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E-LEARNING FOR ENHANCING CREATIVE THINKING AMONG UNIVERSITY STUDENTS

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Abstract

This study was conducted to enhance the level of creativity among students from the School of Education, Universiti Teknologi Malaysia by using e-learning. The main purpose of this study is to probe into the effectiveness of e-learning developed by the researchers for enhancing creativity. This study also look into how the learning process of creative thinking takes place among higher institutions students. The e-learning uses has been developed using the integration of Problem-Based Learning methods and creativity problem solving model (CPS). The samples are undergraduate students from the Faculty of Education who was sampled using purposive sampling technique. This is a pre-experimental study using quantitative and qualitative approach where students answer 6 items for the pre-test before receiving the intervention and later answering the open-ended question for the post-test. The reliability of the instrument was measured using internal consistency technique. The minimum Cronbach Alpha value is set to be at 0.6. The time session of preliminary study was recorded and will be used during the actual study. To obtain the qualitative data, students had to discuss in the forum that will developed in e-learning to observe their learning analytic data. This study is expected to produce a creativity learning framework for tertiary education students.

Keywords: E-learning, Problem-Based Learning, Creative Thinking

1.0 RESEARCH BACKGROUND

The application of e-learning in higher learning institution has been well established. However, its usage is still limited to just certain application such as for the purpose of uploading notes and making announcements. The emerging of mobile and accessible methods of any e-learning provides a positive impact in education that is capable of promising the potential and capabilities of lifelong learning that may cover every certain area. The development of e-learning has also made the provision of learning materials can be accessed by the users at any time. Although researchers describe e-learning as having positive effect, there is still lack of research on the development of creative thinking through e-learning.

Creativity is an important skill for students and it is essential in producing skilled and creative minded graduates, rather than emphasizing too much on academic achievement. The need for creativity is not only helpful in the aspect of the nation but at individual level as well. Where the development of emotion, communication and job opportunities after their graduate are through the encouragement of creativity.

2.0 PURPOSE OF THE STUDY

E-learning at higher education institutions in Malaysia has been long established, but the use of it is still limited to certain uses such as uploading notes and making announcements. Based on mobile and accessible anywhere and anywhere e-learning can provide a positive impact in education that is capable of promising the potential and capabilities of lifelong learning. Although many explanations that e-learning have a positive benefit, however, studies have found that there is lack of research on generating creative thinking through e-learning.

A study was conducted at Universiti Teknologi Malaysia by Shaharuddin Md Salleh in 2010[4] on the level of creativity among final year student in Faculty of Education. The study reports that 85.10% from the total respondents showed a low level of creativity. On the same year a research was conducted among 120 Social Science and Education student also in Faculty of Education Universiti Teknologi Malaysia by Mohammad Yusof Arshad and Asma Abdul Salam [5]. The result shows 52.5% of the respondents are within the creative range as having means creativity. Indicating that Social Science and Education student in Faculty of Education as having moderate level of creativity.

There a several cases that the implementation of the e-learning itself can developed a structure of learning analytic. Through past research, more or less they tend to create a structural online learning environment to increase creativity, yet, few research studies look in to the learning analytic on creativity aspect through the system that them develop. That in these studies, the learning analytic aspect of creativity skill will be the focus and the procedure to analyses the data are among the aim of the study.

■3.0 LITERATURE REVIEW

Problem-based learning (PBL) is a student-centered approach where students are exposed to action to pursue academic materials, theories, methods, understanding, and skills to solve problems. Implemented PBL in the e-learning system can create a framework that students can access anywhere to develop joint solution skills through their existing experience and knowledge where PBL learning is usually an open, challenging and needing solution in the answer seeking process. The need for creative thinking amongst higher education students today is for the higher institutions to develop people with skills in analyzing problems, logical arguments, expecting probabilities and exploring new ideas by the year 2030. More of that, education in Malaysia needs a transformation if Malaysia wants to improve her economic development through the use of creative thinking.

The formation of this problem based learning is more focused on the actual situation faced by the students to bring about better results. Previous studies on problem-based learning state that cognitive factors play an important role in the development of human creativity. The need for the process 1) the specific knowledge needs 2) integrate the knowledge to find the problem solving method 3) the application of knowledge to solve the problem. Through problem-solving learning will also lead to communication and discussion of understanding between students. It creates an atmosphere in the classroom that gives students the opportunity to learn together, solve problems in groups, share ideas with each other.

Creative Problem Solving

The Creative Problem Solving model is the result of Alex Osborn's research in 1940 based on the Wallas Stage Model 1926. In the early stages of CPS Osborn's modeling using a seven-step approach to addressing the problem of creativity. Osborn has developed this model in stages that there are six versions of the model produced over a period of 50 years, and through the CPS Model these researchers support that creative thinking requires: (1) a process involving multiple rating; (2) focus on problem solving; (3) thinking skills work deduplicate and indefinitely; and (4) influence the incubation stage of thinking to find the solution. There is study found that the Model can collaborate effectively for creating new learning environment throughout technology.

Conceptual Framework

Figure 1 shows the conceptual framework for this study, where students' creative thinking skills are expected to rise after undergoing an intervention process using the developed e-learning. To measure the differences before and after the intervention process, students go through (TTCT) creative thinking test as a pre and posttest to measure any changes after using the e-learning to be developed. Students' learning process will be examined using analytic tools e-learning system.

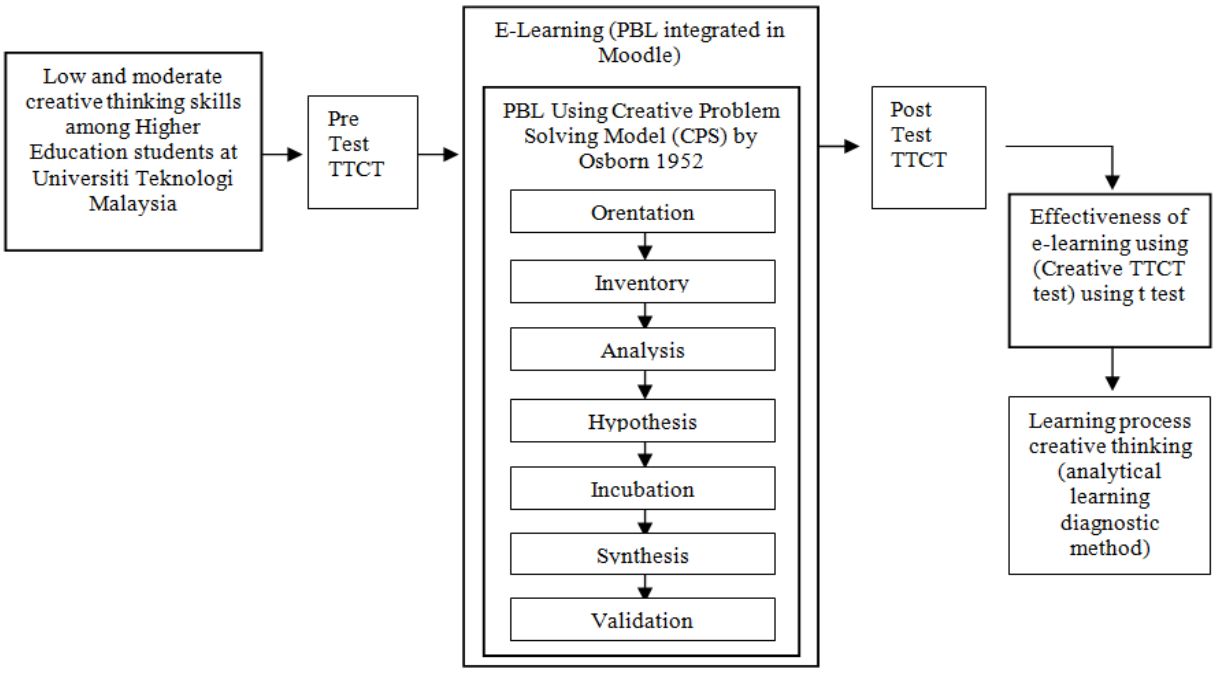


Figure 1: **Conceptual Framework**

The finding was the performance achievements of problem solving in e-learning discussion are presented. The first research study is to study the effect of problem solving towards creative thinking through problem solving.

■4.0 RESEARCH METHODOLOGY

This study is to examine the effect of the developed e-learning toward creative thinking performance after sample's engagement with the e-learning. Also, to get the data from the pre and posttest using pre-experimental research design and to conduct quantitative form to measure the change in performance level of creative thinking skills. Qualitative data for the learning analytic aspect was collected through Moodle log, while open ended question is to analyses effectiveness of the system that been develop. The study consisted of first year undergraduate student that was selected via purposive sampling from the School of Education, Universiti Teknologi Malaysia (UTM). Table 2, shows both of the process of the test.

Figure 2: Pre-Experimental Research Design

Quantitative Pre-Test	Intervention	Quantitative Post Test	Finding
A1	X = 8 week	A2	Overall result and analysis

Qualitative method	Finding
• Participant that been selected • Those participants must finish the intervention and pre and post test	Discussion of the system effectiveness Discuss the code and themes of overall outcome of the result

Instrument

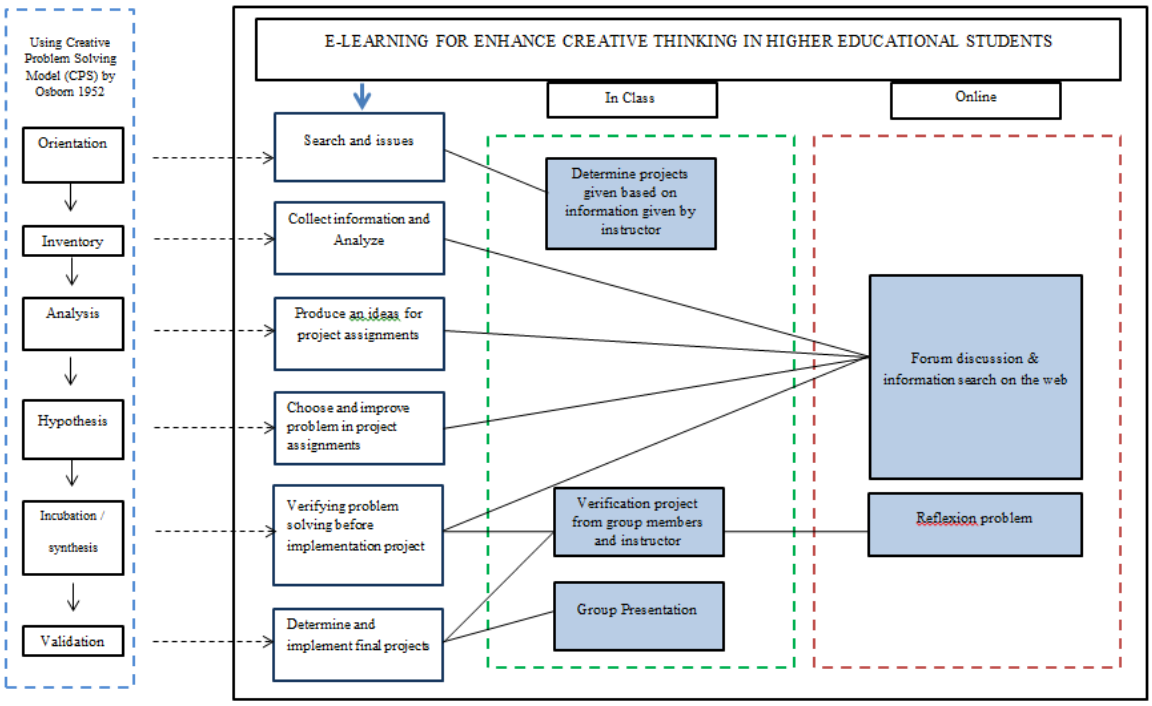
As these study use consists both of type analysis, were in this study the quantitative act as the primary data, while qualitative data gives supportive roles in the analysis and discussion. The pre and post quantitative data was collected using Torrance Test of Creative Thinking (TTCT) -A (adult) as the sample is among the undergraduate student in higher education institution.

The qualitative data are collected using open-ended questionnaire, from participant that been selected and those participants must undergo all of the intervention session and pre and posttest are need to be completed. The data finding is to discuss of effectiveness of the system, and to discuss the code and themes of overall outcome from the result provide to support the quantitative data.

■5.0 RESULTS AND DISCUSSION

Data been collected for achieving the stated research goal which is to measure student creativity before and after the treatment. A pre and posttest were conducted to answer a research question (a) the effectiveness of using e-learning to enhance creativity in higher education students. The learning analytic will be collected through log files, performance test, surveys and interviews, below are the table that showing the flow of the system that been integrated with the PBL method based on the CPS model by Osborn 1952.

Figure 3: CPS Model approach for implementation PBL in e learning



Intervention

The intervention was using Alex Osborn CPS model which involve *Observation*, it provides problems to students, Students are required to issue as many problems as possible for the given problem. *Inventory*, Give ideas and reasons, Students are asked to assume and give an idea of how the problem can be processed. *Analysis*, Provides new ideas from ideas, the students are required to produce any process and the probability that the problem can be processed makes the new solution through the ideas given. *Hypothesis*, Improve the original process into a new process through a combination of ideas. *Incubation and synthesis*, Students are required to disclose the function of the solution, object, or process that has been produced. *Validation*, the students need to clarified things and the process of solution, or any improvement that they made and the possible possibilities they found for the problem can be done.

Performance

Torrance Creative Thinking Test (TTCT) by Torrance (1967) will be used for performance test. This method will capture the student performance on creativity aspect before and after the intervention process and the test can be analyses base on TTCT method. Torrance (1967) suggests that creative thinking refers to the ability to think from various aspects of human mental operations such as smoothness, flexibility, authenticity and explain in detail the ideas of ideas developed to produce new ideas. To measure this skill, the TTCT questionnaire forms in the form of set A and set B are used for students to measure creativity skill, there are six activities to be answered by the students through this test form.

System Logs/Moodle Logs

The learning analytic tool will be used to understand how the samples shape their creative thinking when using e-learning to be developed. The amount of access that is made and the access time period will be recorded as in the Schedule.

The flow of the system based on Alex Osborn CPS model and the procedure will be divided accordingly with the need of the system either through online and in class method as it is crucial that the student engage with the system itself for the interaction (log files), in the end of the procedure, the system be capture the data and it easily analyses. With the help of analytic learning will benefit the better understanding of student data as well as assisting an institution to address problematic students in academic or specific skills.

■6.0 CONCLUSION

The research findings that achievement in terms of creativity measured using Torrance Creative Thinking Test (TTCT) after the engage using the e-learning are better than before the intervention session. By doing these it will show the effectiveness of e-learning system that been developed for enhancing creative thinking among student. As this research emphasizing on finding the effectiveness of e-learning to

enhance creativity, there is more some area of learning experience and other learning theory such as critical thinking can be on attached in the system for further learning. Through the integration of creativity into e-learning, it is clear that e-learning is a contextual learning tool and support collaborative learning that could facilitate the digital literacy.

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***Dedication:**

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