the students’ achievement. Attitudes, motivations, and perceptions of students are important components that must be emphasized in developing teaching aids.
Mayer (2014) [18] revealed that students’ motivation for learning may be weak. To make it worst, this weak motivation or lack of learning motivation will therefore weaken the activity and the quality of learning achievement may be affected. [19] stated that students are less motivated in gamification method because they are not ready with this method. This is because previous learning experiences like traditional methods are different and fail to provide students with fresh new methods such as gamification in learning. In addition, gamification can also create anxiety and affect students' motivation because the learning process can be disruptive because it is more student-centered. [20] finds a mixed feeling in students’ motivation towards gamification in learning due to independent learning and power struggle within the group. Motivation of a student is influenced by perception, so perception is an important element in determining student success. Each student has certain negative perceptions of a difficult and abstract subject will contribute to negative behaviour while learning the subject [21]. [22] study found that the problems faced by students were less interest and fearless on exploring gamification. Learning through gamification is possibly will produce a group of students who have no respect for teachers because lack of face to face interaction between the students and the teachers [23]. Students will feel humbled and fearless to make mistakes because they think their friends will laugh at their mistakes [24].

Teaching based solely referring to the books seen fail to attract the students’ interest in learning. However, traditional teaching methods are no longer suitable these days. Therefore, every educator should practice effective teaching methods to produce optimum outcomes. The success of a student lies in the way of teaching. Thus, it is important for teachers to study appropriate teaching methods that suit with the targeted students.

2. Methodology

This study is a quantitative study through a survey conducted at KVSHAS in Pahang, Malaysia. The results of the study were reported descriptively to describe the findings. The questionnaire was used as a research instrument to examine the attitude, motivation and students’ perception in the context of learning.

2.1. Sample of study

Besides that, the population of the study involved 65 students of Machining Industry Programme at Sultan Haji Ahmad Shah Vocational College (KV SHAS). Then, the sampling method used is a purposive sampling focusing on 20 students from third year students of Machining Industry Programme.

2.2. Instrument of Study

Instrument used in this study was a questionnaire. The questionnaire consists of 3 parts which are Part A, B, C and D. Part A is the respondent's demographic data. The researchers used average mean from descriptive statistical analysis. Meanwhile, Part B, Part C and Part D comprising the components of respondents' attitude, motivation and students’ perception toward gamification in learning. In addition, the reliability of the instrument was analyzed based on Alpha Cronbach value of 0.80 which shows the items in the questionnaires have high reliability.
3. Result

In this study, data obtained from the questionnaire were analysed using the Statistical Packages for Social Science for Windows Version 24.0 (SPSS V24.0). Level of readiness among respondents is measured based on the mean score interpretation [25] as shown in Table 1.

Table 1. Mean Score Interpretation

| Mean Score Range | Interpretation |
|------------------|----------------|
| 1.00 – 2.00      | Low            |
| 2.01 – 3.00      | Medium         |
| 3.01 – 4.00      | High           |

The results obtained from Part B, Part C and Part D are shown in mean and standard deviation table. Mean score is used to indicate the readiness level of respondents’ attitude, motivation and students’ perception toward gamification in the context of learning.

3.1. Students’ attitude toward gamification

In Part B the questionnaire instrument has seven questions regarding attitudes and results obtained shown in Table 2. The highest mean value for the attitude construct is 3.00 on B2 item; "I am fully concentrated in the teaching and learning process that incorporate gamification” and the lowest standard deviation is 0.894. The minimum value min as well as the highest standard deviation is 2.76 and 1.179 on B7 item; "Gamification makes me not stressed to learn a lesson".

Table 2. Mean value and standard deviation for constructing student attitudes towards gamification

| No. | Item                                                                 | Mean | Standard Deviation |
|-----|---------------------------------------------------------------------|------|--------------------|
| B1  | I’m interested in attending classes that use gamification in the teaching and learning process | 2.95 | 1.024              |
| B2  | I am fully concentrated in the teaching and learning process that incorporate gamification | 3.00 | 0.894              |
| B3  | I like to stand out while learning using gamification method.        | 2.95 | 1.024              |
| B4  | I appreciate the teachers who incorporate gamification during the teaching and learning process. | 2.81 | 1.030              |
| B5  | I focused when teaching and learning using the gamification method. | 2.81 | 1.108              |
| B6  | I respond positively when the teaching and learning process using gamification is executed. | 2.86 | 1.062              |
| B7  | Gamification makes me not stressed to learn a lesson.               | 2.76 | 1.179              |

3.2. Students’ motivation toward gamification

In Part C, there are seven questions related to motivation and results obtained are shown in Table 3. The highest mean value for attitude constructs is 3.19 on C6 item; "I like teachers who incorporate gamification in teaching aid " and the lowest standard deviation is 0.814. The lowest mean score is 2.71 on C4 item; "I feel challenged by the rank of friends who scored high in gamification during the teaching and learning process." and C5, "I am excited to practice gamification because of its creative learning content.". Although the lowest mean value in attitude constructs, however the C4 and C5
questions of the standard deviation values vary from 1.102 and 1.231. This mean value is still at average in mean interpretation.

**Table 3. Mean value and standard deviation for students' motivation towards gamification**

| No. | Item                                                                                           | Mean | Standard Deviation |
|-----|-------------------------------------------------------------------------------------------------|------|--------------------|
| C1  | I like to learn using gamification as it is challenging.                                       | 3.05 | 1.024              |
| C2  | I am happy to compete with my colleagues during gamification in the classroom.                  | 2.86 | 1.062              |
| C3  | I feel appreciated with the display of the available gamification marks.                        | 2.81 | 0.981              |
| C4  | I feel challenged by the rank of friends who scored high in gamification during the teaching and learning process. | 2.71 | 1.102              |
| C5  | I am excited to practice gamification because of its creative learning content.                 | 2.71 | 1.231              |
| C6  | I like teachers who incorporate gamification in teaching aid.                                   | 3.19 | 0.814              |
| C7  | I involved in gamification to gain high marks.                                                 | 2.90 | 1.179              |

3.3. Students' motivation toward gamification

In Part D, there are seven questions pertaining to perception and the results obtained are shown in Table 4. The highest mean value for attitude constructs is 3.19 in question D1, "I understand clearer on the content of learning by using gamification." and the lowest standard deviation is 0.918. The minimum value of min and the highest standard deviation are 2.76 and 1.136 in D2, "I was given the opportunity to explore learning using gamification on my own.” Although this mean value is lowest in attitude constructs, however, the D2 question is still at a moderate level in mean interpretation.

**Table 4. Mean value and standard deviation for students' perception toward gamification**

| No | Item                                                                                           | Mean | Standard Deviation |
|----|-------------------------------------------------------------------------------------------------|------|--------------------|
| D1 | I understand clearer on the content of learning by using gamification.                           | 3.19 | 0.918              |
| D2 | I was given the opportunity to explore learning using gamification on my own.                    | 2.76 | 1.136              |
| D3 | I feel using gamification to review learning is an interesting way.                              | 2.95 | 1.024              |
| D4 | I can adjust myself into using gamifications in no time.                                         | 2.95 | 1.071              |
| D5 | I like the content using gamification because it is easy to understand.                          | 2.86 | 1.103              |
| D6 | Learning using gamification encourages me to think.                                             | 2.90 | 1.091              |
| D7 | The use of gamification can stimulate interest in learning.                                     | 2.86 | 1.108              |

4. Discussion

Students’ attitudes towards gamification are at a high level for a difficult subject. Positive attitudes can create brilliant and insightful human beings. According to [26], one of the traits of success for students in the field of learning is the attitude, in which the attitude has a close relationship with the responsibility in learning to understand and complete the assignment given by the teacher. Students will be more prominent in learning if the learning is fun [27]. This statement is supported by [28]
stating that students will stand out if they are comfortable with the learning situation. This can be a way to appreciate the effort of preparing good teaching aid by the teachers [29]. Good teaching aid must meet its features; the suitability of the material with the contents of the taught lessons in order to ensure that the contents of the lessons are clearly conveyed to the students [30]. The use of gamification can also increase students’ extrinsic motivation towards learning. Extrinsic motivation is encouraged because of rewards like badges and grades or punitive threats [31]. The gamification also encourages extrinsic motivation that it encourages the player to win and defeat others. Good teaching and learning materials are not just effective, but are also must be interesting and motivating in order to help students to stay engaged with the learning. However, studies on gamification approaches are less focused on the production of teaching materials that can motivate students to learn. Hence, using Kahoot! as a teaching and learning platform seems to attract the respondents where their motivational constructs are at high levels [32]. According to [33], gamification enable self-learning, by letting the teacher and learner to choose the time, content and the learning pace. Indirectly it will attract students and stimulate students to achieve best learning performance. [34] argues that when interactions between either students with students, students with educators or students with reading materials can result in quality learning without any other influence that spoils interest in learning.

The use of new learning approach can attract students who are interested in learning difficult things like theoretical subjects [35]. Vocational students are more interested in what they can do for themselves because in their minds they believe that entering vocational programme is an escape way from the burdening academics. Hence, smart teachers should use this opportunity to attract their students in getting good results in certain subjects. Kahoot! used this study is not a complex platform, it only requires students to insert links as well as pin games and students can choose the name they like and then play the game. This study chooses Kahoot! because it is easy for students to understand in a very short time. Otherwise, students will run away from something that they find difficult. Teachers who are unable to control the discipline of the classes during the teaching and learning process will cause the students to have negative perception towards their teachers. So teachers now have to be wise in choosing the method and materials in delivering the lesson and at the same time preventing students from having negative perceptions.

5. Conclusion

In conclusion, after the study and the data obtained were analyzed, the importance of gamification usage in the teaching and learning process, especially in technical and vocational courses at vocational college. Aspects such as attitudes towards gamification, students’ motivation and students’ perceptions play significant roles in ensuring learning can be enhanced by using this effective methods which can ensure the maximum level of learning, thus ensuring the knowledge conveyed by the teacher is delivered effectively.

Acknowledgments

This research was supported by PPG Grant V027 from Research Management Center (RMC), Universiti Tun Hussein Onn Malaysia. We thank our colleague from Universitas Negeri Yogyakarta and Universiti Teknologi MARA(UiTm), Campus Pasir Gudang, Johor who provided insight and expertise that greatly assisted the research.

6. References

[1] Cikarge, G.P., & Utami, P. 2018. "Analisis dan Desain Media Pembelajaran Praktik Teknik Digital Sesuai RPS (Analysis and Design of Learning Media for Digital Engineering Practices in Accordance with lesson plan)". Elinvo (Electronics, Informatics, and Vocational Education) 3(1), pp. 92-105.
[2] Roberts, R. M., Neate, G. M., & Gierasch, A. (2017). Implicit attitudes towards people with visible difference: findings from an Implicit Association Test. *Psychology, health & medicine*, 22(3), 352-358.

[3] Roll, I., Butler, D., Yee, N., Welsh, A., Perez, S., Briseno, A., Perkins, K. and Bonn, D., 2018. Understanding the impact of guiding inquiry: The relationship between directive support, student attributes, and transfer of knowledge, attitudes, and behaviours in inquiry learning. *Instructional Science*, 46(1), pp.77-104.

[4] Gardner, R.C., 2014. Attitudes and motivation in second language learning. In *Bilingualism, multiculturalism, and second language learning* (pp. 63-84). Psychology Press.

[5] Lin-Siegler, X., Ahn, J.N., Chen, J., Fang, F.F.A. and Luna-Lucero, M., 2016. Even Einstein struggled: Effects of learning about great scientists’ struggles on high school students’ motivation to learn science. *Journal of Educational Psychology*, 108(3), p.314.

[6] Harackiewicz, J.M., Tibbetts, Y., Canning, E. and Hyde, J.S., 2014. Harnessing values to promote motivation in education. In *Motivational interventions* (pp. 71-105). Emerald Group Publishing Limited.

[7] Adibah, A. L., & Fatimah Harlinha, M. T. (2010). Hubungan Tingkah Laku Kesediaan Pensyarah Dengan Tahap Motivasi Pelajar. *E-Prints UTM* .

[8] Loos, L.A. and Crosby, M.E., 2017, July. Gamification Methods in Higher Education. In *International Conference on Learning and Collaboration Technologies* (pp. 474-486). Springer, Cham.

[9] McKnight, K., O'Malley, K., Ruzic, R., Horsley, M.K., Franey, J.I. and Bassett, K., 2016. Teaching in a digital age: How educators use technology to improve student learning. *Journal of research on technology in education*, 48(3), pp.194-211.

[10] Gan, B., Menkhoff, T. and Smith, R., 2015. Enhancing students’ learning process through interactive digital media: New opportunities for collaborative learning. *Computers in Human Behavior*, 51, pp.652-663.

[11] Domingo, M.G. and Garganté, A.B., 2016. Exploring the use of educational technology in primary education: Teachers’ perception of mobile technology learning impacts and applications’ use in the classroom. *Computers in Human Behavior*, 56, pp.21-28.

[12] Durlak, J.A., Weissberg, R.P., Dymnicki, A.B., Taylor, R.D. and Schellinger, K.B., 2011. The impact of enhancing students’ social and emotional learning: A meta-analysis of school-based universal interventions. *Child development*, 82(1), pp.405-432.

[13] Tran, V.D., 2014. The effects of cooperative learning on the academic achievement and knowledge retention. *International Journal of Higher Education*, 3(2), p.131.

[14] Peterson, E.R., Rubie-Davies, C., Osborne, D. and Sibley, C., 2016. Teachers’ explicit expectations and implicit prejudiced attitudes to educational achievement: Relations with student achievement and the ethnic achievement gap. *Learning and Instruction*, 42, pp.123-140.

[15] Jennings, P.A., 2015. Early childhood teachers’ well-being, mindfulness, and self-compassion in relation to classroom quality and attitudes towards challenging students. *Mindfulness*, 6(4), pp.732-743.

[16] Gregersen, T. and Horwitz, E.K., 2002. Language learning and perfectionism: Anxious and non-anxious language learners' reactions to their own oral performance. *The Modern Language Journal*, 86(4), pp.562-570.

[17] Van Houtte, M. and Demanet, J., 2016. Teachers’ beliefs about students, and the intention of students to drop out of secondary education in Flanders. *Teaching and Teacher Education*, 54, pp.117-127.

[18] Mayer, R.E., 2014. Incorporating motivation into multimedia learning. *Learning and Instruction*, 29, pp.171-173.

[19] Aldemir, T., Celik, B. and Kaplan, G., 2018. A qualitative investigation of student perceptions of game elements in a gamified course. *Computers in Human Behavior*, 78, pp.235-254.
[20] Zainuddin, Z., 2018. Students' learning performance and perceived motivation in gamified flipped-class instruction. *Computers & Education, 126*, pp.75-88.

[21] Larkin, K. and Jorgensen, R., 2016. ‘I Hate Maths: Why Do We Need to Do Maths?’ Using iPad Video Diaries to Investigate Attitudes and Emotions Towards Mathematics in Year 3 and Year 6 Students. *International Journal of Science and Mathematics Education, 14(5)*, pp.925-944.

[22] Yilmaz, R., 2017. Exploring the role of e-learning readiness on student satisfaction and motivation in flipped classroom. *Computers in Human Behavior, 70*, pp.251-260.

[23] Lam, Y.W., Hew, K.F.T. and Chiu, K.F., 2018. Improving argumentative writing: Effects of a blended learning approach and gamification. *Language Learning & Technology*.

[24] Nasrullah, A.S. and Rahman, A.W., 2018. Good EFL Learner’s Strategy In Enhancing English Mastery: A Case Study at Indonesian College Students. *Advances in Language and Literary Studies, 9*(3), pp.55-59.

[25] Najib, M. (2003). *Penyelidikan Pendidikan*, Skudai : Penerbit Universiti Teknologi Malaysia.

[26] Roll, I., Butler, D., Yee, N., Welsh, A., Perez, S., Briseno, A., Perkins, K. and Bonn, D., 2018. Understanding the impact of guiding inquiry: The relationship between directive support, student attributes, and transfer of knowledge, attitudes, and behaviours in inquiry learning. *Instructional Science, 46*(1), pp.77-104.

[27] Sawyer, R., Smith, A., Rowe, J., Azevedo, R. and Lester, J., 2017, June. Is more agency better? The impact of student agency on game-based learning. In *International Conference on Artificial Intelligence in Education* (pp. 335-346). Springer, Cham.

[28] Jagušt, T., Botički, I. and So, H.J., 2018. Examining competitive, collaborative and adaptive gamification in young learners' math learning. *Computers & Education, 125*, pp.444-457.

[29] Aynsley, S.A., Nathawat, K. and Crawford, R.M., 2018. Evaluating student perceptions of using a game-based approach to aid learning: Braincepet. *Higher Education Pedagogies, 3*(1), pp.70-81.

[30] Villagrasa, S., Fonseca, D., Redondo, E. and Duran, J., 2014. Teaching case of gamification and visual technologies for education. *Journal of Cases on Information Technology (JCIT), 16*(4), pp.38-57.

[31] Hanus, M.D. and Fox, J., 2015. Assessing the effects of gamification in the classroom: A longitudinal study on intrinsic motivation, social comparison, satisfaction, effort, and academic performance. *Computers & Education, 80*, pp.152-161.

[32] Kuo, M.S. and Chuang, T.Y., 2016. How gamification motivates visits and engagement for online academic dissemination—An empirical study. *Computers in Human Behavior, 55*, pp.16-27.

[33] Gené, O.B., Núñez, M.M. and Blanco, Á.F., 2014, October. Gamification in MOOC: challenges, opportunities and proposals for advancing MOOC model. In *Proceedings of the Second International Conference on Technological Ecosystems for Enhancing Multiculturality* (pp. 215-220). ACM.

[34] González-Howard, M., & McNeill, K. L. (2016). Learning in a community of practice: Factors impacting english-learning students' engagement in scientific argumentation. *Journal of Research in Science Teaching, 53*(4), 527-553.

[35] Leaning, M., 2015. A study of the use of games and gamification to enhance student engagement, experience and achievement on a theory-based course of an undergraduate media degree. *Journal of Media Practice, 16*(2), pp.155-170.