Enhancing Learners' Creative Thinking in the Massive Open Online Course (Moocs) Learning Environment Model for Higher Education

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Abstract. This research was aimed to study the creative effect of the students who study with massive open online course (MOOCs) learning environment model for higher education. The target groups consisted of 20 juniors majored in Business Information Technology, Faculty of Information Technology, Sripatum University, Khon Kaen Campus, and 30 juniors Business Computer, Faculty of Business Administration, North Eastern University. Model Research consists of several types of research, including document research. Survey research and pre-experimental research one shot case study to examine the validity of the learning environment model and the success of using the learning environment model. The instruments used in the study consisted of experimental instruments and data collection tools. Perform quantitative data collection and qualitative. The data were analyzed using basic statistics such as percentage, mean, standard deviation. Protocol analysis Summary. Interpretation and analytical narrative. The results of the study found that the creative thinking of students studying with open online learning environment models (MOOCs) that promote creativity for higher education students. There are 60% of learners who pass the 60% criteria as specified. The students had average scores for creativity of 19.19, 20.76 and standard deviations of 0.54, 0.55.

Keywords: Creative thinking · Learning environment model · Massive open online course

1 Introduction

Currently, the labor market is quite affected by the global situation. Changes can happen at any time, according to a report from the World Economic Forum (WEF), predicting that in the next five years, workforces will face extreme conditions. Double-disruption Both from COVID and the use of automation, this impact could put workers with skills

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that don't meet the changing market demands at risk of losing their jobs: Creativity, originality and initiative – Creativity and Innovative Skills, which is an important skill [1]. Consistent with the results of the study, the 21st Century skills were summarized, learning skills and innovation that students focused on creative thinking. Using a variety of thought-building techniques creates new ideas [2] to enhance creative thinking are fluency, flexibility, originality, and elaboration [3] this will prepare you for future work skills. Changing the world in teaching and learning management, teachers should focus on enabling learners to learn on their own. By teachers to support and a paradigm shift in how to create knowledge through cognitive processes that focus on students to create knowledge by taking action through their thought processes. Connect prior knowledge with new knowledge and expand the cognitive structure and provide a learning environment that fosters the learner's knowledge-building process [4]. Using technology that is appropriate to the context. Use Massive Open Online Courses, which are characterized by an unlimited number of participants, an "open" system that anyone can take. MOOCs are an educational experience for learners and also improve the results of the study develop learners' learning skills and implement effective communication with teachers [5]. As mentioned previously. To study the creative effect of the students who study with massive open online course (MOOCs) learning environment model for higher education.

2 Literature Review

2.1 Creative Thinking

Guilford's Creativity (1967) was the basis for the study of the multidirectional thinking abilities of the brain. Called creative thinking that focuses on divergent thinking, which is the idea that leads to inventing new things. Including thinking and discovering solutions to problems successfully, consisting of 1) Fluency that mean the ability to create ideas for answers Fluently, quickly, in large quantities in a limited time and such as keyword of word fluency and ideational fluency 2) Flexibility that mean the ability to create a wide variety of ideas in a useful way and such as keyword of spontaneous flexibility and adaptive flexibility. 3) Originality is an application of design thinking for creating new ideas and 4) Elaboration is to create a detailed idea by creating evaluation criteria and adding details. Improved to make it better [3, 6].

2.2 Learning Environment Model

Learning environment model is a learning management that promotes learning in accordance with the needs of the learners, and facilitate the learners to be able to learn on their own through various learning resources, media by a combination of various theories and computer technology. To create knowledge (Knowledge Construction) to help support students' enthusiasm, opt-in Analyze and synthesize data and the Web based learning environment is a form of application, use internet network services which educators are very interested in nowadays Used to support teaching and learning management for maximum efficiency [7].

2.3 Massive Open Online Course

Massively Open Online Courses, or MOOCs, are defined as open learning systems that emphasize participation and broad reach in an unlimited number of learners. To enroll in classes and learn through online platforms [8]. Students can learn through video lectures or video tutorial content. And forums. That supports the design of a learning environment to enhance creative thinking.

3 Purposes

To study the creative effect of the students who study with massive open online course (MOOCs) learning environment model for higher education.

4 Method and Result

4.1 Scope of Research

This research is a model research type II model research of Richey & Klein (2007) [9] focusing on the creative outcomes of learners studying with an open online learning environment model. The research is divided into 3 phases (Phase), which are: Phase 1, Model development, Phase 2, Model validation, Phase 3, Model use, this time In phase 2, model development and phase 3, model use will be the presentation of research results in the study period.

4.2 Target Group of the Study

The target groups consisted of 20 juniors majored in Business Information Technology, Faculty of Information Technology, Sripatum University, Khon Kaen campus, to study the external validity that is the study of impact on learners when applying the learning environment model, and 30 juniors Business Computer, Faculty of Business Administration, North Eastern University. To study the use of the learning environment model. This is a study of the results resulting from the use of the learner's learning environment model, including creative thinking.

4.3 Research Design

The research model of the study in Phase 2, Model validation and Phase 3, Model use, used a variety of study methods. It consists of several types of research, including document research, survey research and pre-experimental research One shot case study to examine the validity of the learning environment model and the success of using the learning environment model.

4.4 Research Instruments

In this study, the researcher has created tools for use in the study and data collection, consisting of the following tools:

The model research in the Phase 2 study was to examine the validity of the learning environment model. External directness study Use a pre-experimental research model (Pre-experimental design) one-shot case study a tool used to examine external validity by using the Creativity Measure to study the creativity of students studying with the Learning Environment Model. The target groups consisted of 20 juniors majored in Business Information Technology, Faculty of Information Technology, Sripatum University, Khon Kaen campus.

The success of using the learning environment model using the creative thinking model. To study the creativity of students studying with the learning environment model. The target groups consisted of 30 juniors Business Computer, Faculty of Business Administration, North Eastern University.

4.5 Data Collection and Analysis

Data were collected in the Phase 2 study. The external directness of the model. The study from the impact of learners when applying the learning environment model to be used in learning management is the creativity of students. The process is as follows: 1) the learning management process: (1) clarifying and introducing learners about learning the learning environment model; (2) bringing them into lessons by linking learners' prior knowledge, with the subject studied (3) divide 20 learners into subgroups, 3–4 students per group according to the results of the study context (4) let learners learn with the learning environment model 2) Data collection The researcher collects the data after the learners Learn with a learning environment model. Let learners do a measure of creativity. 3) Data analysis consists of quantitative data analysis. And qualitative the researcher will present the data analysis. Student creativity the data were analyzed using basic statistical values, i.e. mean, standard deviation, and percentage, from the data obtained from the Student Creativity Scale. And using data analysis methods by protocol analysis, summary, interpretation.

Data were collected in the Phase 3 study to study the success of using the learning environment model. The application of the learning environment model in learning management is the creativity of the learners. The process is as follows: 1) the learning management process: (1) clarifying and introducing learners about learning the learning environment model; (2) bringing them into lessons by linking learners' prior knowledge. With the subject studied (3) Divide, 30 learners, into subgroups, 3–4 students per group according to the results of the study context (4) let the learners learn with the learning environment model. 2) Collect the data after that learner learns with the learning environment model let learners do a measure of creativity. 3) Data analysis consists of quantitative data analysis. And qualitative the researcher will present the data analysis. Student creativity the data were analyzed using basic statistical values, i.e., mean, standard deviation, and percentage, from the data obtained from the Student Creativity Scale. And using data analysis methods by protocol analysis, summary, interpretation.

4.6 Research Results

The creative effect of the students who study with massive open online course (MOOCs) learning environment model for higher education. In this study, the following results are presented: The scores obtained from measuring the creativity of students studying with the learning environment model. Obtained from the students' creativity measurement [3]. Using it with the target group in phase 2 of 20 people, it was found that the overall creativity score of a full score of 30 showed that 20 students received a score of 18 or more, representing 80.00% of the students. Dear all The mean score was 19.19 and the standard deviation was 0.54 and the creativity score for each aspect found that the ability to Fluency thinking had the highest mean score of 7.10 and the standard deviation was 0.49. Accounted for 71.00%, followed by the ability to creative thinking in Flexibility, Originality, and Elaboration with average scores of 5.40, 4.00, and 3.40, respectively, which shows that the average score of the learners passed the 60 hundred criteria as specified. As in Table 1.

Table 1. Post-study creativity scores of students studying with the learning environment model phase 2 model validations.

No.	Fluency		Flexibility		Originality		Elaboration		Total	%
	Score	%	Score	%	Score	%	Score	%		
1	8	80.00	7	87.50	4	66.67	3	50.00	22	73.33
2	6	60.00	5	62.50	4	66.67	4	66.67	19	63.33
3	6	60.00	4	50.00	4	66.67	3	50.00	17	56.67
4	7	70.00	5	62.50	4	66.67	4	66.67	20	66.67
5	8	80.00	5	62.50	4	66.67	3	50.00	20	66.67
6	6	60.00	5	62.50	4	66.67	4	66.67	19	63.33
7	8	80.00	5	62.50	4	66.67	3	50.00	20	66.67
8	6	60.00	5	62.50	3	50.00	2	33.33	16	53.33
9	8	80.00	6	75.00	4	66.67	3	50.00	21	70.00
10	8	80.00	6	75.00	4	66.67	4	66.67	22	73.33
11	7	70.00	7	87.50	5	83.33	4	66.67	23	76.67
12	7	70.00	7	87.50	4	66.67	3	50.00	21	70.00
13	8	80.00	5	62.50	5	83.33	5	83.33	23	76.67
14	7	70.00	6	75.00	4	66.67	4	66.67	21	70.00
15	8	80.00	4	50.00	5	83.33	3	50.00	20	66.67
16	5	50.00	4	50.00	4	66.67	4	66.67	17	56.67
17	6	60.00	4	50.00	3	50.00	2	33.33	15	50.00
18	8	80.00	6	75.00	4	66.67	3	50.00	21	70.00

(*continued*)

Table 1. (*continued*)

No.	Fluency		Flexibility		Originality		Elaboration		Total	%
	Score	%	Score	%	Score	%	Score	%		
19	8	80.00	6	75.00	4	66.67	4	66.67	22	73.33
20	7	70.00	6	75.00	3	50.00	3	50.00	19	63.33
									Total results	
$\bar{x}$	7.10		5.40		4.00		3.40		19.19	
S.D.	490		550		570		510			
%	7100		6750		6667		5667		97.63	
	Total number of learners (number)								20	
	Number of students who have passed the percentage criteria 60 (number)								16	
	Percentage of learners with a passing score percentage 60 (18 score)								00.80	
	Average score of students ($\bar{x}$)								19.19	
	Standard deviation (S.D.)								54.0	

- The scores obtained from measuring the creativity of students studying with the learning environment model, obtained from the students' creativity measurement Using it with the target group in phase 3 of 30 people, it was found that the overall creativity score of a full score of 30 showed that there were 26 learners who received a score of 18 or more, representing 86.67% of the students. Dear all with a gray mean of 20.76 and a standard deviation of 0.55 and a score of creativity in each aspect found that the ability to think creatively (Fluency) had the highest mean score of 7.28. The standard deviation was 0.57, representing 72.80%, followed by the ability to Flexibility thinking on the Originality) and Elaboration with average scores of 5.67, 4.08 and 3.63, respectively, which shows that the average score of the learners passed the 60 hundred criteria as specified in Table 2.

Table 2. Post-study creativity scores of students learning with learning environment model phase 3 model use.

No.	Fluency		Flexibility		Originality		Elaboration		Total	%
	Score	%	Score	%	Score	%	Score	%		
1	8	80.00	5	62.50	4	66.67	3	50.00	20	66.67
2	6	60.00	7	87.50	5	83.33	4	66.67	22	73.33
3	8	80.00	5	62.50	4	66.67	4	66.67	21	70.00
4	6	60.00	7	87.50	3	50.00	3	50.00	19	63.33
5	6	60.00	7	87.50	3	50.00	3	50.00	19	63.33

(*continued*)

Table 2. (*continued*)

No.	Fluency		Flexibility		Originality		Elaboration		Total	%
	Score	%	Score	%	Score	%	Score	%		
6	8	80.00	7	87.50	4	66.67	4	66.67	23	76.67
7	6	60.00	5	62.50	3	50.00	3	50.00	17	56.67
8	6	60.00	4	50.00	4	66.67	3	50.00	17	56.67
9	7	70.00	5	62.50	4	66.67	4	66.67	20	66.67
10	8	80.00	5	62.50	4	66.67	3	50.00	20	66.67
11	6	60.00	5	62.50	4	66.67	4	66.67	19	63.33
12	8	80.00	5	62.50	4	66.67	3	50.00	20	66.67
13	7	70.00	6	75.00	3	50.00	3	50.00	19	63.33
14	8	80.00	6	75.00	4	66.67	3	50.00	21	70.00
15	7	70.00	7	87.50	4	66.67	3	50.00	21	70.00
16	8	80.00	5	62.50	5	83.33	5	83.33	23	76.67
17	7	70.00	6	75.00	4	66.67	4	66.67	21	70.00
18	8	80.00	6	75.00	5	83.33	4	66.67	23	76.67
19	8	80.00	6	75.00	4	66.67	4	66.67	22	73.33
20	7	70.00	7	87.50	5	83.33	4	66.67	23	76.67
21	7	70.00	7	87.50	4	66.67	3	50.00	21	70.00
22	8	80.00	6	75.00	5	83.33	5	83.33	24	80.00
23	7	70.00	6	75.00	4	66.67	4	66.67	21	70.00
24	8	80.00	4	50.00	5	83.33	3	50.00	20	66.67
25	5	50.00	4	50.00	4	66.67	4	66.67	17	56.67
26	6	60.00	5	62.50	3	50.00	3	50.00	17	56.67
27	8	80.00	6	75.00	4	66.67	3	50.00	21	70.00
28	8	80.00	6	75.00	4	66.67	4	66.67	22	73.33
29	8	80.00	7	87.50	4	66.67	4	66.67	23	76.67
30	8	80.00	6	75.00	5	83.33	5	83.33	24	80.00
									Total results	
$\bar{x}$	7.28		675		084		633		76.20	
S.D.	570		480		520		580			
%	8072		8370		0668		4260		20.69	
	Total number of learners (number)								30	
	Number of students who have passed the percentage criteria 60 (number)								26	
	Percentage of learners with a passing score percentage 60 (18 score)								67.86	
	Average score of students ($\bar{x}$)								76.20	
	Standard deviation (S.D.)								55.0	

5 Conclusions

Results of the student's creative thinking who learned with massive open online course (MOOCs) learning environment model for higher education. There are 2 phases, Phase 2 and Phase 3 in this study, the results will be presented as follows: Phase 2, the scores obtained from measuring the creativity of students studying with the learning environment model [10]. Obtained from the students' creativity measurement. Using it with the target group in phase 2 of 20 people, it was found that the overall creativity score of a full score of 30 showed that 20 students received a score of 18 or more, representing 80.00% of the students. Dear all The mean score was 19.19 and the standard deviation was 0.54 and the creativity score for each aspect found that the ability to Fluency thinking had the highest mean score of 7.10 and the standard deviation was 0.49. Accounted for 71.00%, followed by the ability to creative thinking in Flexibility, Originality, and Elaboration with average scores of 5.40, 4.00, and 3.40, respectively, which shows that the average score of the learners passed the 60% as specified. Phase 3, The scores were obtained from measuring the creativity of students studying with the learning environment model [11]. Obtained from the students' creativity measurement Using it with the target group in phase 3 of 30 people, it was found that the overall creativity score of a full score of 30 showed that 26 learners received a score of 18 or more, representing 86.67% of the students. Dear all with a gray mean of 20.76 and a standard deviation of 0.55 and a score of creativity in each aspect found that the ability to Fluency thinking had the highest mean score of 7.28. The standard deviation was 0.57, representing 72.80%, followed by the ability to Flexibility thinking. Originality and Elaboration with average scores of 5.67, 4.08, and 3.63, respectively, which shows that the average score of the learners passed 60%.

Results of the student's creative thinking that learned with model showed 60% of the target passed at 60% of learning standard by the evaluation outcomes in research phase 2 and 3. Their average creative thinking evaluation and S.D. values were 19.19, 20.76, and 0.54 and 0.55 respectively. In addition, the protocol analysis of the creativity in those 2 phases illustrated that the students had such ability in terms of 1) Fluency 2) Flexibility 3) Originality, and 4) Elaboration.

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