
Project-Based Learning Model in Developing Creativity Support Environments in the Class of Entrepreneurship Education

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ABSTRACT

Creativity support environments (CSEs) and pedagogical model applied in entrepreneurship education are like two sides of a coin. Arguably, developing CSE cannot be achieved without supporting appropriate teaching learning. A conventional learning model just distorts the development of CSE. The most effective strategy for CSE development is to change the way of teaching. A strategy that could form a CSE is to provide active, constructivist, and collaborative learning and opportunities for improvisation. Theoretically, project-based learning (PBL) is potential to create CSE. This study aimed to test the effectiveness of a PBL model in comparison with a conventional model. The CSE, in this study includes campus learning situation and non-campus environment support, such as the support from lecturer and family. Special attention is paid to assess the student perception on CSE. In doing so, a quasi-experimental study involved public and private university students attending the entrepreneurship course was conducted. The results are expected to encourage a pedagogical transformation. A scale was developed to measure the variable of CSE before and after the treatment. An independent samples t-test was carried out on the posttest scores. The results of the study showed that there was no significant difference between the PBL model and the conventional model, but the gain scores in the experimental groups were higher. It can be concluded that CSE is not instantly formed but it is a process and needs a longitudinal study. Lecturers should be aware that the formation of CSE needs a sustainable effort.

Keywords: project-based learning, creativity support environments, entrepreneurship education

1 INTRODUCTION

A university might not be the right environment for the introduction of education in entrepreneurship and creativity (Rybnicek, Ruhri, and Suk, 2015). However, entrepreneurship has become a compulsory academic subject in many universities with students whose field of study is non-business education. The essence of entrepreneurship is creativity development. The growth of creativity requires an environment which is conducive to psychological security and psychological freedom. The environment is a factor which is efficient as instrument for creativity development (Susnea and Tataru, 2014). Ideally, the learning of entrepreneurship is implemented in congruence with the development of a creativity support environment (CSE). Entrepreneurship, as a relatively new academic subject for university students whose field of study is non-business education, is still packaged and taught theoretically and academically and still focused on the mastery of learning material; the

entrepreneurship learning so conducted could be said to be still conventional in pattern.

The advocates of the conventional pattern regard that Project Based Learning (PBL) only wastes the time and causes an uncontrolled learning atmosphere with no clear results. On the other hand, the innovators are convinced that the full freedom through PBL would develop a CSE which is conducive to the development of students' creativity. The conventional learning pattern is regarded as hampering and shackling so that it causes the learning environment to become insufficiently conducive to the development of students' creativity. In its implementation, PBL has more the look of being quite open and quite radical with its main focus on the end product. The fully free learning environment is believed able to stimulate students to become more creative.

The two entrepreneurship learning patterns appear to focus on, respectively, the mastery of material and the end product but both pay insufficient attention to the empirical experience felt by students. Research by Abduh, Maritz, and Rush (2011) indicates a low level of satisfaction with the learning of entrepreneurship conducted for the reason that, among others, the method in the learning is unable to create a learning environment that is conducive to creativity development. Individuals' creative ability is inseparable from the influence of culture and society (Munandar, 2009), all having the nature of being reciprocally influential to each other (Tsai, 2012; Yang and Zhong, 2012). The person–environment relation becomes compatible when individuals and characteristics of the work environment are well matched (Kristof-Brown and Guay, 2011). The consideration concerning the person environment being well matched is based on a tradition about interaction in the field of psychology declaring that individuals' behavior is a function of their characteristics and the environment where they do their activities (Jelena, Leona, and Vivian, 2015).

Rojanapanich and Pimpa (2011) finds that a factor that needs to be given particular attention to is change in policy, culture, and communication. The family is also a factor that influence on the formation of a CSE. A family that is democratic and without too many rules is good for creativity development (Munandar 2009).

The campus environment could be designed to be conducive to creativity development because theories about organizational creativity emphasizes the influence of the work environment role on the creative behavior of an individual or a team (Hasirci and Demirkan, 2003; Amabile and Conti, 1999). Strategies that could form a CSE have the characteristics of facilitating active learning, being constructivist and collaborative, and providing opportunities for improvisation (Sawyer, 2015). These characteristics fit the principles of PBL but PBL needs to be designed systematically. The implementation of PBL rests on students actively learning by doing (Wena, 2009) or using the active learning technique (Thomson and Joel, 2007). Creative behavior could

almost be predicted by the individual's characteristic of, among others, desiring a creative atmosphere. Satisfaction with the context is considerably influenced by environmental characteristics (Choi, 2004). Many instructors adopt PBL to develop learning achievement and provide a learning environment that draws learners' involvement (O'Sullivan and Krewer, 2015). A conducive work environment would be perceived by the individual and giving satisfaction is a moderator variable of creativity development (Jelena, *et al.*, 2015)

The specific research objective of this research was to study and prove empirically the effectiveness of a systematically designed PBL model in state university and private university in CSE formation measured according to the experience that students had after attending the learning activity. The CSE study was focused on the following aspects; involvement and participation in the learning conducted, the pattern of lecturer interaction, freedom in exploration, participation and collaboration, openness of lecturer attitude, and freedom in executing initiatives. The hypothesis presented was as follows: the PBL model performs better compared to the conventional model in CSE formation.

2 METHOD AND MATERIAL

The researcher choose the quasi-experimental design as approach (Scott and Usher, 2011), using the non-randomized control group pretest–posttest design or non- equivalent control group design, which is considered the most frequently used design in quasi-experiments (Salkind, 2006).

2.1 Participants

Four classes conducting entrepreneurship learning were purposively selected, consisting of two classes from the study program of history education at a state university and two classes from the program of primary school teacher education at a private university. The students in the state university and private university were chosen as experiment and control groups. Both of the groups were chosen randomly to determine as the experimental class and the control class and each group were chosen by drawing lots. The data of these participants are presented in Table 1.

Tabel 1: Data of research participants

	State university			Private university		
	<u>Male</u>	<u>Female</u>	<u>Total</u>	<u>Male</u>	<u>Female</u>	<u>Total</u>
Experimental groups	22	19	41	11	31	42
Control groups	25	17	42	13	22	35
<u>Total</u>	<u>47</u>	<u>36</u>	<u>83</u>	<u>24</u>	<u>53</u>	<u>77</u>

Average age			21.02			21.05
SD			0.72			0.89

2.2 Procedure

The experimental learning conducted in the research was project-based using the principle of learning actively, collaboratively, and systematically with the following learning procedure; exploration, implementation, realization, presentation, and reflection. Lecturer encouraged and suggested to the student the use of internet and Information and Communication Technology (ICT) based media during the project implementation. The use of ICT in education lends itself to more student-centred learning settings. Students working in groups of three to four individuals were obliged to attain the target of finishing projects of making creative products, in the form of either ideas, sketches, or prototypes of products.

2.3 Research Instruments

The instrument was developed with the following aspects as indicators: involvement and participation in the learning conducted, pattern of lecturer interaction, freedom in exploration, participation and collaboration, openness of lecturer attitude, and freedom in executing initiatives. Using as basis test of item validity with the Pearson Product-Moment correlation coefficient analysis, twenty-eight out of sixty items were found to be valid with a value of $r > 0.361$ (i.e., r_{table}), $\alpha = 0.05$, and $N = 30$. A test of reliability was applied on the twenty-eight valid items with all indicators being found to be represented in the items. The test used Cronbach's Alpha coefficient of reliability and the value obtained was $0.84 > 0.71$ (i.e., r_{table}).

2.4 Data Analysis

The inferential statistic method of using the independent samples t-test was employed to test the difference in post-test mean score between the experimental group and the control group paired. The data were transformed into an interval scale by using the Method of Successive Interval (MSI) of the Excel Program. The independent samples t-test was also applied on the pretest data to ascertain that there was no significant difference in score for CSE between the experimental group and the control group paired. The requirements for analysis of pretest and posttest data of the paired groups were fulfilled by means of the one sample Kolmogorov-Smirnov test of normality in data distribution and Levene's test of equality of variances (or homogeneity of variance) in data with $p > 0.05$.

3 RESULT AND DISCUSSION

3.1 Effectiveness of the PBL Model at the State University

Results of the independent samples t-test indicated that there was no difference in initial score for CSE between the experimental group and the control group at the state university, with $t_{obtained}$ of -1.641 in value being located within the region of acceptance ranging between -1.989 and +1.989, $p = 0.105 > 0.05$; and $df = 81$ (as shown in Table 2).

Table 2: Results of the Independent Samples t-Test on the Pretest Scores of the Two Different Groups at the State University

	Df (N-2)	Mean of pretest		SD		0.05 level	$t_{obtained}$	t_{table}
		Experimental group	Control group	Experimental group	Control group			
CSE	81	93.51	99.69	8.86273	6.83449	0.105	-1.641	1.989

The learning process well conducted, the projects were completed, and product prototypes were successfully made. Freedom in exploring caused the atmosphere of the learning conducted to become more open, encouraging participation, and voluntary contribution. The lecturer positioned himself or herself as learning partner and facilitator, kept reminding students of the targeted project, and gave input in weekly meetings. Through a questionnaire the students concerned gave response and 99% of them gave the evaluation that the PBL model was beneficial because it gave the opportunity for self-actualization, it was interesting, it was exciting (or “cool”), and it gave training in having responsibility, collaboration, and communication with various parties. These students gave such natural responses as the following statement: “the lesson is not clear but its enjoyfull... long live the entrepreneur spirit.” Each group concerned unexpectedly delivered respective slogans or mottoes of their own at the end of the presentation session. They are shown such as; “to fall is something ordinary, and to get up is something extraordinary” by Hoki Group, “only people who are afraid to lose never experience victory yet” by Wisuda Selo Group, “however great the past was, still greater is your future; however great your problem is, still greater is God” by Bunga Group, “failure is something ordinary but success is something extraordinary” by Mbanting Hape Group, and “tt is better to be poor in wealth than to be poor in science/ knowledge/wisdom” by Berkah Mania group.

The learning conducted ended with a posttest resulting in a mean score of 98.95 for the experimental group while the pretest mean score of the group was 93.51 so that there was a gain score of 5.44. The control group got a posttest

mean score of 96.68 while the pretest mean score for the group was 99.69 so that the gain score in this case was negative in value, namely, -3.01. The independent samples t-test on the posttest scores indicated that $t_{obtained} = 1.948$, which was still within the region of acceptance ranging between -1.989 and +1.989, with $p = 0.055 > 0.05$ and $df = 81$ (See Table 3). It was concluded that there was close to being statistically significant ($p=0.055$) in CSE score between the said two groups.

Table 3: Results of the Independent Samples t-Test on the Posttest Scores of the Two Different Groups at the State University

	Df (N-2)	Mean of posttest		SD		0.05. Level	$t_{obtained}$	t_{table}
		Experimental group	Control group	Experimental group	Control group			
CSE	81	98.95	96.68	7.16659	5.69075	0.055	1.948	1.989

3.2 Effectiveness of the PBL Model at the Private University

Results of the independent samples t-test on the pretest mean scores of the experimental group and the control group at the private university indicated that both groups started with equal conditions, with $t_{obtained} = 0.57$ (which was still within the region of acceptance ranging between -1.665 and +1.665), $p = 0.565 > 0.05$, and $df = 75$ (See Table 4).

Table 4: Results of the Independent Samples t-Test on the Pretest Scores of the Two Different Groups at the State University

	Df (N-2)	Mean of pretest		SD		0.05 level	$t_{obtained}$	t_{table}
		Experimental group	Control group	Experimental group	Control group			
CSE	75	98.17	97.15	7.66809	7.76623	0.565	0.578	1.665

The posttest mean score of the experimental group was 99.69 while the pretest mean score of the group was 98.17 so that there was a gain score of 1.52 and the posttest mean score of the control group was 97.38 while the pretest mean score of the group was 97.15 so that there was a gain score of 0.23 (See Tables 4 and 5). In the independent samples t-test on the posttest mean scores of the two groups, $t_{obtained} =$

1.383, which was within the region of acceptance ranging between -1.665 and +1.665, with $p = 0.171 > 0.05$, and $df = 75$ (See Table 5). It was concluded that there was no difference in final mean score for CSE between the two groups.

Table 5: Results of the Independent Samples t-Test on the Posttest Scores of

the Two Different Groups at the Private University

Df (N-2)		Mean posttest		SD		0.05 level	t _{obtained}	t _{table}
		Experimental group	Control group	Experimental group	Control group			
CSE	75	99.69	97.38	7.81328	6.58164	0.171	1.383	1.665

The testing of the PBL model effectiveness at both the state university and the private university did not indicate significant difference in effectiveness between it and the conventional learning model in use all this time. One would notice, however, that the gain score of the experimental group at the state university was slightly higher compared to that at the private university because $5.44 > 1.52$.

The analysis was continued with an effort to discover whether there was difference in posttest mean score between the two experimental groups. In the independent samples t-test on the posttest mean scores of those groups, $t_{obtained} = -0.449$, which was still within the region of acceptance ranging between -1.989 and $+1.989$, with $p = 0.687 > 0.05$, $df = 81$, and a difference in gain score of just 0.74 (See Table 6). It was concluded that there was no significant difference in final mean score for CSE between the state university experimental group and the private university experimental group.

Table 6: Results of the Independent Samples t-Test on the Posttest Mean Scores of the Two Experimental Groups

Df (N-2)		Mean posttest of experimental groups		SD		0.05 level	t _{obtained}	t _{table}
		State university	Private university	State university	Private university			
CSE	81	98.95	99.69	7.16659	7.81328	0.687	-0.449	1.989

The research findings indicate that there is no significant difference in CSE formation perceived by students between the PBL model and the conventional model. The experimental group being higher in gain score than the control group, however, indicates that the CSE formed via the PBL model is felt to be more conducive to creativity development compared to that formed via the conventional model. The condition could be explained by means of the consideration that, on one hand, the PBL model is indeed potential for CSE formation but, on the other hand, there are many challenges to confront and many factors that exert influence. The PBL model facilitates the active, collaborative, and constructivist principles of a learning model that makes a better CSE. The PBL model has the nature of fitting the characteristics of active, collaborative, and constructivist learning and provides opportunities for the formation of a creative environment (Sawyer, 2015). The 5 E's instructional

model, with the e for, in turns, engage, explore, explain, extend/elaborate, and evaluate, could give students an opportunity for thinking more creatively. The opportunity is in the form of an environment that stimulates creativity to develop (Akçay, 2013). In line with it, the procedure of the PBL model applied could be explained from three viewpoints.

First, the PBL model makes each student feel challenged to be actively involved in the procedure of exploration for ideas, idea evaluation and selection, idea development, idea presentation, and best idea actualization. Each presentation of project progress stimulates students to perform at their best in front of the class. The idea development stage stimulates them to actively seek information and try to make their idea different from any of the others. The challenge continues when they are to actualize the idea into a more tangible product. The ever present challenge to be active and become the best causes the learning environment to become exciting. The case is unlike that of the traditional learning pattern, in which the gain score of a control group was negative in value, meaning that the CSE concerned was not sufficiently perceived in a conducive way. In line with an opinion given by Muresan (2014), PBL is suitable for adults' education and it is an innovative and creative approach to problem solving through an actual learning environment.

Second, there is a process of psychological adaptation because the condition of a class that has never used a project-based learning model in a structured and systematic way requires adaptation. However, it so happened that the individuals in the experimental classes already positively perceived the CSE concerned though it did not attain a congruent level yet. According to Choi (2004), a CSE that already attains the level which is hoped for and perceived congruently by individuals is the critical condition for creativity to develop. Notes and students' opinion also indicate a positive attitude but it could not yet come to the level of satisfaction with context. It means that in some cases the CSE put forth already fits students' desire but it does not yet reach the level of satisfaction with the CSE enveloping them and satisfaction with a CSE is greatly influenced by the factor of environment. The process has the nature of being reciprocal and, as explained by Jelena *et al*, (2015), an individual's behavior is a function of the individual's characteristics and the environment where the individual does his or her activities.

Third, the relation between the individual and the CSE is influenced by not only the learning situation and experience in the classroom but also many other factors, including the environment outside the classroom and learner personality characteristics. According to Yang and Zhong (2012), the environmental factors with very widespread influence as seen from the macro-perspective include the natural environment and the social environment, besides the personality factor operating within oneself as self-environment. Amabile (1995) states that the attributes that could improve creativity are not only in the campus environment but also in the family environment. In addition, key figures also exert influence. The project assignment in the experimental

group obliges interaction with many figures, besides lecturers, like business people, public figures, and partners outside the circles of figures within the campus. It means that CSE forming in the classroom is inseparable from the macro-environment, personality, and figures of people outside the campus environment.

Fourth, the application of the structured PBL model requires adaptation in which learners should obey the guidebook, complete the targeted project in accordance with the time allocation, and safeguard team cohesiveness. According to O'Sullivan and Krewer (2015), though PBL is more enjoyable than traditional learning, there are still challenges related to the understanding of what a project is and the availability of the equipment required, the process of adaptation to a more structured PBL approach, the availability of guidance in each important stage of the project, and the openness of the evaluation of the individuals in a team. It means that PBL implementation should be really planned to be systematic and structured but still based on constructivism and active, collaborative, and reflective learning to have significant benefit. Moderate constructivism could become a foundation of anything where freedom and autonomy are given but a strategy should be constructed.

4. CONCLUSION

The PBL model is potential of having a better performance in developing a CSE. This research also proved that PBL with ICT could bring positive gains due to student's environmental and technological beliefs. It is potential of achieving a CSE that is congruent with what the learner hopes for. However, it needs to be realized that CSE formation is a transformation that requires process and time. The learner's perception of the CSE should be felt as an experience that is important to be revealed in order to be able to be made the basis for improving the performance of the PBL model so that it reaches a level in which there is congruence between the hopes of the individuals and the environment enveloping them.

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