Effectiveness of the PKBP Learning Model (Experience-based Entrepreneurship Education) in the Technopreneurship Course at Home Economics Department of Engineering Faculty UNNES

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ABSTRACT

Business interest is a subject's internal inclination to be interested in creating a business and then organizing, managing, bearing risks, and developing the business being created (Subando, 2017). The problems of this study are 1) the number of businesses developed by FT UNNES students is still low, 2) the weaknesses in the learning process, specifically many students have not been able to improve their understanding of certain concepts, 3) inputs from UNNES students, most of whom aspire to become teachers, consequently students' awareness of entrepreneurship is considerably low, 4) students take Technopreneurship courses merely to complete the KRS obligations. The purpose of this study is to determine the effectiveness of technopreneurship courses at the Home Economics department of FT UNNES. The type of study being conducted was a quasi-experimental study with the application of randomized matched two group pretest-posttest as research design. The population of this study was all students majoring in Home Economics FT who were taking the 2022/2023 Technopreurship course, a total of 165 students. The sample consisted of 2 selected classes as an experiment class with a total of 85 students and 2 more classes as a control class with a total of 80 students. The instrument used in this study was a written test instrument with the following indicators: entrepreneurial interest, entrepreneurial attitude, and creative thinking. The results of the study indicated that the PKBP learning model is effective in increasing entrepreneurial interest, entrepreneurial attitude, and creative thinking of UNNES students majoring in Home Economics.

Keywords: *PKBP learning model, technopreneurship*

1. INTRODUCTION

The Technopreneurship course discusses various studies related to entrepreneurship which equips graduates to work in both educational and non-educational fields, especially as entrepreneurs with technology support [1]. The problems of this study are: 1) poor quality of learning process, specifically there are still many students who have not been able to improve their understanding of certain concepts, 2) the inputs from UNNES students; most of whom aspire to become teachers, consequently students' awareness of entrepreneurship is considerably low, 3) the Technopreneurship courses are conducted using classical learning model, 4) students' ability in keeping up with technological developments is considerably low, and 5) students take Technopreneurship courses only to fulfill their KRS obligations. Based on from the phenomena and research problems described above, a study on the effectiveness of PKBP (Experience-based

Entrepreneurship Education) learning model towards students at the Faculty of Engineering, Semarang State University, especially in the Department of Family Welfare Education, will be carried out. The PKBP (Experience-based Entrepreneurship Education) learning model is part of experience-based learning (experiential learning) [2]. It is a learning model that activates students' thinking in building knowledge and skills through direct experience or learning through action. Furthermore, this method will accommodate and provide feedbacks and evaluation in relation to the implementation results and what needs to be done.

The main theory as State of the Art in this study is constructivism learning theory, which is a learning process that pays attention on how concepts are formed by students using reasoning skills and bringing together components that relatively can be

measured and identified in exploring real knowledge. Constructivism requires teacher creativity and students' eagerness in building concepts that are suitable with the expected goals [3]. Constructivism learning theory builds new knowledge that should be explored so that students can discover appropriate solutions to problems on their own [4]. The constructivist perspective is often referred to as the main concept in a learning theory [5].

The basic principles of the previous studies are: 1)Technopreneurship is the synergy between   of Entrepreneurship course values and technology [6]. 2)The Technopreneurship learning process will be accomplished if it is supported by appropriate curriculum, effective learning methods, and good management [7], 3)Technopreneurship is an entrepreneurial process which is initiated with innovation [8]. 4)Technology-based entrepreneurship education (technopreneurship) is one of the efforts to synergize theory and practice rooting from various competencies in scientific fields related to technology and industry [9]. Therefore, technopreneurship education can be applied as a learning process within a business atmosphere, 1) improvement of knowledge through experience-based learning [10], 2)experimental learning is effective in developing student discipline [11], and 3) the productive courses use learning models inquiry appropriately [12].

2. RESEARCH METHOD

The type of this study is a quasi-experimental with the application of randomized matched two group pretest-posttest as research design. The experimental method was being used to examine whether an influence was occurring by giving treatment to the experiment class; the results were then compared to the control class. This design was selected because alteration towards the existing classes was not possible during the experiment [13]. The difference in learning outcomes between students taught using the PKBP (Experience-based Entrepreneurship Education) learning method and conventional learning method will be identified as one of the objectives of this study. This is an experimental study with 2 different treatments and a survey; thus it can be referred as experimental study by level. The statistical methods being applied in data analysis of the learning model were the independent samples t-test and G-score [14].

Table 1. Research Design

Class	Pre Test	Treatment	Post Test
Experiment Class	O_1	X	O_2
Control Class	O_3	-	O_4

Description:

O_1&O_3 = Experiment Class and Control Class were given Pre-test

O_2 dan O_4 = Experiment Class and Control Class were given Post-test

In this study, PKBP (Experience-based Entrepreneurship Education) learning was applied to the Technoprenuership course for one semester. The learning process began with 1) preparation of activities, including: provision and providing stimulation and motivation to students to understand entrepreneurship, 2) core activities (exploration and elaboration), including: Students worked individually and learned from their experiences by opening independent business, 3) closing activities, including: students made presentations based on their experiences in relation to the theories or learning materials in order to expand their experiences and understanding and made business reports.

The performance indicator in this study was based on the fact that the PKBP (Experience Based Entrepreneurship Education) learning model could be an effective learning model. The assessment indicators included: student's entrepreneurial interest, entrepreneurial attitude, and creative thinking. Valid indicators of the success of this learning model can be presented by the following indicators:

1. At least 70% of students could understand technopreneurship material effectively.

2. There was learning conduciveness in entrepreneurship education

3. Suitability of learning methods to the material being taught.

The population in this study was all students from the Home Economics Department of the Faculty of Engineering who took Technopreneurship courses in the even semester of 2022/2023; with a total population of 165 people from 4 classes. A simple random sampling technique was conducted which resulted in 2 selected sample classes namely classes of E1 and E2 as experiment classes that applied the PKBP learning model and classes of K3 and K4 as control classes that applied conventional learning models.

The data analysis technique was quantitative. Data analysis requirements were tested using the normality test and homogeneity test. Additionally, the mean difference of the independent sample t-test was analyzed.

The mean absolute test was applied to determine whether or not there were differences (similarities) in learning outcomes after being given treatment towards both experiment class and control class. The mean difference test formula being applied was as follows.

$$t = \frac{\overline{X_1} - \overline{X}_2}{\sqrt{\dfrac{s_1^2}{n_1} + \dfrac{s_2^2}{n_2}}}$$

(Sugiyono, 2015)

Description:

$\overline{xx_1}$: Average score of the experiment class

$\overline{x_2}$: Average score of the control class

The statistical hypothesis in this study was as follows:

Hypothesis 1   H0 : μA1 = μA2

                H1 : μA1 ≠ μA2

Hypothesis 2   H0 : μB1= μB2=μB3 = μB4

                H1 : one of them was indicated ≠

Effectiveness test was carried out using the N-Gain formula. The Gain index criteria are:

1. Score (g) ≥ 0.70 high category;
2. Score 0.30 ≤ (g) ≥ 0.70 moderate category;
3. Score (g) > 0.30 low category.

The effectiveness criteria used the following criteria:

1. If the effectiveness ≥ 1, thus the CTL learning model was effective in improving the learning outcomes in history subjects
2. If effectiveness < 1, thus the CTL learning model was not effective in improving the learning outcomes in history subjects.

3. RESULTS AND DISCUSSION

The investigation on the Effectiveness of the PKBP Learning Model in Technopreneurship Courses for Home Economics Department Students, Faculty of Engineering, Semarang State University can be presented as follows:

3.1. Data Analysis Results

3.1.1. Analysis of Student Conditions

There were 165 students of the Family Welfare Education Department of UNNES who took Technopreneurship courses in the even academic year of 2022/2023 as presented in the following table:

Table 2. Number of students in Technopreneurship courses

No	Courses	Programs	No of Stdt
1	Technopreneurship	Beauty Art	47
2	Technopreneurship	Beauty Art	47
3	Technopreneurship	Fashion Design	38
4	Technopreneurship	Fashion Design	33
	Total Students		**165**

Total of 165 students were divided into 4 different classes with the same lecturer. The treatments in this study were as follows:

1. Students of Beauty Art and Fashion Design Education referred to as class E1 and class E2 were designated as experiment classes, totaling of 85 students.

2. Students of Beauty Art and Fashion Design Education referred to as class K1 and class K2 were designated as control classes, totaling of 80 students.

Before the experimental research was carried out, a pre-test was conducted, both towards the experiment classes (treatment) and the control classes to determine the students' achievements before being given treatment. After a certain period of time, a post-test was conducted to measure the learning outcomes obtained in the Technopreneurship course, both in the control classes and the experiment classes.

3.1.2. The Results of Student Scores

The resulting scores of the control class and experiment class are presented in the following table:

Table 3. Technopreneurship student resulting scores on pre-test and post-test of control class and experiment class.

Class		N	Mean
Control class	Pre test	80	59.8
	Post test	80	88.5
Experiment class	Pre test	85	62.6
	Post test	85	89.2

Subjects in pre-test of the control class were 80 students. The pre-test results for the control class; the lowest score was 42 and the highest score was 93. Using the SPSS computer program, it was observed that the average (mean) score achieved by the control class students during the pre-test was 59.8; and the mean pre-test score of the experiment class was 62.6

Subjects in post-test of the experiment class were 85 students. The post-test results for the control class; the lowest score was 50 and the highest score was 96. Using the SPSS computer program, it was observed that the average score (mean) achieved by the control class students during the post-test was 62.6; and the mean post-test score of the experimental class was 89.2.

3.1.3. Description of Normality Test Data

Based on the terms of statistical calculations using the normality test formula, the data indicated the value of $x^2\ h4tung < x^2\ ta$. Based on the terms of normality test using the x^2 (chi square) goodness-of-fit test, it can be concluded that the data of pre-test and post-test for each class (experiment class and control class) was normally distributed with a confidence level of $\alpha = 0.05$ and degrees of freedom (dk) = n-1.

3.1.4. Description of Homogeneity Test Data

Based on the calculation results using the homogeneity test value formula, the value obtained was 胏 $_{h4tung}$ < 胏 $_{tabel}$, thus the variance of the data from both experiment classes and control class was homogeneous. The result of variance homogeneity test of the pre-test and post-test was at confidence level of $\alpha = 0.05$

3.1.5. Description of the Mean Difference Test Data

Independent Samples T-Test

Based on the results of the normality and homogeneity tests, it was found that the data in the experiment class and control class were normally distributed. It was followed by testing the hypothesis using the independent samples t-test formula to determine the influence of the PKBK learning model on the interests, attitudes, and creative thinking of UNNES students majoring in Home Economics.

The t-test analysis of the post-test data using the post-test value obtained a value of 5.3 which was greater than t-table. It can be concluded that the PKBP learning model had an influence on the interests, attitudes, and creative thinking of UNNES students majoring in Home Economics. This

conclusion was based on statistical calculations at a confidence level of $\alpha=0.05$, and degrees of freedom (dk=66).

3.1.6. Description of Effectiveness Test Data

Based on the calculation results using the effectiveness formula, the results in the following table were obtained:

Tabel 4. Gain Score Results

N Gain	Scores	Category
Experiment class	0.58	Moderate
Control class	0.38	Moderate

Table 4 indicates that the N-Gain score obtained from the experiment class was 0.58 which fall in the "Medium" category, while the N-Gain score obtained from the control class was 0.38 which fall in the "Medium" category.

After obtaining the N-Gain scores, the next step was calculating the effectiveness of the PKBP learning model. The calculation results using the effectiveness formula obtained a score of 1.9. The effectiveness test criteria suggested that if the obtaining score was more than 1, then the PKBP learning model was considered effective in improving interest in entrepreneurship, student attitudes, and creative thinking among UNNES students majoring in Home Economics.

3.2. Discussion

3.2.1. Entrepreneurial Attitude after Technopreneurship Learning Using PKBK.

There was a significant difference in the entrepreneurial attitudes of Home Economics students of UNNES before and after learning technopreneurship. Technopreneurship learning using PKBK was able to change students' entrepreneurial attitudes. It was also observed that the results of descriptive analysis increased by 10.7%. This indicates that technopreneurship learning using PKBK is appropriate and suitable to be applied to students. The results of this study were in line with the study conducted by Andhika Wahyudiono (2016) and Satriyanto Wibowo and Komang Agus Satria Pramudana (2016), which stated that entrepreneurship education has a positive and significant effect on students' entrepreneurial attitudes. The purpose of entrepreneurship education is to prepare students so that they have an entrepreneurial attitude and mentality.

3.2.2. Creative Thinking after Technopreneurship Learning Using PKBK.

There was a significant difference associated with creative thinking of Home Economics students of UNNES before and after technoprenuership learning. Creative thinking is the ability which stimulates, facilitates, and supports someone's behavior so that they are willing to work more actively and enthusiastically to achieve optimal results (Hasibuan, 2016). The entrepreneurship learning carried out at Home Economics Department of UNNES currently has been able to improve students' creative thinking. Based on the descriptive analysis results, student's creative thinking increased by 10.9%. By improving students' creative thinking in entrepreneurship, it is hoped that students will be able to leverage their creativity in building a business. Entrepreneurs need to think creatively, because the business will grow well along with the owner's creativity. An entrepreneur's creative thinking is required to change the way of running a business and produce new products or services in accordance with market developments; in other words, creating products and services that are accepted by the market. This study supports previous study conducted by Acar, Tadik, Myers, Sman, and Uysal (2020), which stated that there is a significant relationship between creativity and psychological well-being [19].

3.2.3. Entrepreneurial Interest after Learning Technoprenuership with PKBK

There was a significant difference in students' entrepreneurial interest before and after the technoprenuership learning using PKBK; there was an increase by 8.8%. After taking part in technoprenuership learning using PKBK, the number of students who experienced improvement associated with entrepreneurial motivation was as much as 86.3%. Technoprenuership learning using PKBK was proven to have an impact on students' entrepreneurial interest. This study supports the results of previous studies conducted by Paulus Patria Adhitama (2014) and Anwar Daniel (2017) which stated that entrepreneurship learning has a positive and significant influence on students' interest in entrepreneurship, meaning that well-conducted entrepreneurship learning tends to encourage interest in entrepreneurship.

4. CONCLUSION

Based on the results and discussion of the study, it can be concluded that: the PKBP learning model is effective in increasing entrepreneurial interest, entrepreneurial attitudes, and creative thinking of UNNES students majoring in Home Economics.

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