The Implementation of Blended Learning Instruction by Utilizing WeChat Application

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Abstract: This paper discusses about the implementation of blended learning through the use of WeChat application as a primary communication tool. In this study, ADDIE model which consist of 1) Analysis, 2) Design, 3) Develop, 4) Implement, and 5) Evaluate are the 5 stages followed by the researchers to create blended learning model approach. The results of the study were analyzed using quantitative methods in the form of a quasi-experimental design. The researchers used Non-equivalent Control Group Design which included control group classroom and experimental group classroom. The findings of this study shows that 1) there is no significant difference between control group and experimental group on average of learning outcomes for the blended learning implementation ($32 \approx 31.75$), 2) a learning outcome in both classes were observed, and 3) average learning outcomes for the classroom that implement blended learning is higher than the classroom that does not implement blended learning ($85.5 > 63.25$). Besides that, the findings show that the majority of students managed to get the highest value in the blended learning classroom environment. Thus, this situation shows that the distribution of knowledge can be equally distributed to the students with the use of WeChat application.

Keywords: Blended Learning, WeChat, ADDIE.

1. Introduction

Learning methods are always evolving with the development of information technology. Learning in this information and digital age has a tendency towards active learning style, sequential learning style, sensing learning style, and visual learning style (Felder & Soloman, 1993). Active learning style encourage students to be able to conveniently access and search for learning resources independently. Sequential learning styles will facilitate the absorption of the material provided in a coherent, logical sequence, and clearly related to one another. Sensing learning style tends to give clear application and expecting relevance to the every day world. Visual learning style will help students with the use of visual learning tools such as charts, schematic and flow diagram.

Due to the rapid human mobility and the development of new technologies, blended learning has become a new trend in our educational system as an innovation in addressing the learning challenges of the times. Blended learning is a term of combining conventional learning models with the internet-based learning model that is commonly known as e-learning (Uno, 2011).Blended learning requires interactive communication system so that there is enough space for discussion outside the classroom. Communication is also necessary to provide sufficient instructions to the students to do the tasks and give guidance of searching learning resources independently. Besides that, interactive communication system also ideal for providing a delivery service of audio, photos, video and documents. For flexibility to access, we also need to have mobile communication system as a new medium to face with the challenges emerged as the result of rapid human mobility (Lin & Lu, 2011; Karpinski, Kirschner, Ozer, Mellott, & Ochwo, 2013; Goa & Zhang, 2013).

WeChat application is considered as one of mobile-based communication tools that has been used as an alternatives for instructional delivery medium. (Yuan, Chen, & Zhang, 2012; Li, 2013; Bai and Hao, 2013). This application is available for all smartphone platforms including iPhone, Android, Windows Phone and Symbian. WeChat provides opportunities to conduct group discussions (chat) among its users and support the delivery of voice, images, video and text messaging. Theapplication can be downloaded for free and can also be integrated with student' campus life (Chun Mao, 2014).

This research was conducted to investigate on 1) How the implementation of blended learning classroom could be done through the use of WeChat application and 2) What are the learning outcomes from the application of blended learning instruction by using WeChat. For that, the evaluation of the blended learning classroom through the use of WeChat application included these questions: 1) Is there a significant difference in learning outcomes for the classroom that implement blended learning environment?; 2) Is there a significant difference in learning outcomes for the classroom thatdoes not implement blended learning environment? ; and 3) Is there a significant difference in learning outcomes between blended learning classroom environment and non- blended learning classroom environment?

2. The Design of Blended Learning

The blended learning instruction was designed by using the ADDIE model. It is one of the instructional design model that shows the stages of design which is intuitive and easy to learn. ADDIE model can serve as guidelines in building a more effective, dynamic and supportive learning environment. This model has five stages of development, namely 1) Analysis, 2) Design, 3) Develop, 4) Implement, and 5) Evaluate (Sukenda, Falahah, Fabian, & Lathanio, 2013).

2.1 Stage 1: Analysis

Analysis is the first stage that consists of performance analysis and the of student's learning needs analysis. Performance analysis aimed to identify problems in the learning process. From previous researches that have been done, the main problem found is there a lot of students having problem to focus in their lectures.

Student's learning needs analysis aim to identify the solutions that can be used to overcome learning problems found in the performance analysis. Some solutions include the use of communication media to provide an overview of material before the students attending the lectures. This is because some syllabus that have been shared by the instructors may not enough. Media communication used to become a suitable medium for learners because they are easy to use. In this study, media selected is a WeChat application and Weebly blog to share the learning materials so that students can get access to it whenever and wherever they are.

2.2 Stage 2: Design of Learning

Design of learning aims to design a conducive learning experience that is suitable for students for the learning purposes. The learning experience includes descriptions of learning media, learning materials, and kind of evaluations used to evaluate the students. Indicators of successfull learning process can be measured through the achievement of learning objectives created and agreed between the course instructor and the students at the beginning of the term.

The researcher has developed a conceptual model that has been used in study. The process of learning design begins when the course instructor started to plan and organize the course content according to the student's needs. The instructor later upload the learning materials earlier so that students can get access to it in advance. Learners can access the learning materials uploaded online via computers orsmart phones. Figure 1 illustrates the flagship of blended learning model used in this study.
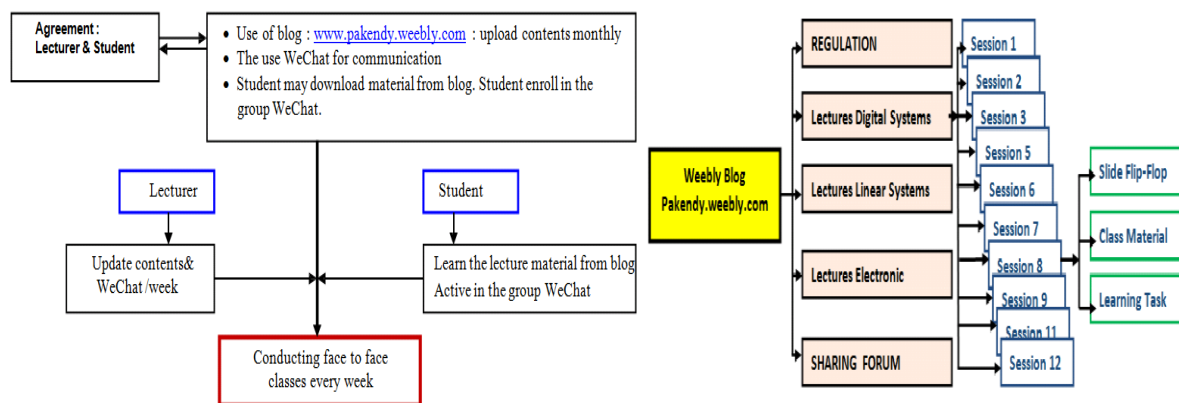
Figure 1. The Design of Learning and the Story Board for Blended Learning Instruction

2.3 Stage 3: Develop

The instructors has developed their own Weebly blog to save all learning materials for the students. During the first meeting between the instructor and the students, general overview on how to access learning materials is conducted to facilitate the learning process. The learning materials are made up from several folders that have subfolders in it. Besides that, the regulations part is also written and should be read by all students. The learning materials of each meeting are presented in the specific folders so that students can have an easy access to the desired materials. For the purpose of guidance and consulting, the instructor has created WeChat group classes so that they can conduct group discussion of each topic whenever necessary.

2.4 Stage 4: Implementation

The next stage is the direct application of blended learning to the learners. The implementation of blended learning classroom has been running for twelve meetings between the course instructor and the students. Generally, the meetings have been successfully implemented in accordance with the agreed plan at the beginning of the term. The WeChat group created is always active and up-to-date with the discussion and consultation. The logs of each WeChat group during each meeting are saved in the instructors' email as well as in the Blog. After each face-to-face meeting was held, the WeChat group will usually become active.

2.5 Stage 5: Evaluation

In the last stage of the ADDIE model, an initial evaluation of the blended learning classroom was obtained through the feedback received from the students. Some students reported that they are having problem to access the learning materials uploaded in the Weebly blog especially from outside the campus area. This situation against the aims of blended learning classroom which can provide easy access to learning materials so that learners can learn anywhere and at anytime without the need to wait for lecturers come into the classroom.

Realizing the problem faced by the students, the instructor has taken an initiative to overcome this problem with the use of classroom-based WeChat group as an interactive communication tools among them. The use of this group is not only limited for the discussion of lectures, but also can be used for distribute learning content in the conventional classroom setting.
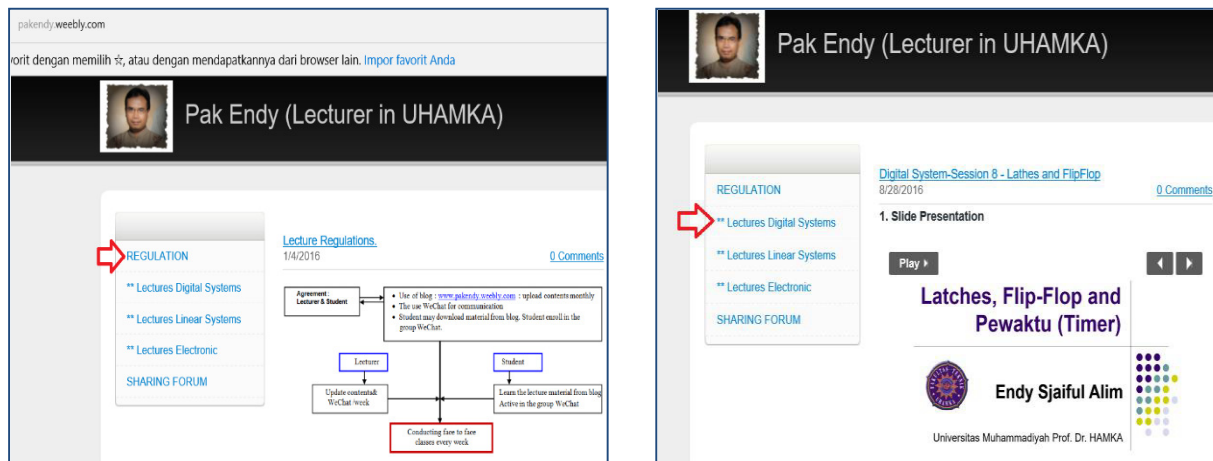
Figure 2. The Interface of the instructor's Weebly blog

Figure 3. The Interface of the WeChat group invitation and uploaded materials on WeChat

3. Research Method

This study was conducted among the students of the Informatics Engineering programme. The research sample for this study was taken from two classes. There were 20 students each for the experimental group classroom and control group classroom. A quantitative method in the form of a Non-equivalent Control Group quasi-experimental design was employed.

The first group, which is the experiment group, consisted of 20 students who received the blended learning instruction. Pre-test was carried out before the implementation of blended learning instruction to determine the existing knowledge on related topics owned by the students. After that, the researcher has carried out post-test on the same topics to determine whether there is any significance different after the students have received the treatment, which was the blended learning instruction.

While for control group classroom, the students did not get any treatment of blended learning instruction. The same approach applied to experimental group classroom has been taken to this control group whereby the researchers has conducted pre-test before conventional learning begins to determine the existing knowledge on related topics owneds by the students. Post-test was also conducted to determine whether there is any significance different after the students received the treatment of conventional learning environment.

In this study, the data analyzed consisted of primary data and supporting data. Primary data were gathered from the student's test data while supporting data collected from the interviews conducted with the faculty and students in response to the implementation of blended learning instruction. The data analysis technique used by the researcher is non-parametric statistical test developed by Mann Whitney and Wicoxon.

4. Results

4.1 Control Group Classroom

Pre-test results in control group classroom demonstrates that students has an average value of 32 with a standard deviation of 3.77. The lowest scoreof pre-test results obtainedis 25 from two students while the highest value for pre-test achieved is 40 from one student . Pre-test scores attained by most students in the control group is 30 which come from nine students.

Post-test results in the control group classroom demonstrate the result of students after getting the treatment of conventional learning. Post-test in the control group has an average value of 63.25 with a standard deviation of 7.83. The lowest score obtained for post-test result is 50 from two students and highest score for post-test is 80 achieved by one student. Post-test scores attained by most students in the control group is 70 which come from six students.
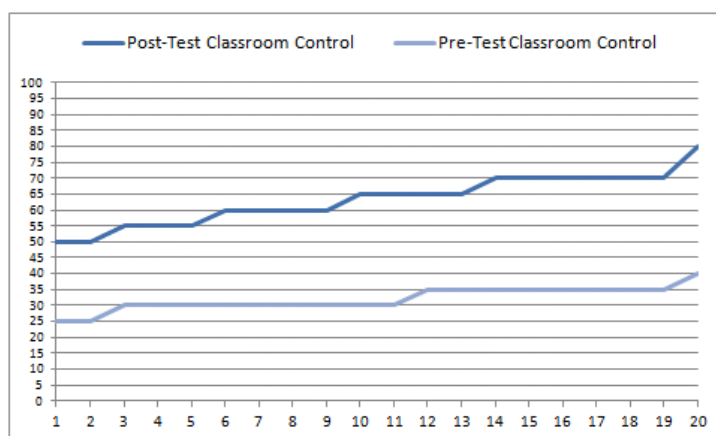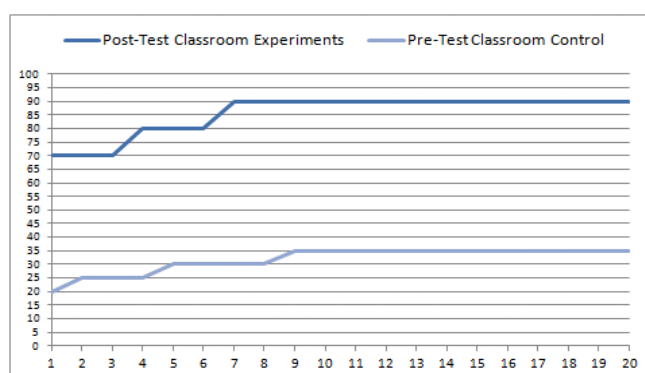

Figure 4. Comparison between Pre-Test and Post-Test in the Control Group Classroom

4.2 Experimental Group Classroom

Pre-test results in the experimental group classroom shows that existing knowledge possessed by the students have an average value of 31.75 with a standard deviation of 4.67. The lowest score obtained for pre-test is 20 from one student while the highest score for pre-test in this experimental group is 35 from 12 students. Pre-test scores achieved by most students in the experimental group is 35 which come from twelve students.

Post-test results in the experimental group classroom demonstrate whether there is any significant different in term of student's achievement after received the treatment of blended learning environment. The average value for post-test in an experimental group classroom can be considered high which is at value of 85.5 with a standard deviation of 7.59. The lowest score for post-test is 70

come from three students in this experimental group while the highest score for post-test is 90 that came form fourteen students.

Figure 5. Comparison between Pre-Test and Post-Test in the
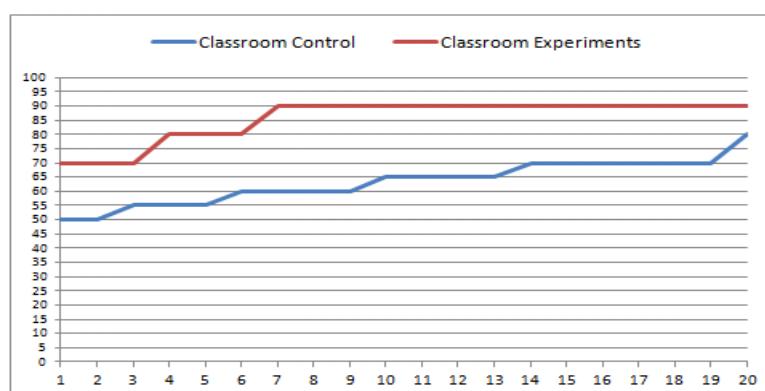Experimental Group Classroom Experiment

4.3 Discussion

The average score for pre-test in the control group classroom and experimental group classroom is almost the same. The lowest score for pre-test in the control group is higher than the lowest score in the experimental group ($25 > 20$). Similarly, the highest value for pre-test in the control group classroom is higher than the highest score in the experimental class ($40 > 35$). This indicates that even the average value for both group is similar, but the control group classroom has a great potential advantage compared to the experimental group classroom.

Table 1: Comparison of the results between pre-test and post-test for both groups

VARIABLE	PRE TEST			POST TEST		
CLASSROOM	Mean	Low Score	High Score	Mean	Low Score	High Score
Control	32	25	40	63.25	50	80
Experiment	31.75	20	35	85.5	70	90

The lowest score for post-test in the experimental group classroom is higher than the control group classroom ($70 > 50$). Similarly, the highest score for posttest in the experimental group classroom is higher than the control group classroom ($90 > 80$). From the data analysis conducted, the researcher found that there are significance different in learning outcomes in the experimental group classroom compared with control group classroom. This is the evidences that the implementation of blended learning in the classroom could help students to accomplish the desired learning outcomes much better compared with the conventional classroom.

Figure 6. Comparison of Post-Test Scores between the Experimental Classroom and
the Control Classroom

From the data analysis, the four hypothesis testing has proven that: 1) There are no significant differences in term of pre-test result between control group and experimental group, 2) There are significant difference (increase) in the conventional classroom learning outcomes (control group) but the difference are relatively small, 3) There are significant difference (increase) in term of learning outcomes in the experimental group classroom, and 4) There are significant difference in learning outcome achieved between blended learning classroom (experimental group) and conventional classroom (control group).

The results of detailed observations also shown that there is no decline in value between pre-test and post-test in the classroom that implement blended learning. It can be concluded that all students in the classroom have improved their knowledge when blended learning take place in their environment. Besides that, the researcher also suggest that the success rate ofstudent's achievement are distributed evenly because there are 14 students in the classroom who are able to achieve the high score.

5. Conclusion

The conclusion that can be drawn from this research is the implementation of blended learning through the use of WeChat application had successfully improve the student's learning outcomes. Moreover, the result also shows that the distribution of information and knowledge can be distributed evenly among the students in the classroom. The use of instructional media is highly dependent on learning resources. Because of that, more research on the development of teaching methods needs to be done since most students can easily influence by the use of technologies in their learning process. The researcher has selected WeChat application in this study because it has many advantages including have high speed and can easily distribute the information. Besides that, WeChat application also provides flexible learning environment where students can have the freedom to study at their own time. Instructors of blended learning classroom must carefully select all the learning materials provided to students so that the educational value remains dominant in the formal education setting.

Acknowledgements

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