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EFFECTIVENESS OF BLENDED ACTIVE LEARNING FRAMEWORK USING BRING YOUR OWN DEVICE LEARNING (BYODL), PROJECT BASED LEARNING (PPBL) AND GAMIFICATION LEARNING (GL).

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Abstract

Active learning commonly entails learning techniques that engage students in the learning process. Two important elements of active learning are student activity and student engagement. The objective of this paper is to establish the effectiveness of an Active Learning framework based on multiple approaches to increase student engagement. This research utilizes three techniques that were blended together to optimize the effect of the three important elements of active learning, which are Bring Your Own Device Learning (BYODL), Project Based Learning (PPBL) and Gamification Learning (GL). At the start of the PPBL active learning process, students were grouped in five to six team members and each group was

given a specific project to be submitted towards the end of the semester. All assignments were uploaded in the I-Folio system for easy references. For the purpose of continuous BYODL and GL learning, students were given online attendance with QR code scan and questions from previous lessons via Google form at the beginning of each lesson to promote active learning. During the lesson, students were given short quizzes via Kahoot application and PBL question with snapshot answers via Google form and I-Folio assignment system. The results show that these techniques were found to be effective in increasing students' engagement and involvement in active learning. In conclusion, the framework that blends three approaches together has effectively optimized active learning with more than 90% students' engagement rate and have proven to be constructive to boost students' engagement and involvement in active learning.

Keywords: Active Learning, Blended learning, Learning Management System

1.0 INTRODUCTION

Active Learning does not only require students to listen to lectures, but it also entails students' engagement in class activities through reading, writing and discussions. Students must be actively involved and engaged in critical thinking tasks such as evaluating and synthesizing information. In order to achieve these, teaching and learning approaches that promote active learning must take into consideration instructional activities that allow students to carry out tasks and assessments and to reflect on what they are doing. These approaches in active learning are important since they have powerful influence on students' learning (Johari, Z., 2020). It has been proven that many approaches that promote active learning do not only enhance students' mastery of content but they are also crucial in developing students' skills in thinking and writing. Additionally, some cognitive studies have shown that some students are best served by pedagogical learning approach other than lecturing. Therefore, a thoughtful and scholarly approach to skillful teaching requires many ways to promote active learning to be used effectively across all higher learning institutions. Furthermore, to encourage self-

reflection amongst students, lecturers should be willing to experiment new alternative approaches in their active learning instructions.

Project Problem Based Learning (PPBL) is a combination of projects using the Problem Based Learning (PBL), which was first established in the 1960s, as its basis. PBL is a student-oriented approach (Ruslai, N, 2016) that provides an active learning platform for a better understanding of knowledge. It initiates essential skills that improve content knowledge while at the same time nurturing the development of problem-solving, communication, critical thinking, self-directed learning, teamwork and collaboration skills (Ramadhani. R, 2019). By incorporating a group brain-storming activity in PPBL, divergent of ideas and multiple observations could be applied to solve a problem. As instructional technology and application have advanced over time, online learning has become more interesting and has obtained numerous attentions from higher learning institutions. Therefore, blending the PPBL with Bring Your Own Device Learning (BYODL) is deemed necessary given the current advancement of technology and online learning.

BYODL (Yeop, Y, 2018) is an approach in which students bring their own devices such as smartphone, iPad, laptop and other mobile devices into the learning environment. It is forecasted that BYODL will bring in considerable impact on higher education due to the growing number of mobile devices owned by students and lecturers (Du. H, 2019). BYODL provides flexible and familiar devices that help students to be creative and collaborative. BYODL enables pedagogical opportunities for lecturers to think creatively in delivering and planning their lectures. Some possible creative pedagogies include using social media, online application and digital storytelling in the lectures. The flexibility allows students to use their mobile devices anytime and anywhere to participate in the learning activities. Students can also use their personal learning networks to develop understanding and self-oriented learning environment. Along with PPBL and BYODL, another pedagogical approach that enriches the blended learning process is Gamification Learning (GL) (Kim, E. 2018). GL has also been

increasingly used for teaching and learning in higher learning institutions worldwide (Marinensi, G, 2020).

When it was first established in 2002, GL had entailed psychology, design, strategy, and technology, before it made its online appearance at the beginning of 2010 (Khaleel, F. L., 2016) (Khaleel, F. L., 2017). One reason for GL popularity is because of the advancements of technology and applications, BYODL in particular, has also contributed to the burst of various gamification applications in many forms. GL specifically emphasizes on the use of game elements to engage and motive students to learn. Additionally, GL is a teaching and learning approach that utilizes the elements and designs of video games in education (Snyder-Renfro, C., 2020). The aim is to make a fun way of learning by gaining students' interest to promote continuous learning.

2.0 MATERIALS AND METHODS

This research is based on three techniques that were blended together to optimize the effect of the three important elements of active learning, which are Bring Your Own Device Learning (BYODL), Project Based Learning (PPBL) and Gamification Learning (GL) (Ismail, A., 2018)., as shown in Figure 1. At the start of the PPBL active learning process, for more than 50 students, they were grouped in five to six team members and each group was given a specific project to be submitted towards the end of the semester. Learning and activities were conducted in small group discussions, 5 – 6 students, depending on the total number of students. It is best that these discussions accentuate on an open-ended topic that has no right or wrong answer. This provides opportunities for students to collaborate and enhance their communication skills via problem solving.

All assignments were uploaded in the I-Folio system for easy references. For the purpose of continuous BYODL and GL learning, students were given online attendance with QR code scan and questions from previous lessons via Google form at the beginning of each

lesson to promote active learning. A think-pair-share activity is conducted via online attendance. It is done by allowing students to take a minute to ponder on previous lessons and then discuss with one or more of their peers, and finally answer the attendance Google form and share the answer with the class as part of a formal discussion.

During the lesson, students were given short quizzes via Kahoot application and PBL question with snapshot answers via Google form and I-Folio assignment system. This method provides a fun assessment for students during the active learning process while being exposed to the three approaches Project Problem Based Learning (PPBL), Bring Your Own Device Learning (BYODL), and Gamification Learning (GL). A short-handwritten exercise that is often used is the "snap and post." In this exercise, students are asked to answer the day's discussion in a short paper, and then snap and upload the answer using BYOD in I-Folio or Google form.

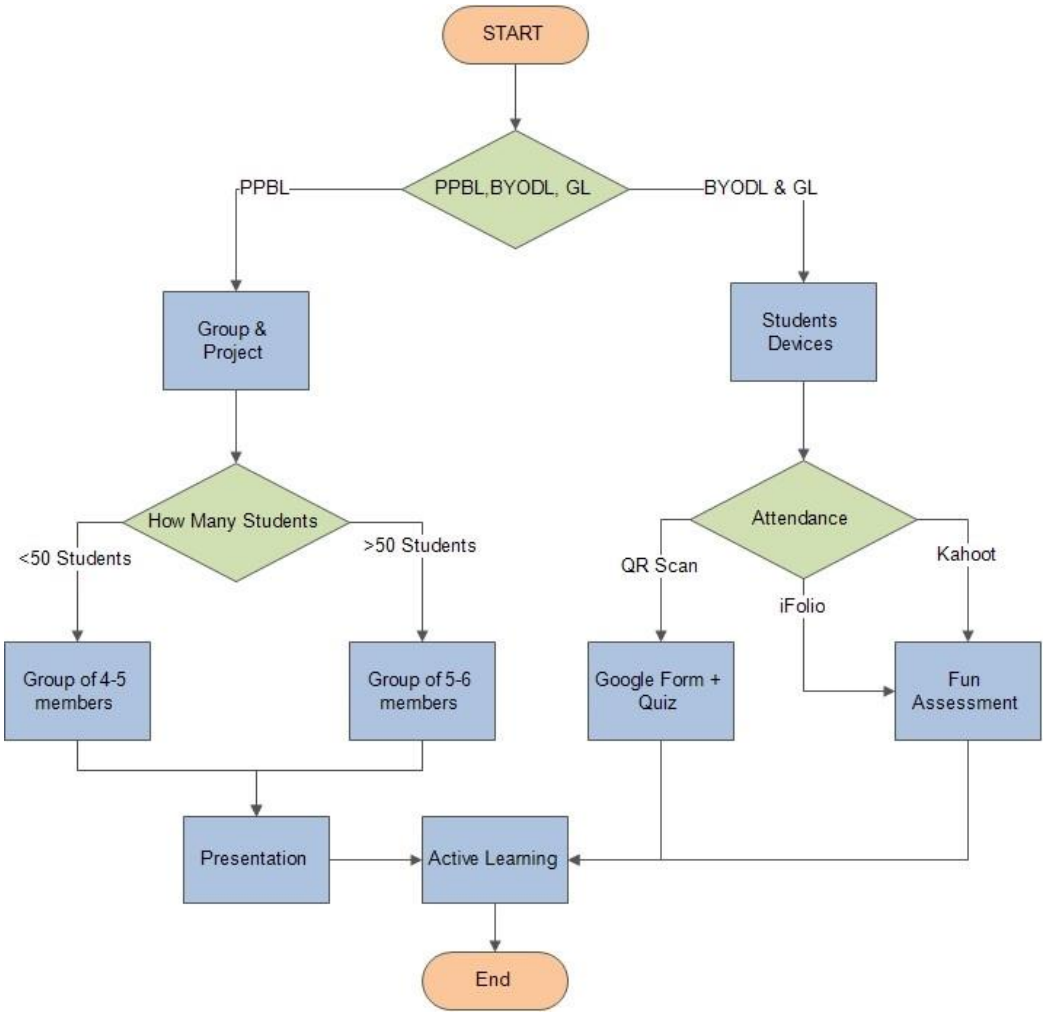

Figure 1: Active Learning Framework for BYODL, PPBL and GL

To prepare for the presentation, students do independent, self-directed study and research for the attendance, online quiz and group project before returning to their respective group. This allows for knowledge acquisition through combined work and intellectual competence. It also enhances teamwork and communication, problem-solving while encouraging independent responsibility for shared learning. Immediate feedback is obtained through trigger materials that are based on recent issues such as online news photographs, articles and Youtube videos as part of BYOD learning. Progress mechanics based on recent technologies and applications such as Kahoot, Google form quiz, I-Folio and PPBL that engage students. Finally, a survey was conducted to assess students' acceptance for the active learning framework and its benefits.

3.0 RESULTS AND DISCUSSION

The results of the implementation of the Active Learning framework that incorporates BYODL, PPBL and GL approaches are illustrated in Figure 2. The results show that there is a high implication and improvement when combining GL and BYODL together, with 97.6% of students accepting this learning framework. The benefits of the blended learning approaches for active learning and analysis are shown in Figure 3.

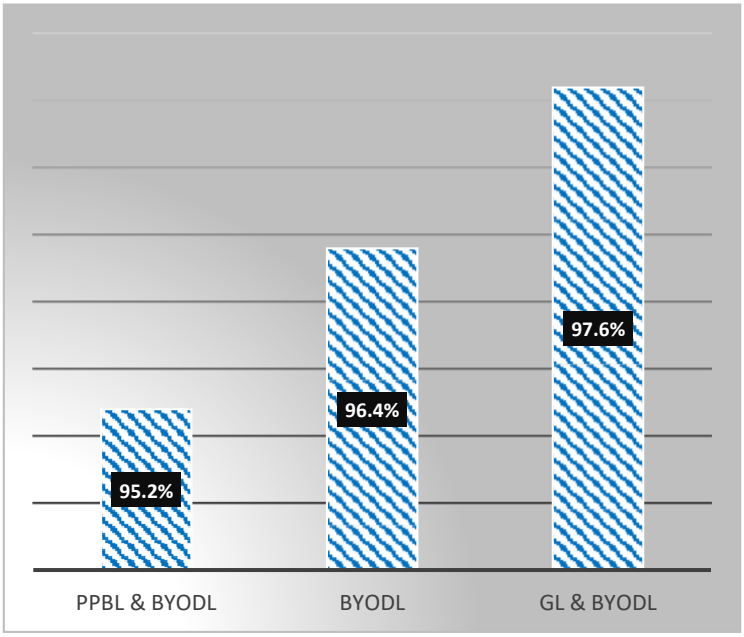

Figure 2: Students Acceptance for Active Learning Framework

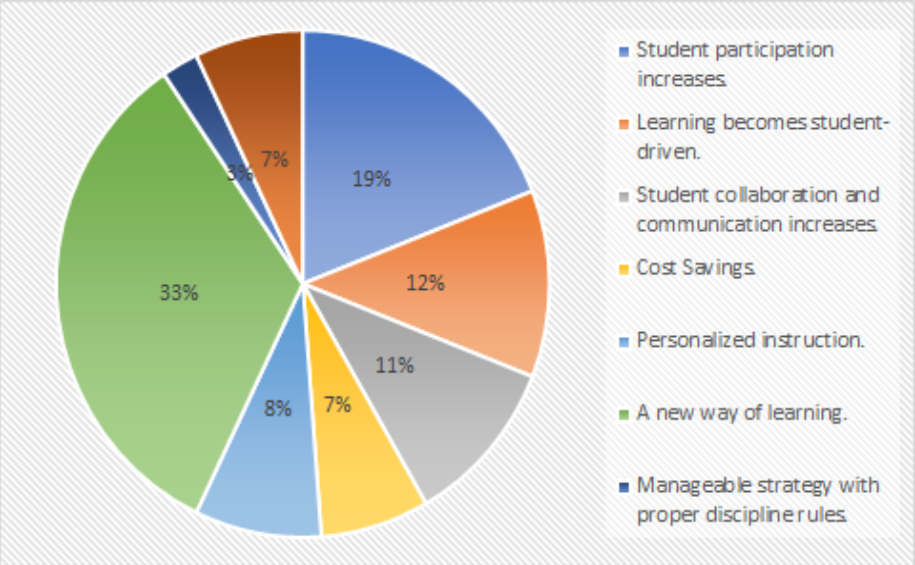

Figure 3: Benefits of the Active Learning Framework

It is interesting to note that the Active Learning Framework is a new way of learning that brings significant impacts on students. Clearly, students' participation increases along with their collaboration and communication. Likewise, more responsibility is given to the students as they dive in their learning and personalize their own learning instruction. More importantly, it is a cost saving learning which is more encouraging.

Additionally, Figure 4, Figure 5 and Figure 6 highlight the students' preferable devices, activities and learning mode. Apparently, students mostly prefer to use their smartphones (95.2%) compared to their tablets (59.5%) and laptops (6% only). It is safe to say that this happens because of the need and the desire of the "easy" and "quick" options amongst the students. These results indicate that a convenient approach of learning is more favorable and encouraging than the conventional ways.

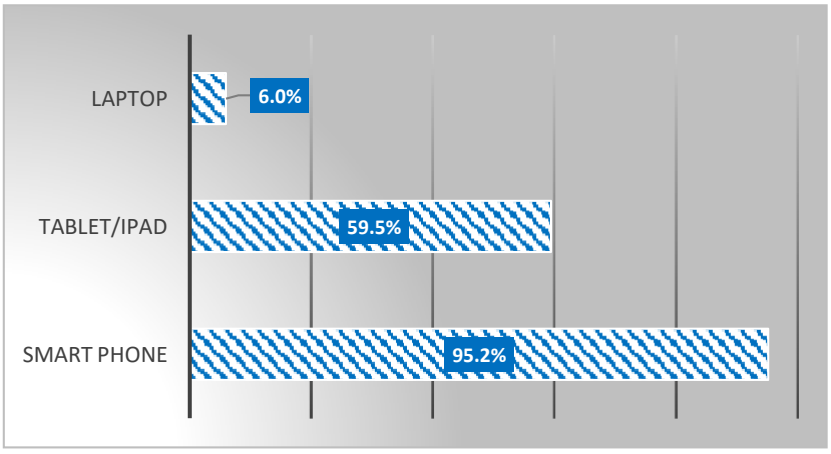

Figure 4: Students Preferable BYODL devices

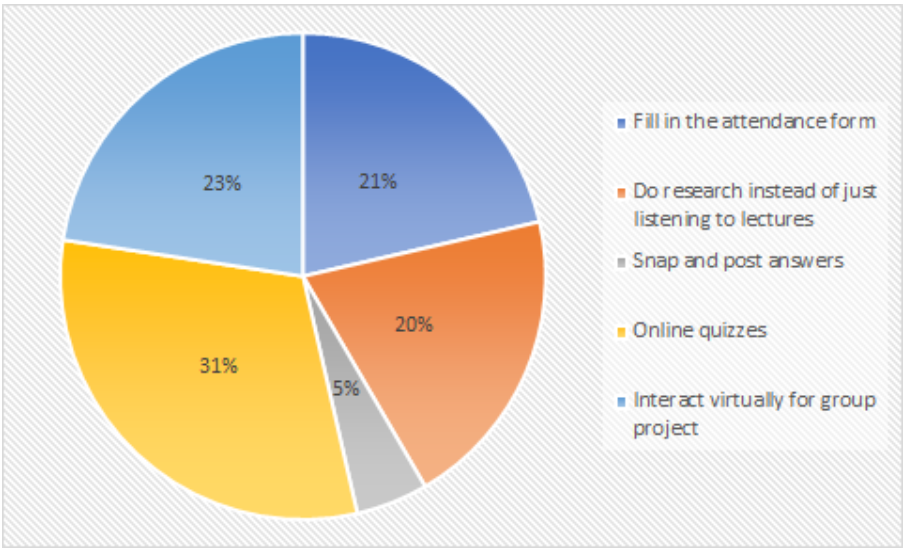

Figure 5: Students Preferable Activities

Active learning that incorporates impromptu activities are highly favored by the students. Indeed, students prefer online quizzes more than traditional pop quiz, as seen in the score of 31% in Figure 5. Moreover, they are in favor of the virtual interaction for group project (23%). The score of 21% indicates that they prefer filling in the attendance form which eases their learning and enhances their participation. It is important to highlight that the students prefer to do research rather than listening to lectures, which indicates significant choices of self-learning autonomy and responsibility among the students.

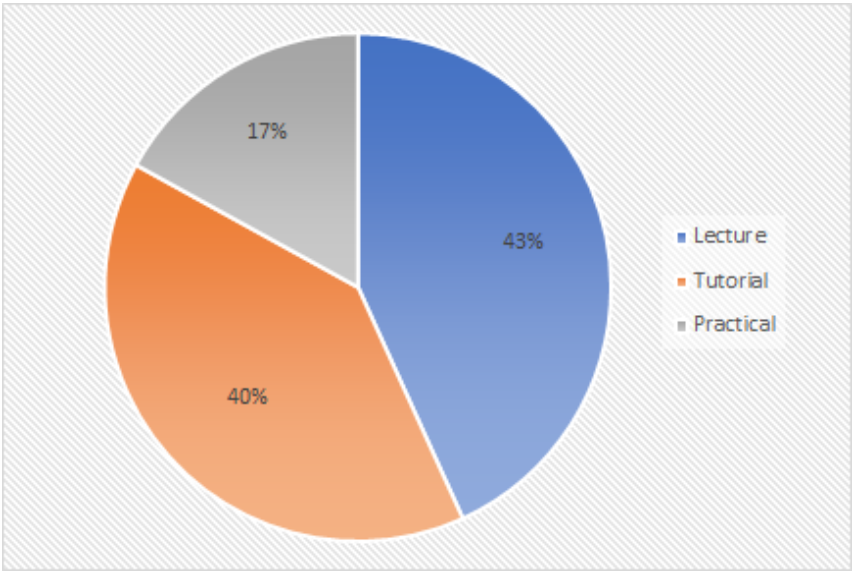

Figure 6: Students Preferable Mode for Active Learning Framework

Nevertheless, the results above illustrate that students are still in favor of lectures, 43%, as compared to tutorial, 40%, to be conducted following the active learning. The least number of them, 17%, prefer the practical part of the active learning approach.

4.0 CONCLUSION

The framework that blends three approaches together has effectively optimized active learning with more than 90% students' engagement rate. The Bring Your Own Device Learning (BYODL), Project Based Learning (PPBL) and Gamification Learning (GL) techniques combined together have proven to be constructive to boost students' engagement and involvement in active learning.

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