PBL through MOOC Vs Creativity Skills among Student

Authors:
1Md Nasir Bin Masran, 2Nurul Huda Binti Ibrahim*, 3Intan Noorazlina Binti Abdul Rahim
1Faculty of Human Development and Management, Universiti Pendidikan Sultan Idris, Tanjung Malim, Perak, Malaysia
2,3General Studies Department, Kolej Poly-Tech Mara Kuantan, Pahang, Malaysia
*Corresponding Author:
*Nurul Huda Binti Ibrahim
*General Studies Department, Kolej Poly-Tech Mara Kuantan, Pahang, Malaysia
E-mail: huda_i@gapps.kptm.edu.my

Abstract:
Creativity skills refer to students’ ability to generate and refine solutions to complex problems or tasks based on deductive reasoning, analysis, and combining or presenting what they have learned in new and original ways. Other than that, students should be able to think out of the box to examine the ways in solving problems, and the students performed hands-on practices. It may demonstrate a good understanding and build creativity skills in the assessment and task. This implies that students will be more effective if the tasks provide authentic learning with relative purposes and objectives. Students will then be able to learn constructively while putting their hands on to complete or finish their tasks. This study aims to explore the students’ creativity skills by using PBL through MOOCs to participants in five different classes enrolled for the MOOC Module. This observation procedure aims to observe the respondent's attitude throughout the learning process. The unobtrusive observation conduct where the researcher did not interact with the respondents but rather record their behavior. Results exhibited that the respondents show a positive behaviour attitude towards the element of creativity skills after the implementation of PBL through MOOC.

Keywords: Project Based-Learning; Massive Open Online Courses; Creativity skills; Collaborative Learning; problem-solving.

Introduction
In the 21st century, Malaysia faces new challenges in acquiring the highest degree in skills development among students as a preparation for the new generation that has excellent soft skills for leading the society. Students nowadays continue their studies to make sure that they pass in exams but not to increase social skills or soft skills. According to (Soh, Arsad, & Osman, 2010), the employer needs skills such as creative thinking, problem-solving, and analytical skills in order to have the more flexible workforce and engage in the challenges faced by lines. Students are not getting adequate material and input to meet the demand of the industries standard. With the continuous practice of Student-Teacher centered learning, it is easy for the students to think out of the box and solve the real world problem. The Project-Based Learning (PBL) through MOOC was implemented as a teaching method that will provide the need to use multiple approaches to deliver content as well as to develop soft skills among students. In Malaysian context, PBL is still considered a new
method of teaching and learning as announced by the Ministry of Education in Malaysian Education Blueprints (2013-2025). It is important that MOE includes the hands-on assessment or PBL in learning processes as a part of the curriculum and assessment in classroom.

The purpose of the study is to investigate the problem-solving skills develop after the implementation of Project-Based Learning through MOOC among KTPM students.

**Literature Review**

**Project Based-Learning**

PBL is focused on the students and provide an opportunity for students in conducting an investigation of the given project or topics (Caturangga, 2014). PBL should be conducted based on the stages starting with developing the question for the designs, planning for the project, arranging the schedule, checking or testing the progress of the project and assessing the outcome. Students should be accessed through their critical thinking or problem solving, communication or oral presentation, collaboration, and technology skills.

PBL is a learning activity that shifts away from the traditional teaching technique which focused on teacher-centred learning towards more student-centred learning which concentrates on the real-world issues and practices. It is a teaching strategy that fosters the summarization of theory, completing the responsibilities and discovering the multifaceted issue in which student’s shows their understanding of gaining the new knowledge.

On the other hand, project-based learning is a method in which the students react to the real-world questions or tests their knowledge through an extended investigation process (Lattimer & Riordan, 2011) and allowing the student to apply their creativity, promoting them to collaborate in the group, leading the project and accessing the information which necessitated them to participate willingly in-class activities (Bedard, Lison, Dalle, Cote & Boutin, 2012).

**Massive Open Online Course**

The Massive Open Online Courses are defined as an online platform in a learning process that supports the PBL process implement in the classroom. The first MOOC has been established and organized by George Siemens and Stephen Downes (de Waard, et. al, 2011). MOOC is a WWW-based course available for free to any participant from any parts of the world (Abeer & Miri, 2014; Cormier, & Siemens, 2010; Kop & Carroll, 2011) and provide free access to high-quality learning materials, offered by universities or college. Since then, a lot of MOOC researches and experiments have been done, resulting in a better understanding of how MOOC can help teachers and learners in this new e-Learning era.

There are two types of MOOC called cMOOC and xMOOC. These two MOOCs are widely used in teaching and learning in education (Knox, 2016). Most of the educators currently collaborate in cMOOC and xMOOC in offering the learning design and development challenges in education, Rodriguez,(2012).

According to (Chai & Yang, 2014), MOOCs is the research object to explore the organizational form, teaching method, the function of the platform for teaching, teaching assessment, characteristics and problems in learning while (Lombardi & Oblinger, 2007) in (McAuley, Stewart, Siemens, Cormier, & Commons, 2010) stated that MOOC integrates the connectivity of social networking, the facilitation of an acknowledged expert in a field of study, and a collection of freely accessible online resources.

MOOCs is a relatively new model for the delivery of online learning to students because this new method of teaching and learning are intended to be accessible to many more learners than would be possible through conventional teaching (Onah & Sinclair, 2014) and yet MOOC is developed to become a favored approach to learning and studying which has been rolled on to universities worldwide where learners are able to engage and get the benefit from the teaching (Dewar, U homoibhi, Ross & Hutty, 2014).

**Creativity Skills**

Creativity skills refer to students’ ability to generate and refine the solution to complex problems or tasks based on deductive reasoning, analyzing and combining or presenting what the student have learnt in the new and original ways. Other than that, students should be able to think out of the box to examine the ways in solving the problem

According to Partnership for 21st-Century Learning and Innovation skills (21st Century Framework) creativity skills involve as an instrument of
innovations in learning which people should be able to think in a more creative way and work imaginatively in group. According to P21 Framework for 21st Century learning, in order to promote creativity in the classroom, a teacher utilizing the PBL methodology must develop students’ attitudes related to creativity which will be referred to as the CORE (confidence, ownership, resiliency and engagement). It refers to the necessity for teachers to facilitate the growth in a student’s confidence, ownership, resiliency, and engagement (CORE) in order to encourage creative thought.

**Table 1: P21 Framework for 21st Century learning on creativity**

<table>
<thead>
<tr>
<th>Confidence</th>
<th>Develop, implement and communicate new ideas to others effectively</th>
<th>Act on creative ideas to make a tangible and useful contribution to the field in which the innovation will occur</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ownership</td>
<td>Demonstrate originality and inventiveness in work and understand the real-world limits to adopting new ideas</td>
<td>Create new and worthwhile ideas (a both incremental and radical concept)</td>
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<tr>
<td>Resiliency</td>
<td>Elaborate, refine, analyze and evaluate their own ideas in order to improve and maximize creative efforts</td>
<td>View failure as an opportunity to learn; understand that creativity and innovation is a long-term, cyclical process of small successes and frequent mistakes</td>
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<tr>
<td>Engagement</td>
<td>Use a wide range of idea creation techniques (such as brainstorming)</td>
<td>Be open and responsive to new and diverse perspectives; incorporate group input and feedback into the work</td>
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</table>

On the other hand, Yien, Lin, Hwang, & Lin, (2011) recognized that all students are capable of creative thinking have high-level thinking since all students have the potential to be creative rather than being an inherent quality. Students have the capability to respond to innovation and elaborate on the idea to improve their creative thinking. Students may develop their creative thinking by creating the idea using the brainstorming method and incorporate with the external comment in generating the ideas.

**Research Methodology**

The observation procedure was done by the researcher to participants in five different classes who enroll for the MOOC Module. This observation procedure aims to observe the respondents attitude throughout the learning process. The unobtrusive observation was conducted where the researcher do not interact with respondents but rather simply record the behavior. (Baker, 2006) as stated in Gold’s (1958) complete observer and Gorman and Clayton’s (2005) unobtrusive observer play the same “passive” role where the researcher is present on the scene but, does not participate or interact with insiders to any great extent.

The researcher will record all the findings including the attitude, skills develop in the researcher’s observation notes (Appendix A). In completing the observation, the researcher were plotting the finding based on how many respondents respond to the statement given. The researcher select the random number of students from five classes to become the respondents for this method. The procedure will be adopted from the previous study to measure the development of students’ skills as indicator for the research instrument (Table 2). A self-complete observation form was used for data collection by plotting the relevant action shown by the respondents. To ensure reproducible result, the observation should be performed in a controlled environment where the students had an opportunity to reflect on the experience they gained while they actively engaged in the PBL activities. The processes were put in place to ensure the confidentiality of the participants.
Table 3.2: Instrument of Observation procedure

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<thead>
<tr>
<th>Instruments of Creativity skill</th>
<th>Multidimensional creativity self – efficacy Scale (MCSE)</th>
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<tbody>
<tr>
<td>i. Attraction to the complexity of the ideas</td>
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<tr>
<td>ii. Sources of idea generation</td>
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<td>iii. Fluency in voice out the idea</td>
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<td>iv. Show the originality of the idea</td>
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<td>v. Creative working style</td>
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<td>vi. Full concentration in finishing the task</td>
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Result/Discussion

Diagram 1

Frequency Table of observation result for creativity skills

Diagram 1 shows the values plotted as an indicator of creative skills. From the result, it can be seen that most of the respondents show their attitude toward the creativity statement which has higher percentage in the statement full concentration in finishing the task (93.4%) after the implementation of PBL through MOOC. Overall percentages of action shown support the interview and questionnaire distribution where the respondents have increased their creativity skill by implementing the PBL through MOOC. From the figure, 4.5 stated that 57.9% of respondents show the attitude toward creative working style, 56.6% show the originality of the idea, 62.5% show fluency in voice out the idea, and 59.2% become a source of idea generation and 51.3% show attraction to the complexity of the ideas.

The research supports the study from Moore (1997) that shows the positive aspect of creativity in providing an essential tool to provide a cohesive, task oriented classroom environment for students, and solve the problems. The creativity skills lead the students to become more comfortable and tolerant in classroom, able to voice out the idea, not afraid of being laugh by others in classroom, and able to handle mistakes. Other than that, students are able to give feedbacks among the group members, increase a sense of belonging and reduce the negative effect or vibes that conformity could be happen in a group. This situation may lead to the group task and spark the creativity among others and motivate them in cooperating with group members. To make sure this skills adapt into their attitude, the lecturer or educator play an important role to boost the student’s cohesiveness in promoting the creativity to confront the complex situation and find the solution independently.

The observation result shows the increasing level of skills development among the students after the
implementation of the PBL through MOOC. This is partly in keeping with the distribution of the attitude shown during the observation which resulted that the student increases the level of creativity skill.

Acknowledgements
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References
### APPENDIX A

**RESEARCHER’S OBSERVATION NOTE**

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<tr>
<th>Observation's criteria</th>
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<th>Finding / observation action</th>
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<td><em>Full concentration</em></td>
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<td><em>Fluency in voice out the idea</em></td>
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<td><em>Sources of idea generation</em></td>
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<td><em>Attraction to complexity</em></td>
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Observer’s Signature

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(Name/stamp/Date)