



## The Effectiveness of Entrepreneurship Teaching Materials for Engineering Students at Faculty of Engineering of Universitas Negeri Semarang

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DOI: 10.15294/dp.v11i2.8933

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### History Article

Received 3 October 2016  
Approved 3 November 2016  
Published 17 December 2016

### Keywords

Effectiveness; Entrepreneurship Teaching Materials

### Abstract

This research aims to test the effectiveness of entrepreneurship teaching materials for students majoring on Family Wealth Education Department at Faculty of Engineering, Universitas Negeri Semarang. Entrepreneurship teaching materials were developed by researchers by using ADDIE model, and the research only focused on the effectiveness of entrepreneurship teaching materials. It was a quasi-experimental study with a before-after or one group pretest-posttest technique. The research was conducted for 4th semester students of Family Wealth Education Department who studied entrepreneurship subject. In the experimental group, students were taught by teaching materials which were developed by the references of entrepreneurship subject on Higher Education and also was adapted by the conditions of students. Data were collected by using test, questionnaires and learning observation sheets. To test the hypothesis, it used paired t-test analysis and gain-score testing to measure the effectiveness of teaching materials in supporting the Entrepreneurship subject at Family Wealth Education Department of Faculty of Engineering. Findings show that the entrepreneurship teaching materials are effective and the results of other analysis show that students' scores are increased from pre-test to post-test who were taught with Entrepreneurship teaching materials.

### How to Cite

Rachmawati, R. (2016). The Effectiveness of Entrepreneurship Teaching Materials for Engineering Students at Faculty of Engineering of Universitas Negeri Semarang. *Dinamika Pendidikan*, 11(2), 136-142.

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p-ISSN 1907-3720  
e-ISSN 2502-5074

## INTRODUCTION

Learning is a self-generating life necessity. It means that "one should make an effort for him or herself". Since birth, human beings are encouraged to survive. Human being should continuously learn to achieve their independence and adapt to various environmental changes (Semawan, 2007). Learning may be performed through various ways in various conditions, either at formal, informal, or non-formal education system. One formal learning example is that at a higher education institution (university).

A university has an important role to develop people's intelligence, covering knowledge, experience, and attitude. One of them is entrepreneurship which is taught at university. One underlying reason why entrepreneurship is learned at university is due to a phenomenon that the unemployed educated people are increasing in number, especially university graduates. The Deputy Assistant for Youth Pioneering of the Ministry of Youth and Sports, Muh Abud Musa'ad, states that the number of unemployed educated youths has already reached 41.81 percent of the national unemployment rate. The greatest number of unemployed educated people is from university graduates (12.78%) followed by that of Senior High School Graduates (11.9%), of Vocational High School graduate (11.87%), of Junior High School Graduate (7.45%), and of Elementary school Graduate (3.81%). The number of unemployed youths in Indonesia is also considered high when compared with that in other countries. The number of unemployed youths in Indonesia has reaches 25.1% of the overall work forces. The number of unemployed youths in Indonesia has been ranked at the second-highest one after South Africa. This fact shows that the higher the education level, the lowest the entrepreneurial value and spirit (as stated by the Directorate-General of Education at the sixth National Convention for Indonesian Education in Denpasar, November 17-19, 2008). This is one particular problem which becomes a consideration that entrepreneurship should be included in the curriculum of higher education institutions (universities).

The primary objective that entrepreneurship course should be included in the curriculum of higher education institutions is to develop the entrepreneurial cultures among academicians. It is expected that educated entrepreneurs are resulted from those academic community environments, not only as job seekers, but also job creators. Competitive entrepreneurs are those equipped with entrepreneurial attitudes, skills,

and mentality supported with entrepreneurial knowledge, experience, and attitude as taught at higher education institutions.

The next objective of entrepreneurship course at higher education institutions is dealing with students' entrepreneurial spirit. The entrepreneurial spirit is not only based on entrepreneurial spirit, but also character which are applied in the daily life, such as being creative and innovative. It is expected that entrepreneurship course may develop students' creative and innovative spirit, to apply in various daily life activities. Arasti (2012) explains that entrepreneurship education covers the entire aspects designed to develop the entrepreneurial mindset, skills and attitudes, including entrepreneurial new ideas, developments, and innovations.

Those views eventually make entrepreneurship course considered as an important part of education in higher education institutions. One objective regarding to the implementation of entrepreneurship course is explained by Albertiet al. in Arasti (2012) stating that entrepreneurship education aims to improve knowledge dealing with entrepreneurship, including development of business skills and techniques, analyses, planning, risk reducing abilities, entrepreneurial empathy buildings, supports and courage. In addition, the development of entrepreneurship skills may also train someone's entrepreneurial characteristics, as explained by Suhermini (2010) explaining that someone's entrepreneurial characteristics include confidence, result-oriented, risk taking courage, leadership, innovation, creativity, and future-oriented.

One main component which has an important role in supporting the success of the educated entrepreneurship program is the teaching staff (lecturer). Lecturer as class facilitator should have creative and innovative attitudes in planning their classroom learning. Numerous efforts are made to improve creative and innovative learning, including learning media planning as the teaching material guidance. Learning media are agents which deliver messages or information for instructional purposes or learning intentions between sources and recipients (Arsyad, 2011). One component of learning media is teaching material. Teaching material is a message core component of curriculum that should be delivered to students. Good and complete teaching materials may be used by the students in the classroom (with a teacher or lecturer) or outside the classroom (without a teacher or lecturer) as a form of lifelong learning concept. Teaching materials may serve as an independent learning material

when sophisticatedly and completely designed.

Entrepreneurship learning material is developed and studied aiming to increase basic competence mastery, covering (1) introduction to values and concepts; (2) establishment of principles, legal business regulations, and theories; (3) introduction to realities, actual information, and business objects; and (4) development of competences on skills to take actions by having more decision making training on entrepreneurial actions (Suharsono, 2006).

Semarang State University is one reputable university in Indonesia known as a conservation university. Conservation is the indeed vision "becoming a healthy, excellent, and prosperous international-standardized conservation university. As a former Institute of Teachers Training and Educational Sciences (IKIP), Semarang state university pays more attention to the fields of education. Of 59 study programs, 34 study programs are in the fields of education with a bachelor degree in education (S.Pd). Entrepreneurship course has been included in the curriculum of Semarang State University. Of the existing 59 study programs many of them have included entrepreneurship course in their curriculum. The Entrepreneurship course is organized by each department that automatically it is adjusted with the learning material of each department that entrepreneurship course is not classified into a General Course.

One lecturers' challenge in teaching the entrepreneurship course at Semarang State University is dealing with the input of students whose intention is to become teachers. Students expect and are expected by their parents that by studying at Semarang State University, they may obtain a degree in education and become a teacher (Rina Rachmawati, Tracer Study research results in 2012). Therefore, when taking entrepreneurship course, the students' focus is only to complete the minimum score of course requirement (KKM). Students' awareness to become entrepreneur is still poor. Encouraging and boosting students' interest to create business is the teachers' (lecturers') challenge at Semarang State University. The learning method and media are the supporting factors upon the success of particular instructional purposes of entrepreneurship course. The appropriate learning method and media which are interesting, communicative, and based on students' characteristics may improve students' interest to become entrepreneur.

In fact, lecturers for entrepreneurship course at Semarang State University have not had a complete and standardized manual on entrepreneurship teaching materials at higher education

institutions. The learning media used have also not been interesting and innovative. One learning media used is the entrepreneurship teaching materials. Entrepreneurship teaching materials which are well designed, innovative, and complete may provide contribution to improve students' interest and desire to participate in entrepreneurship. Appropriate teaching materials should be based on the environment of a conservation university that it is expected the educated entrepreneurs may create job opportunities (as job creators).

Based on above explanations, sustainable researches should be conducted. This article is a part of the research results on teaching materials development for entrepreneurship course with ADDIE model for entrepreneurship students of Semarang State University funded by the Directorate of Research and Community Services, Directorate General of Research and Development Reinforcement, Ministry of Research, Technology, and Higher Education, in accordance with the Assignment Agreement of Research Program Implementation. This research requires a 2-year long research period starting with the following research stages: Analysis, Design, Development or Production, Implementation or Delivery, and Evaluation. In the first year (2015), the conservation-based entrepreneurship teaching materials are developed. The teaching materials are organized and considered applicable by expert judgment, and tested in a small entrepreneurship class. In the second year (2016), the researcher proposes further study to continue and develop more the teaching materials for entrepreneurship course with ADDIE model to the fourth and fifth stages: Implementation and Evaluation. This article explains the evaluation stage for the effectiveness of teaching materials for entrepreneurship course, applied at Department of Service and Production Education (Family Prosperity Education/PKK), Engineering Faculty of Semarang State University.

The entrepreneurship teaching materials designed in the first year (2015) which has been adjusted to the cultures and students of Semarang State University is as Table 1.

The further research purpose is to implement the conservation-based entrepreneurship teaching materials of entrepreneurship course at Engineering Faculty of Semarang State University. The entrepreneurship teaching material book is then analyzed using a development research conducted with ADDIE model (Analysis, Design, Development or Production, Implementation or Delivery, and Evaluation). In addition, this research measures the effectiveness of the entrep-

reneurship teaching materials at Engineering Faculty of Semarang State University.

This research important urgency is the realization of entrepreneurship teaching materials as an entrepreneurship learning guidance at Semarang State University. In addition, the entrepreneurship teaching materials are expected to meet the environmental conditions and students of Semarang State University. Further research is the support of previous research and is developed based on entrepreneurship teaching materials development with ADDIE model at Semarang State University.

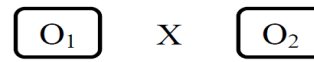
**Table 1.** Entrepreneurship Course Competence Guidelines of Semarang State University

Competence	Materials
Introduction to concepts and values	<ul style="list-style-type: none"> <li>• Entrepreneurship Concepts</li> <li>• Self and self recognition concepts</li> <li>• Business Concepts</li> </ul>
Establishing principles, business regulations, and theories	<ul style="list-style-type: none"> <li>• Leadership</li> <li>• Communication</li> <li>• Business ethics</li> </ul>
Introduction to realities, actual information, and business objects	<ul style="list-style-type: none"> <li>• Business environments</li> <li>• Enterprises and business types</li> <li>• SMEs</li> <li>• Franchises</li> </ul>
Competence Development of Expertise skills	<ul style="list-style-type: none"> <li>• Marketing</li> <li>• Finance</li> <li>• Business plan</li> </ul>

**METHODS**

This research is conducted on 22 students of semester 4 of Family Prosperity Education Department (PKK) of Engineering Faculty of Semarang State University in the Academic Year of 2015/2016. The experimental design uses a before-after technique or one-group pretest-posttest design (Sugiyono, 2014). This research experimental procedure is initially conducted by having a preliminary test on students taking entrepreneurship course that pre-test scores are obtained. Furthermore, those 22 students participate in entrepreneurship course using and following the entrepreneurship material guidelines that students have entrepreneurship materials as their learning materials. A post test is then conducted after participating in the entrepreneurship course

with a total of 14 meetings; the results of this test are then called post-test scores. The experimental design is shown in the following figure.



**Figure 1.** Experimental Design (Before-after)

Figure 1 explains that O<sub>1</sub> is before treatment and O<sub>2</sub> is after treatment, while X is the treatment, on the use of conservation-based entrepreneurship teaching materials organized with ADDIE method.

The results of this experimental research are divided into two outputs. The first output is to generate conclusion on how entrepreneurship teaching materials are organized to improve learning achievement. The second output is to understand the effectiveness of entrepreneurship teaching materials implementation.

The research data are first collected using questionnaire techniques to obtain the teaching materials practicality data, and second, essay test with 29 question items for pre-test and post-test. Data analysis is used to determine the influence/effectiveness before and after treatments using a gain score analytical technique. Gain is the difference between post-test and pre-test scores. Gain shows students' understanding improvement or conceptual mastery after learning processes. The advantage of development model on critical thinking skills is based on the normalized gain value comparison (N-gain). The normalized gain value (N-gain) may be calculated with the following equation: (Hake, 1999).

$$g = \frac{S_{posttest} - S_{pretest}}{S_{maksimum} - S_{pretest}}$$

**Figure 2.** N-Gain Equation

Where:

S<sub>max</sub> = maximum (ideal) pre-test and post-test score

S<sub>post</sub> = post-test score

S<sub>pre</sub> = pre-test score

The level of the normalized gain value (N-gain) may be classified as follows: (1) if  $g \geq 0.7$ , then the resulted N-gain is categorized as high; (2) if  $0.7 > g \geq 0.3$ , then the resulted N-gain is categorized as moderate; and (3) if  $g < 0.3$ , then the resulted N-gain is categorized as low.

**Table 2.** Paired Statistical Samples

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	VAR00023	21.8636	22	5.42740	1.15713
	VAR00024	25.6364	22	.72673	.15494

Source: Processed Research Data

**RESULTS AND DISCUSSION**

The results of this research consist of two parts. First, results of teaching materials testing effectiveness to improve learning achievement. This learning achievement may be seen from students' condition before and after the treatment using entrepreneurship teaching materials. At this stage, students are given a series of tests consisting of pre-test and post-test later used as the analytical instruments.

The next stage in the second part is conducting effectiveness testing on teaching materials organized using ADDIE model as entrepreneurship teaching materials. The effectiveness model is measured using Gain test to show its Score criteria value determined as follows: (1) if  $g \geq 0.7$ , then the resulted N-gain is categorized as high; (2) if  $0.7 > g \geq 0.3$ , then the resulted N-gain is categorized as moderate; and (3) if  $g < 0.3$ , then the resulted N-gain is categorized as low. Gain score measurement results in average gain score obtained from pre-test and post-test scores which are then confirmed with gain score criteria to draw conclusion.

The research results on the effectiveness of entrepreneurship teaching materials organized using ADDIE model for students of Family Prosperity Education department, Engineering Faculty, Semarang State University, to improve the students' learning achievement may be seen in Table 2.

Table 2 shows students' average scores before (pre-test) and after (post-test) using entrepreneurship teaching materials. Mean value is obtained from the average total scores of those 22 research respondents. The average scores of before and after using entrepreneurship teaching materials are respectively 21.86 and 25.63.

It is found that the average scores of research respondents experienced an increase after treatment using entrepreneurship teaching materials with ADDIE model. The increase of 3.77 (21.86 to 25.63) is a small amount, yet this increase has already shown that the teaching materials have already improved students' learning achievement. To examine further, the relationship between two averages of before and after treatment results, then a correlation test is conducted. The correlation test may be seen in Table 3 below:

**Table 3.** Paired Sample Correlation

		N	Correlation	Sig.
Pair 1	VAR00023 & VAR00024	22	.252	.257

Source: Processed Research Data

The results of paired sample correlation testing show the correlational relationship between average scores of before and after treatment using entrepreneurship teaching materials with ADDIE model. The results of paired correlation show that the correlation between two variables is 0.252 showing that the correlation between the average score before and after treatment is strong and significant.

In the following stage, differential testing is conducted to see the difference between pre-test and post-test results as shown in the output of Table 4.

Differential testing measures the difference between pre-test and post-test scores with a condition if the significance value shows  $< 0.05$  for a significance level of 5%, and/or confirms the results of T statistics with T table. If T statistics  $>$  T table, then it can be said that there is a differen-

**Table 4.** Paired Sample Test

	Mean	Std. Deviation	Std. Error Mean	Paired Differences		t	df	Sig. (2-tailed)	
				Lower	Upper				
Pair 1	VAR00023 VAR00024	-3.77273	5.29089	1.12802	-6.11858	-1.42688	-3.345	21	.003

Source: Processed Research Data

ce between two averages. The average testing of before and after using entrepreneurship teaching materials with ADDIE model has sig. 0.003 with significance value of < 0.05. It shows that there is a significant difference between two averages. In addition, to examine the occurring differences' characteristics whether increasing or decreasing, it can be seen through mean. The mean value is -3.772 which means there is a tendency of increasing scores after treatment (using entrepreneurship teaching materials). The average increase is 3.77.

At the first testing stage, it is found that the use of entrepreneurship teaching materials with ADDIE model may improve students' entrepreneurship learning achievement of Family Prosperity Education study program, Engineering Faculty, Semarang State University. The development of entrepreneurship teaching materials with ADDIE model basically prioritizes development principles based on the existing needs analysis (Muruganatham, 2015). According to Muruganatham (2015) the stages start from Analysis, Design, Development, Implementation, and end with Evaluation.

In analysis stage, the development of entrepreneurship teaching materials is conducted based on need analysis by looking at the gap between learning objectives and students' abilities. Next, the design, the specific and general instructional objectives, analysis on learning participants' characteristics, and the combined relationship will then be conducted. At the development stage, the formulated objectives are developed based on the content of teaching materials and the expected achievements of learning participants. The following stage is implementation of the detailed objectives into learning. At the final stage, evaluation will be conducted on a series of processes.

The use of model to develop teaching materials is considered effective. A research conducted by Ngussa (2014) shows that the use of ADDIE Model in implementing the learning objectives at school may improve the students' higher academic achievements. In addition, Ngussa (2014) also states that the use of ADDIE model in education is highly necessary. Other research conducted by Nawi et al. (2015) explains that ADDIE development model in bridging the objectives designed by the teachers due to the students' needs in to achieve the full services in educational institutions is also highly necessary.

In this research, the entrepreneurship teaching materials are found effective in entrepreneurship learning. The measurement is

conducted using Gain score formula with the analytical results as follows.

**Table 5.** Gain Score

Student Identity	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10	a11	a12	a13	a14	a15	a16	a17	a18	a19	a20	a21	a22	TOT	AVG
pre-test	8	24	20	8	24	18	26	26	19	26	24	27	26	26	19	26	19	25	19	25	20	26	481	21.9
post-test	26	25	23	25	26	25	26	26	25	26	26	26	26	26	26	26	26	25	26	26	26	26	564	25.6

Source: Processed Research Data

From the result above, it shows that the average scores before and after treatment (using entrepreneurship teaching materials) are respectively by 21.9 and 25.6. The effectiveness of entrepreneurship teaching materials for students of Family Prosperity Education department of Engineering Faculty, Semarang State University may be conducted using G score as follows:

$$G = \frac{25.6 - 21.9}{29 - 21.9}$$

$$G = 0.53$$

Based on the results above, G score is obtained by 0.53. Based on the effectiveness criteria of gain score: (1) if  $g \geq 0.7$ , then the resulted N-gain is categorized as high; (2) if  $0.7 > g \geq 0.3$ , then the resulted N-gain is categorized as moderate; and (3) if  $g < 0.3$ , then the resulted N-gain is categorized as low, then the effectiveness of entrepreneurship teaching materials organized with ADDIE model is categorized as moderate (the value of 0.53; if  $0.7 > g \geq 0.3$ , then N-gain is categorized as moderate).

In addition to the students' learning achievement aspect changes, the students' attitudes on entrepreneurship is also considered as an important factor. Students' entrepreneurship interest is considered as one important aspect in entrepreneurship course. The research findings revealed by Farida and Nurhin (2016) explain that entrepreneurship education highly influences the interest of Grade XI students of vocational high school majoring on accounting program. The other research findings revealed by Utami and Widiyanto (2015) show that entrepreneurship learning process significantly and positively influence entrepreneurship interest of Grade XI students of NU Bandar Vocational High School. Based on those findings, it shows that entrepreneurship learning or course may later improve students' entrepreneurship interest.

Due to the research aspects, the students' entrepreneurship interest may be viewed from the researchers' observations. The interest aspect is evaluated based on students' willingness to start business, their courage to take the risks and challenges, to have confidence, creativity, innovation and skills, to face uncertainty, and to create their

own activity plans (Farida & Nurhin, 2016).

Due to the aspect on willingness to start businesses, the researcher findings show students' attitude and interest changes to entrepreneurship after they use the entrepreneurship teaching materials developed with ADDIE model. It is shown from the students' enthusiasm in discussions by asking some questions during the course. In addition, the interviews conducted on respondents show that students of Family Prosperity Education study program of Engineering Faculty of Semarang State University are then interested in entrepreneurship. In line with the research findings revealed by Anggraeni and Harnanik (2016) also explain that entrepreneurial knowledge significantly influences someone's entrepreneurship interest.

## CONCLUSION

The results of this research conclude that the effectiveness of entrepreneurship teaching materials organized using ADDIE model is categorized as moderate, with the value of 0.53. Based on paired sample t-test, it is found that there is a score difference (increasing score) between pretest and posttest, with a small impact level of 25.2%.

The conclusion for this research is that the organized entrepreneurship teaching materials with ADDIE model is considered good to use in entrepreneurship learning process at Family Prosperity Education Department of Engineering Faculty, Semarang State University. The results of data analysis conclude that entrepreneurship teaching materials organized with ADDIE model significantly influence on students' achievement results of Family Prosperity Education of the Engineering Faculty, Semarang State University. In other words, the entrepreneurship teaching materials are greatly effective to use in entrepreneurship learning.

This study suggests that further researches should implement the entrepreneurship teaching materials at the other departments and faculties of Semarang State University, and/or further develop other media or teaching materials equipped with the better supporting software.

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