IMPLEMENTATION OF MIPBL FRAMEWORK FOR FUTURE TECHNOLOGISTS

Zanariah J.[1*], Faaizah S.[1], Hazmilah H.[1]
[1)] Centre for Technopreneurship Development , Universiti Teknikal Malaysia Melaka, Hang Tuah Jaya, 76100 Durian Tunggal, Melaka, Malaysia
[*]Corresponding e-mail: zanariahjano@utem.edu.my

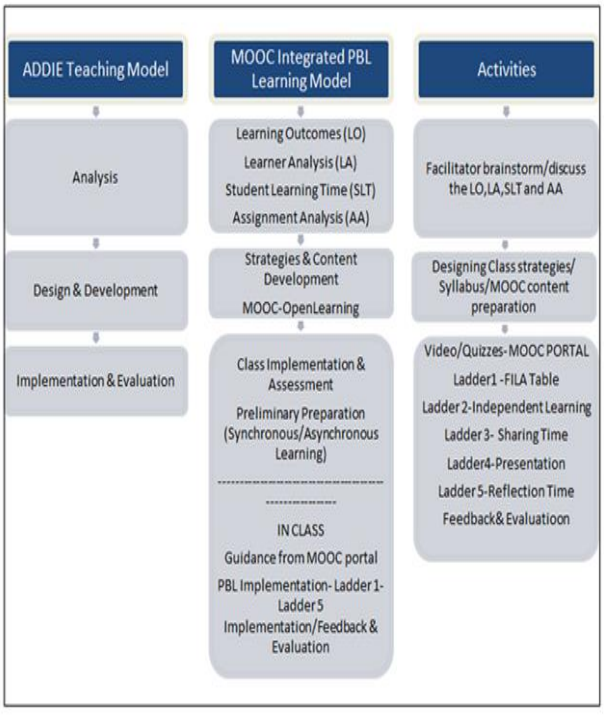
ABSTRACT

This paper had two fold objectives; to apply MIPBL in a class of future technologists at the Faculty of Engineering Technology and to assess students' perspectives on the effectiveness of the MIPBL framework. Questionnaires were developed for the purpose of investigating students' perceptions of effectiveness of soft skill implementation and determining feasibilty of promoting MIPBL. The MIPBL comprised modules and assesment kits. Samples consist of students of third year cohort of Engineering Technology Faculty. The findings yielded positive outcomes in terms of students' collaborative skills, engagement and motivation, higher order thinking and problem solving skills.

Keywords*: MIPBL; framework; technologists*

1. INTRODUCTION

Rapid evolution of technologies needs students to instill long life learning and self-learning skills to cater to today's demand of advanced technologies. However, much literature reveal the lacking of technical competence and soft skills among Asian graduates. To curb the problem, many innovation tools and approaches including problem based learning, Student Centred Learning, Project based learning have been devised to engage students for deep learning and inculcate develop essential skills like self-directed learning and problem solving. Most employers hire employees who are able to think critically and creatively, take risks and solve problems. Indeed, soft skills are essential in today's work environment. However, only few Asian employees possess these skills because most future employees lack of flexibility, adaptability, enthusiasm and motivation [1] (Manpower Group, 2013). Besides, another study highlighted the three most essential skills that leaders need today; managing change – 79%, negotiating and resolving conflict (68%), and collaborating with others (68%) [2]



(Cegos Group,2013).
Problem Based Learning together with Information and Communication Technology (ICT) tools is compatible for effective
process of teaching and learning.

MOOC and Problem Based Learning have been integrated into a framework known as MIPBL [3] . The main focus of the present study is applying the MIPBL tool designed previously into the Critical and Creative Thinking Class for future technologists at the Faculty of Engineering Technology. This study is timely because the teaching and learning process in institutions of higher learning in Malaysia are aiming for innovation-led industry realms.

1.2 MIPBL: How ICT Has Been Integrated

The development process of MIPBL (Jano, 2017) framework includes several phases and corresponding activities. Figure 1 highlight the framework.

Basing on Addie Teaching Model, the first phase comprises the analyses for Learning outcomes (LO), learner Analysis (LA), Student Learning Time SLT), Assignment Analysis (AA) where the activities consist of Facilitators brainstorm and detail the overview of LO,LA,SLT and AA. Next, Design and Development consist of Strategies and Content Development blended with the MOOC learning where activities reflect the designing of class strategies, syllabus, MOOC content preparation. The final phase covers the Implementation and Evaluation which include the preparation for Synchronous/ Asynchronous Learning and corresponding activities like video/quizzes-MOOC Portal, PBL implementation in classroom. Feedback and Evaluation are devised for each ongoing activity.
Figure 1: Learning Model for MOOC integrated PBL (MIPBL)

2. METHODOLOGY

2.1 Method
A mixed method approach was used namely quantitative approach through an experimental approach (Implementation of MIPBL) and a survey (questionnaires) as well as qualitative one (semi-structured interview) where students perceive their learning experience through MOOC integrated PBL framework. [4] Flynn (2005) stated that qualitative data yield the richness and validity of gathered data.

2.2 Samples
There were 7 PBL groups in this cohort of these engineering technologists. The samples were chosen through purposive sampling (3rd year students of Engineering Technology Faculty. 237 students participated in this study.

2.3 Procedure
The study employed a mixed method approach using action research, questionnaire and semi-structured interview The data were collected through the action research or implementation of MIPBL to the cohorts. Facilitators employed MIPBL in these PBL groups. Research site: Faculty of Engineering Technology.

2.4 Data collection
Research instruments used were questionnaire and semi-structured interview questions focused on the students' experience in using the MIPBL and their insights on the responses given in the questionnaires. The questionnaire data were analysed using descriptive statistics and the results are supported with insights obtained from the interview sessions.

3. RESULTS

3.1 Action Research

The development process of MIPBL (Jano, 2017) framework includes several phases and corresponding activities. The students comprised equal gender, ethnicity, state of origin, and academic status. A minimum of 8-10 hours were allocated for self-directed-learning (SDL) activities between Monday and Friday. In addition, between the PBL sessions, the students are provided with notes to scaffold the PBL curriculum. The PBL is mainly on the Green Innovation. Initially, the students underwent a preliminary PBL workshop where they were given an exposure to the PBL concept, the students' roles and responsibility of in PBL, the roles and responsibility of the facilitators in PBL and the Faculty's expectations. The students are also exposed to a simulated PBL followed by a MOOC presentation of the implementation of PBL for the course.

3.2 Survey via questionnaires

The findings yielded positive outcomes in terms of collaborative skills, engagement, motivation, higher order thinking and problem solving skills. Table 1 indicates the mean and standard deviation of each construct.

Table 1: The score of constructs

Construct	Mean	Std Deviation
Collaborative skills	4.09	.734
Engagement	4.01	.707
Motivation	4.11	.725
Higher order thinking	4.04	.772
Problem solving skills	4.06	.768

The result as a whole was relatively high (M > 4.0).

3.3 Qualitative data from the interview

The interview sessions with the respondents indicated that the students found the use of MIPBL was worthwhile because it generates all the skills namely collaborative skills, engagement, motivation, higher order thinking and problem solving skills. Some excerpts are as follows:

R1: MIPBL triggers group discussion among the member so we can discuss how to solve the problems;

R2: It makes us more engaged in the activities. We can retain information longer through pictures and audio; R3: It was not easy to use the technology due to unfamiliarity in the initial stage;

R4: Some of the technologies were hard to use at first but I got the hang of it, its ok.

R5: The server was slow.

4. SUMMARY

MIPBL is an effective teaching-learning tool. The findings yielded positive outcomes in terms of students' collaborative skills, engagement and motivation, higher order thinking and problem solving

skills. This study has revealed the positive influence of MIPBL tool. MIPBL can certainly help pave the path for active learning to take place where the acquisition of knowledge can be made more meaningful for students.

5. REFERENCES

[1] Manpower Group, (2013). Available online at: www.manpowergroup.com

[2] Cegos Group, (2013). Available online at: www.cegos.com.sg

[3] Jano, Z. (2018). Proceedings of Mechanical Engineering Research Day 2017, pp. 209-10.

[4] Flynn, T. (2005). Foucault's mapping of history. In G. Gutting (Ed.), The Cambridge Companion to *Foucault* (second edition) (pp29-45), Cambridge, U.K: Cambridge University Press.