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GAMYFLIP-PRO MODULE: TEACHING AND LEARNING THROUGH FLIPPED CLASSROOM AND GAMIFICATION APPROACH

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ABSTRACT

In recent years, the integration of Flipped Classroom and gamification in teaching and learning process became popular in order to provide flexibility in teaching and learning process. The purpose of this innovation was to introduce GamyFlip-Pro module in teaching and learning a topic Programming for pre-university students. This module consists of two separate manuals; teacher manual and student manual. The objective of development GamyFlip-Pro module are to increase motivation and student engagement in learning programming (Problem solving), provide step by step guideline for teachers and student to implement teaching and learning using gamified flipped classroom approach and produce teaching and learning environment that interactive and educate “Fun Learning” to the teachers and students. This module was developed based on Sidek and Jamaludin’s Model, Flipped Classroom Approach, and The Five Steps of Applying Gamification in Education by Huang and Soman. Since the development of module draft complete, five subject matter experts will review the module draft. Then, module modification was done based on suggestion and recommendations by subject matter experts. This module tested to 30 students and the finding shows that GamyFlip-Pro module has a good impact to the student achievement (83.72%), motivation (4.67) and level of engagement (4.65). This finding reinforces the use of flipped classroom and gamification approach in the design of teaching and learning modules and establish the pedagogy of flipped learning and gamification in teaching programming.

Keywords: module, flipped classroom, gamification

1. INTRODUCTION

This innovation project theme is Fun learning and it is designed based on two modern pedagogical approach; flipped classroom and gamification. Flipped learning was practiced by combined face-to-face and non-face to face teaching and learning approach (Zainuddin & Halili, 2016) while gamification defined as the use of game elements in the non-context games setting (Deterding, Dixon, Khaled, & Nacke, 2011). Games elements such as Point, progress bar, badges, reward and leader board are used to give the new phenomenon in learning activity.

The study on impact of flipped classroom to the student reported that the flipped classroom gave the positive impact toward students’ achievement, engagement, motivation and interaction (Trpkovska, Bexheti, & Cico, 2017; Tugun, Uzunboylu, & Ozdamli, 2017). It is also proven that this approach promotes active participation of students and flexibility within educational processes (Flores, De-Arco, & Silva, 2016). The limitation of flipped classroom approach is to make the student do non-face to face learning activity. So, integration of gamification in flipped classroom is suggested by many researchers to solve this problem. According to Kapp (2014) and, Lee and Hammer (2011), gamification increase the

student engagement in academic activities and encourage them to learn. Gamification will drive person to take voluntary actions in a predictable way. This module was undertaken to:

- i. GamyFlip-Pro developed to increase motivation and student engagement in learning programming
- ii. Provide step by step guideline for teachers and student to implement teaching and learning using gamified flipped classroom approach.
- iii. Produce teaching and learning environment that interactive and educate “Fun Learning” to the teachers and students.

In this innovation project, there are a few components developed consist of; teacher manual, student manual, self-reflection record and Reward Card. Figure 1 show the GamyFlip-Pro Module’s components.

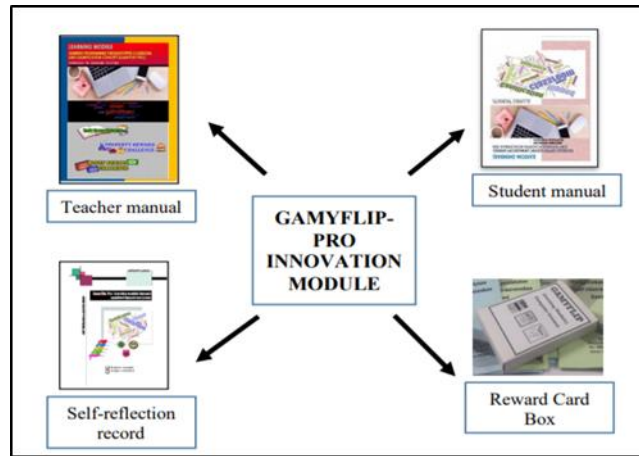


Figure 1. GamyFlip-Pro Module’s component

2. MATERIAL AND METHOD

2.1. Development

Teacher module contains lesson plan, worksheet, answer and notes while the student’s module contains the student guideline, notes and worksheet activity. Learning activities designed for two different environments suggested by flipped classroom approach; out class and in class. Out class learning activity mostly use a web platform and focus on the user learn the course followed by gamification activity in order to check the user’s understanding. While, in class activity students deal with complex issues related to the content topic. In classroom, activities designed to make the students engaged in student-to-student interactions, collaborations through group activity, and critical thinking with the instructor serve as a facilitator to support the student through the challenge activity. The module consists of two parts. To give a comprehensive overview of the module, Table I is referred.

Table 1. Modules’section

First part	Second part
<ul style="list-style-type: none"> ● Introduction ● Philosophy ● Overview of flipped classroom and gamification ● Overview of Gamyflip-Pro Module ● Rationale of Module 	<ul style="list-style-type: none"> ● Storyline ● Level 1: I am the Trainee ● Level 2: I am the Officer ● Level 3: I am the Manager Assistant ● Level 4: I am the Manager

<ul style="list-style-type: none"> • Objective of Module • Module manual 	<ul style="list-style-type: none"> • Level 5: I am the Executive Assistant • Level 6: Battle Round
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2.2. Evaluation of Effectiveness

To up the standard of module quality, the content of GamyFlip-Pro has been validated by five experts comprised of academicians and practitioners. This module is validated in three constructs including content knowledge, module activities and theoretical relation. Expert recommendations are collected to find similarities in ideas for identifying improvements that need to be made. Modification was done according to the suggestions of the expert. This module is tested to the 30 Matriculation students. They involve in teaching and learning process for eight weeks before the data collection done by using the student performance test, ACRS motivation and Classroom Engagement Inventory (CEI) questionnaire. Then, the effectiveness of this module compared that result to the class that learn using conventional method. CEI instrument will evaluate the level of student's engagement in term of three aspects; cognitive, behavioral and affection engagement. While ACRS motivation instrument that contain four motivation's dimensions; attention, relevance, satisfaction and confident are used for data collection. Table 2 shows the result of effectiveness analysis. From the table 2, we can conclude that the usage of this module gave the positive impact to the student's performance, motivation and engagement compared to conventional approach.

Table 2. Effectiveness analysis

Category	Dimension	mean	
		Module approach	Conventional approach
Student achievement	Students' achievement	83.72	69.78
Students' motivation	Attention	4.70	3.80
	Relevance	4.60	3.63
	Satisfaction	4.70	3.90
	confident	4.68	3.60
Students' engagement	Affective engagement	4.75	3.92
	Cognitive engagement	4.68	3.75
	Behavior engagement	4.52	3.83

3. CONCLUSION

GamyFlip-Pro module able to improve the students' attitude towards programming, in terms of performance, motivation and student's engagement. This module is useful to enhance the knowledge and efficacy belief in teaching programming thus increase the efficiency and motivation during teaching practice, besides reducing the anxiety level among the students while learning Programming. Teacher and students have the opportunities to integrate the flipped classroom approach and experienced with gamified learning. Moreover, this module has been validated to possess high content validity by the judgement of the experts. The results of this study can be used as a guidance for the persons involved in the planning, development and implementation of the curriculum to enhance the current curriculum, especially computer science subject. The method of teaching and learning in this module can be used as an example for all teacher to be more effective and create meaningful teaching for the students in the aspects of teaching aids, strategies and teaching approaches.

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Kelulusan daripada pihak YBhg. Profesor dalam perkara ini amat dihargai.

Sekian, terima kasih.

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