The influence of scientific thinking and entrepreneurship toward entrepreneurship interest in physics education department students

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Abstract. The Scientific Thinking and Entrepreneurship Course is one of the elective courses that provides entrepreneurial knowledge to students as entrepreneurship provision for students. This study aims to determine the influence of the Scientific Thinking and Entrepreneurship Course’s score with the interest in entrepreneurship in Physics Education students of Teacher Training and Education Faculty, Universitas Syiah Kuala. The research method used is a quantitative method with a descriptive approach and 33 students of Physics Education who had taken the Scientific Thinking and Entrepreneurship Course in the 2016/2017 academic year was chosen as sample by purposive sampling technique. Data collection used is documentation, questionnaires and interviews. Data obtained were analyzed using regression statistics and product moment correlation. Based on the analysis, the results show that the score of the subject of Scientific Thinking and Entrepreneurship Course has little effect on the interest in entrepreneurship, it is evident from the correlation value of 0.02 and classified as a low correlation.

1. Introduction

Presidential Instruction number 14 of 1995 concerning the Movement to Promote and Cultivate Entrepreneurship instructed that entrepreneurship education be carried out at various levels of education. The goal is to be able to grow and develop innovative and creative cultures in the community, especially in the field of education, business circles and government apparatus [1], with this presidential instruction, entrepreneurship education starts at various levels of education including universities. There are several reasons for entrepreneurship education to be important. These reasons include (1) available employment is not enough compared to the number of graduates and (2) graduates who still lack competence. Furthermore, Rismanandi and Yoto [2] said that most college graduates prefer to look for work rather than creating jobs, [1] also another reason for entrepreneurship education needs implemented because entrepreneurial activity in Indonesian is still relatively low compared to other countries.

The low level of entrepreneurial activity in Indonesia was also expressed by Cahyani & Novita that the number of entrepreneurs in Indonesia until the end of 2015 was only 1.65% and was not comparable with the growth of Indonesia's population [3]. In fact ideally the number of entrepreneurs in Indonesia is 2% of the total population, the importance of entrepreneurship education to be carried out is also
reinforced by BPS data on open unemployment collected during the period September 2017 to February 2018 [4].

**Table 1.** The number of open unemployment according to the highest education.

| No. | Completed highest education                  | 2018 February |
|-----|---------------------------------------------|--------------|
| 1.  | No / never attended school                  | 42,039       |
| 2.  | Not yet / not graduated from Elementary School | 446,812     |
| 3.  | Elementary School                           | 967,630      |
| 4.  | Junior High School                          | 1,249,761    |
| 5.  | General High School                         | 1,650,636    |
| 6.  | Vocational High School                      | 1,424,428    |
| 7.  | Academy / Diploma                           | 300,845      |
| 8.  | University                                  | 789,113      |
|     | **Total**                                   | **6,871,264**|

Based on the data above, it can be observed that university graduates who are still unemployed are 789,113 or 11.48% of the total unemployment. The large number of college graduates who have not yet obtained employment shows that graduates still have low competence compared to what is needed in the world of work. This causes the graduates still need training before entering the workforce [5].

The high number of college graduates who have not yet obtained employment is one of the objectives of holding entrepreneurship education in higher education. Entrepreneurship education has also been carried out in the Department of Physics Education at the Faculty of Teacher Training and Education at Syiah Kuala University through the Scientific Thinking and Entrepreneurship Course. This course was first held in the odd semester of the 2016/2017 academic year and was a chosen course. The implementation consists of lecture material provided by lecturers and assignments focused on skills in producing products that have scientific and entrepreneurial values.

The Scientific Thinking and Entrepreneurship Course sharpens students' thinking in order to understand entrepreneurship well, both in terms of theory and practice. Its implementation does not only focus on the material, but also on the task of making entrepreneurial products. Through the task of making this entrepreneurial product, students are taught to be able to observe the advantages and disadvantages of existing products and then innovate them into new products that are more useful and worth selling. This course students expected to be able to become entrepreneurs and can create added value for a product so that it benefits the people [4].

The purpose of applying the Scientific and Entrepreneurial Thinking Course will realize if the material is taught full of knowledge so that knowledge can produce good entrepreneurial mastery that reflected in the form of values or numbers and attitude changes [6]. Changes in attitudes experienced by students can observe from the formation of the characteristics of an entrepreneur such as creative, independent, hard work, discipline, high commitment, realistic, honest and innovative [7]. This characteristic is very helpful for someone who wants to be an entrepreneur in changing their mindset and developing themselves.

Entrepreneurial characters can grow if someone always in an entrepreneurial environment. According to Frinces [8] there are four ways that a person can be in the entrepreneurial world through education and training, practical work, lineage and structured training so that someone can continue to develop their potential in entrepreneurship. Meanwhile, in the world of education there are several efforts that can be made to cultivate entrepreneurship, including familiarizing entrepreneurship education within and outside the classroom, designing entrepreneurial curriculum and familiarizing the
culture of entrepreneurship [5], these ways can foster a culture of entrepreneurship in the world of education so as to produce independent and creative students.

Entrepreneurship education who followed can influence the growth of interest in entrepreneurship so it can implement the knowledge gained, the interest in entrepreneurship is the tendency / interest in entrepreneurship, feelings of pleasure, desire and encouragement for entrepreneurship [2]. There are several factors that influence the interest in entrepreneurship in a person. According to Bygrave in Alma (cite in [9]), these factors include, personality aspects (personal), family relationships (sociological) and relations with the environment (enviromental). However, this entrepreneurial interest cannot grow if one has not yet realized the benefits of entrepreneurship. Therefore, as entrepreneur need an attitude mindset and willingness to be entrepreneurial, so that entrepreneurial activities can develop and expected to have an impact on economic development [4].

The interest in entrepreneurship in a person can arise from the knowledge and experience gained during taking courses in scientific thinking and entrepreneurship. Furthermore, in entrepreneurship learned without someone having to come from an entrepreneurial descent. This illustrates that interest in entrepreneurship generated through entrepreneurship education that was followed. A similar thing was expressed by Atmaja & Margunani, that entrepreneurship education was able to influence the interest in entrepreneurship in Malang State University students by 14.95% [10]. However, the research was conducted by Nurikasari [11], actually obtained the results that there was no positive influence between entrepreneurship education and the interest in entrepreneurship in Economic Education students of Kanjuruhan University Malang.

The difference in the results of this study make researchers interested in conducting similar research in the Department of Physics Education with the aim to determine the effect of Scientific Thinking and Entrepreneurship Course's score with the interest in entrepreneurship of Physics Education students in Teacher Training and Education Faculty, Syiah Kuala University.

2. Research methods
The research method used is a quantitative method with a descriptive approach and 33 students of Physics Education, Teacher Training and Education Faculty, Syiah Kuala University as research subject who had taken the Scientific Thinking and Entrepreneurship Course in the 2016/2017 academic year. The sampling technique used saturated samples or census techniques, meaning that all members of the population used as research samples. Data collection used documentation, questionnaires and interviews. The documentation used is in the form of the value of students who have taken courses in Scientific Thinking and Entrepreneurship Course, while the questionnaire is arranged based on a predefined grid. The data obtained are then processed using regression tests and product moment correlations then interviews conducted to complete the data obtained from the questionnaire.

3. Results and discussion
The research shows that the score of the Scientific Thinking and Entrepreneurship Course does not have a positive effect on the interest in entrepreneurship in Physics Education students of Teaching and Education Faculty, Syiah Kuala University. The table below shows the relationship between the score of Scientific Thinking and Entrepreneurship Course with the interest in entrepreneurship in Physics Education students of Teaching and Education Faculty, Syiah Kuala University.
Table 2. Data on the score of science and entrepreneurship thinking courses and questionnaire values

| No | Name | Subject score | Average questionnaire value |
|----|------|---------------|-----------------------------|
| 1. | R1   | 3.5           | 3.18                        |
| 2. | R2   | 3             | 3.16                        |
| 3. | R3   | 4             | 3.1                         |
| 4. | R4   | 4             | 3.08                        |
| 5. | R5   | 3             | 3.08                        |
| 6. | R6   | 4             | 3.22                        |
| 7. | R7   | 3             | 2.35                        |
| 8. | R8   | 4             | 2.54                        |
| 9. | R9   | 3             | 2.79                        |
| 10.| R10  | 3.5           | 2.72                        |
| 11.| R11  | 3             | 3.39                        |
| 12.| R12  | 3             | 3.04                        |
| 13.| R13  | 3.5           | 3                           |
| 14.| R14  | 3             | 2.91                        |
| 15.| R15  | 3             | 3.56                        |
| 16.| R16  | 3.5           | 3.33                        |
| 17.| R17  | 3.5           | 2.95                        |
| 18.| R18  | 4             | 3.04                        |
| 19.| R19  | 3             | 2.7                         |
| 20.| R20  | 4             | 3.47                        |
| 21.| R21  | 4             | 3.06                        |
| 22.| R22  | 3.5           | 3.16                        |
| 23.| R23  | 4             | 3.62                        |
| 24.| R24  | 3.5           | 3.14                        |
| 25.| R25  | 4             | 3                           |
| 26.| R26  | 3.5           | 3.39                        |
| 27.| R27  | 3.5           | 2.97                        |
| 28.| R28  | 3.5           | 3.31                        |
| 29.| R29  | 3.5           | 3.54                        |
| 30.| R30  | 3             | 3.22                        |
| 31.| R31  | 4             | 4                           |
| 32.| R32  | 4             | 3.93                        |
| 33.| R33  | 3             | 3.22                        |

The data obtained from table 2 and displayed in graph 1 form the relationship between the score of Scientific Thinking and Entrepreneurship Course with an interest in entrepreneurship in Physics Education students of Teaching and Education Faculty, Syiah Kuala University. Through this graph, it observed that insignificant effects are formed from the slope of the graph.
Graph 1. The relationship between the score of science thinking and entrepreneurship courses with interest in entrepreneurship.

Based on the graph above, it observed that every increase in the score of the Scientific Thinking and Entrepreneurship Course is not always followed by an increase in interest in entrepreneurship obtained from the questionnaire score. This can be seen from the regression equation $Y = 2.31 + 0.02X$, that is, every increase in variable X (the score of the subject of science and entrepreneurship) is only followed by an increase in the variable Y (interest in entrepreneurship) of 0.02 only. This graph shows that the score of science and entrepreneurship thinking courses only has a very low influence on the interest of student entrepreneurship.

This low influence caused by several factors, one of them being students who take the Scientific Thinking and Entrepreneurship Course. Based on the interviews conducted, some research respondents did have the intention to become entrepreneurs, but it was not clear what kind of business they wanted to realize. In general, respondents are also less interested in entrepreneurship with products that have scientific value in them. The reason is that the product produced, is difficult to assemble, the process takes a long time, raw materials are difficult to find and the price of raw materials is quite expensive. Because of these matters, respondents preferred entrepreneurship in other fields such as online shops, food, clothing and opening stalls even though they did not yet have careful planning for entrepreneurship in the desired field.

The subject of Scientific Thinking and Entrepreneurship Course does not fully contribute to the interest in entrepreneurship of Physics Education students in Teaching and Education Faculty, Syiah Kuala University. This can be seen from the recognition of several research respondents who said they had started small businesses such as selling pulses, electricity tokens, food and clothing. However, because it did not run smoothly and could not share time with college, the business was finally stopped. After that, the respondent has not started the business again.

In addition to educational factors, personality, environmental, and family factors also influence the growing interest in entrepreneurship. There are three factors that also influence the interest in entrepreneurship in a person, including personal factors (one's personality), sociological (relationships with family) and environmental (relations with the environment) [9]. The level of education is not fully influential in fostering interest in entrepreneurship, but depends on the personality of students in accepting entrepreneurship education that followed [11].

Based on the two opinions above, it concluded that the interest in entrepreneurship in students cannot grow only by taking courses in science and entrepreneurship thinking. However, it must follow by
family support, environment, personality and various other efforts that can help students foster an interest in entrepreneurship and develop their abilities. This positive and accepting entrepreneurial personality has been held by Physics Education students in Teaching and Education Faculty of Syiah Kuala University who have taken courses in Science and Entrepreneurship Thinking. This obtained from interviews that show students have realized entrepreneurship can increase income, can foster independence, benefit others, and expand social relations.

Another factor is following various activities that lead to entrepreneurial activities. There are three ways to foster interest in entrepreneurship, namely (1) formal education and training, (2) working in business organizations, (3) being within the organization or community where business activities or creativity occur [8].

Based on the results, it concluded that the score of the Scientific Thinking and Entrepreneurship Course only provides a small/weak influence towards the interest of student entrepreneurship, there are several efforts that can be done to increase the interest of student entrepreneurship through entrepreneurship education.

According to Hasan [5], these efforts include:
1. Strengthen entrepreneurship education curriculum
2. Designing a curriculum that is able to foster understanding, character and entrepreneurial skills
3. Familiarize the culture of entrepreneurship in the educational environment.

Through the above efforts, it expected that students’ interest in entrepreneurship can grow and develop so that students can apply the knowledge and experience gained while participating in the Scientific Thinking and Entrepreneurship Course in Teaching and Education Faculty of Syiah Kuala University.

4. Conclusions
The conclusion of this study is that the Scientific Thinking and Entrepreneurship Course’s score does not have a significant positive effect on the interest in entrepreneurship.

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