

WHICH IS THE MOST APPROPRIATE LEARNING MODEL TO IMPROVE STUDENTS' ENTREPRENEURIAL INTEREST? A COMPARISON OF TWO KINDS OF ACTION RESEARCH

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Abstract

Purpose of the study: This study introduced a new learning model called GEPPRAK (*Grup: Group, Eksplorasi: Exploration, Pengembangan Ide: Idea Development, Penyusunan dan Presentasi Rencana Usaha: Preparation and Presentation of the Business Plan, Aksi dan Kompetisi: Action and Competition*) and compared higher education students' interest change in entrepreneurship through the application of the GEPPRAK learning model and the Problem Based Learning (PBL) learning model.

Methodology: This research was quantitative research with an experimental research design. The design in this study was the true experimental design using pre-test and post-test control group design. Data collection used documentation, observation, and questionnaire. Data analysis techniques in this study used an independent sample t-test using IBM SPSS 22.

Main Findings: The results showed that entrepreneurship learning using the GEPPRAK learning model proved to be able to improve entrepreneurial interest better than the Problem Based Learning (PBL) model in the experimental class in this study.

Applications of this study: The results of this study can be used by teachers and lecturers as a reference for the selection of entrepreneurship learning models in schools and universities.

Novelty/Originality of this study: The GEPPRAK learning model is a new learning model developed in Indonesia so that it still needs to be tested for its effectiveness in improving students' entrepreneurial interest.

Keywords: Entrepreneurial Interest, Entrepreneurship, GEPPRAK, Learning Model, Problem Based Learning.

INTRODUCTION

Entrepreneurship is a regional factor, attributes, resources, and actors that support the creation and expansion of innovative new businesses and high-growth (Spigel (2019)). Entrepreneurship is a weapon to enhance economic growth in Indonesia because one of the characteristics of domestic economic activity in Indonesia is the dominance of Micro, Small and Medium Enterprises (MSMEs) (Tambunan, 2019). The potential of Indonesian entrepreneurs has continued to grow in the last ten decades, as evidenced by the increasing trend of the number of MSMEs in Indonesia from 1997 to 2017 in all sectors that can be observed in Figure 1 following.

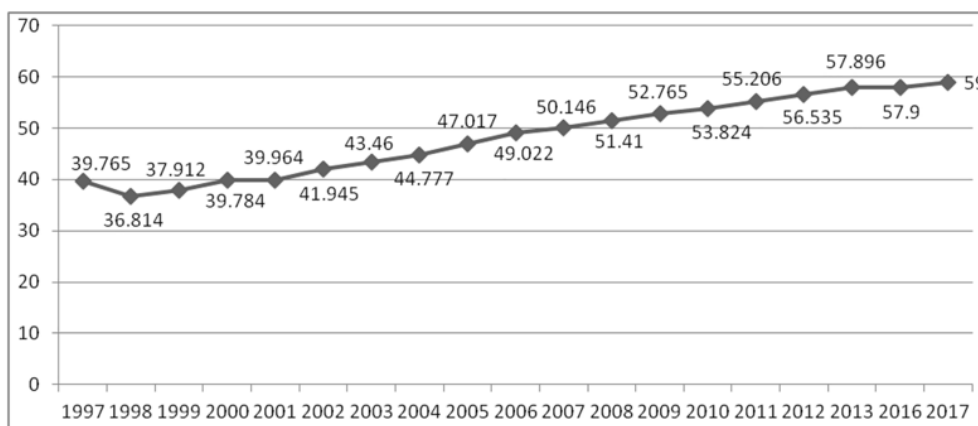


Figure 1: A total number of Indonesia MSMEs in all sectors from 1997 to 2017 (million units).

Source: [Tambunan \(2019\)](#)

In mid-2016, the Government of Indonesia through the Ministry of Communication and Information Technology (Kemenkominfo) launched the National Movement of 1,000 Digital Pilot Businesses. This program is considered realistic because the number of internet users in Indonesia has reached 107.2 million, up from 84 million users in 2016 (statista.com, 2019). This program is increasing the number of startups in Indonesia.

However, with the increasing number of MSMEs, it turns out that the problem of unemployment in Indonesia is still not unravelled. The unemployment rate is still high from year to year. Job seekers who have an undergraduate level of education are more interested in becoming civil servants than creating their own business or investing in other people's businesses (Syam, Akib, Yunus & Hasbiah, 2018; Naafs, 2017). On the other hand, there are not as many vacancies to become civil servants as university graduates. This has resulted in high unemployment rates for tertiary education graduates in Indonesia. Data of Central Bureau of Statistics (2019) showed that in the last three years, unemployment with Diploma I / II / III education increased by 0.5% and unemployment with Bachelor education increased by 1.2%. This fact is inversely proportional to the unemployment rate of elementary, junior high, high school and vocational high school graduates who decrease with varying percentages.

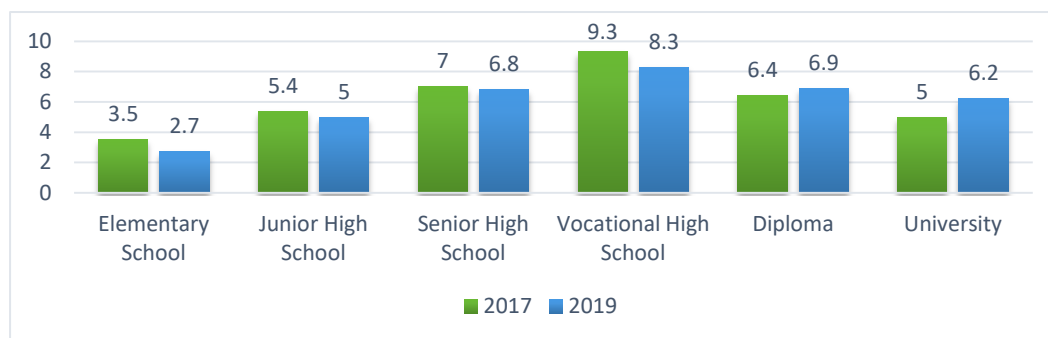


Figure 2: Unemployment Rates based on the Education Level

To improve the mind-set of college graduates, effective entrepreneurship education design is needed to improve students' entrepreneurial interests. This effort can be done by developing knowledge and training student skills in the learning process and providing stimulus and entrepreneurial direct practice. Demanding students to make a superior product and then be marketed to campus residents, families and the public is a must. Entrepreneurship education not only encourages students to start their businesses but also makes them more creative and innovative (Schmitz et al., 2016). Besides, the effort that can be made in the learning process is by creating an effective learning atmosphere. The way to do this is by choosing media or learning models that can stimulate students' enthusiasm for entrepreneurship.

Quite several studies have been conducted on the effect of entrepreneurship education on entrepreneurial intentions (Barba-Sánchez & Atienza-Sahuquillo, 2017) and entrepreneurial motivation (Oosterbeek et al., 2010). Amalia & Laily (2015) found a significant relationship between students' perceptions of entrepreneurial teaching methods and the level of student entrepreneurial interest. Research by Nowinski, W., Haddoud, MY, Lancaric, D., Egerova, D., & Czegledi, C. (2019) found that of the 4 Visegrád countries (Czech Republic, Hungary, Poland and Slovakia), the direct effect of entrepreneurship education on positive and significant interest in entrepreneurship was only found in Poland where entrepreneurship education has introduced since secondary school level. Based on these studies, there are inconsistencies in the results regarding the effect of entrepreneurship education on entrepreneurial interest. There were findings in three countries that entrepreneurship education did not contribute to entrepreneurial interest. In this case, the selection of learning models has an important role in the magnitude of the effect of entrepreneurship education on entrepreneurial interest (Periansya, 2018).

Ho, Uy, Kang, & Chan (2018) found that from an online survey of 328 students from five high schools it was found that those who attended entrepreneurship training had a much higher sensitivity and confidence in entrepreneurship compared to those who did not undergo training. Sukavejworakit, Promsiri & Virasa (2018) found that the opportunity evaluation through experiential learning (OETEL) model was proven to be able to affect student interest to become entrepreneurs. Both of these studies tend to suggest active and student-centred learning to get the effect of strong entrepreneurship education that affects student entrepreneurial intentions. However, an interesting finding was obtained from Ismail, Sawang & Zolin (2018), that student-centred or teacher-centred learning both had a positive effect on student entrepreneurial interest. However, students who learn to use the teacher-centred approach statistically develop higher in terms of objective and subjective learning outcomes compared to students who learn to use a student-centred approach. It is also suggested that the relationship between entrepreneurship education and entrepreneurial intentions was mediated by the skills learned.

The various results of the study lead to an impetus to compare the two learning models with the student-centred approach which has the aim of learning to form the same skills in entrepreneurship classes in tertiary institutions. The student-centred learning model is designed to develop the potential of students to foster student interest in entrepreneurship. There are many models in student-centred learning, including the GEPPRAK learning model and Problem Based Learning (PBL).

The "GEPPRAK" Learning Model is abbreviated form *Grup* (Group), *Eksplorasi* (Exploration), *Pengembangan Ide* (Idea Development), *Penyusunan dan Presentasi Rencana Usaha* (Preparation and Presentation of the Business Plan), *Aksi dan Kompetisi* (Action and Competition). The GEPPRAK learning model is a learning model introduced by

[Murtini, Sujadi, and Noviani \(2016\)](#) as an effort to develop a learning model that integrates character values in it. The GEPPRAK learning model encourages students to foster entrepreneurial interest with direct experience in the field so that students can know and participate in entrepreneurial activities and can sharpen Soft Skills and Transferable Skills. The advantage of this model is that GEPPRAK invites students to be able to directly participate in activities in the field, plan, make products and market products to consumers so that they not only learn about the theory but directly participate in entrepreneurial activities.

While the Problem Based Learning (PBL) model is an active learning method centred on students who develop critical thinking ability through problem-solving ([Loyens et al., 2015](#)). This is based on a small group collaborative investigation of practical case scenarios guided by instructors to stimulate problem-solving skills which can be transferred between disciplines ([Klegeris and Hurren, 2011](#)). This model is oriented to problems and how to solve those problems. In the context of entrepreneurship, this method requires students to determine one business unit object to be studied. Students study the problems faced by the business unit, analyze them based on theory, determine the strategy and then implement the solution. The final step in this model is the evaluation and reflection on the effectiveness of the solutions that have been initiated to overcome the problems of the business unit.

In the entrepreneurship class, both of these learning models focus on student participation in solving problems faced when running a business directly. The difference is that in the GEPPRAK learning model students are required to create their products to be marketed, while in the PBL model, students look for business units that are already running. Both of these learning models have been examined concerning their success in improving students' entrepreneurial interests. [Murtini \(2016\)](#) claimed that the use of the GEPPRAK learning model gave an indication of growing students' interest in entrepreneurship while the PBL model was found to be able to improve various skills so that it had a positive effect on students' entrepreneurial interest in the research of [D'Souza, Clarkin & Al-Bahrani \(2018\)](#); [Surjanti, Nugrohoseno, Budiono&Muafi \(2018\)](#) and [Kunicina, et al \(2019\)](#). In this study, the GEPPRAK learning model will be compared to its effectiveness with the PBL model which in fact is well-established and widely used in learning in terms of the ability to improve student's entrepreneurial interest.

METHODOLOGY

This research was quantitative research with experimental research design. This study used true experiments because in this design the researcher could control all external variables that affected the course of the experiment. The purpose of true experiments according to [Suryabrata \(2011\)](#) is to investigate the possibility of a causal relationship by giving treatment and comparing the results with a control group that is not given treatment. This research was conducted in the Entrepreneurship class. The provision of treatment and feedback was done repeatedly four times within 60 days. The design used in this study was a true experimental design. This true experimental design used pre-test – post-test control group design. The two groups chosen randomly in this design, namely the experimental group and the control group, and then given a pre-test to find out the initial conditions of group students.

Table 1: Research Design

| | | <i>Pre-test</i> | <i>Treatment</i> | <i>Post-test</i> |
|--------------------|---|-----------------|------------------|------------------|
| Experimental Group | R | (O1) | X | (O2) |
| Control Group | R | (O3) | X | (O4) |

Data collection in this study used an instrument in the form of a self-developed questionnaire based on relevant theory. There were two groups to be observed, namely the experimental group and the control group from two entrepreneurship classes at the Faculty of Economics, Universitas Negeri Semarang, Indonesia. The experimental class was given treatment in the form of the GEPPRAK learning model while the control class was given treatment in the form of the PBL model ([Al Anshori, Rokhmat&Gunada, 2019](#)). Both treatments were carried out for 60 days.

The same questionnaire was distributed twice before pre-test and after the post-test. This questionnaire measured the student's entrepreneurial interest in several indicators, namely: having confidence, dare to take risks, creative and innovative, discipline and hard work, future-oriented, and having curiosity. Pre-test and post-test data were then tested by using the Independent Sample T-Test to measure differences in the variables before and after treatment.

RESULTS/FINDINGS

This study was conducted to determine changes in students' entrepreneurial interest in entrepreneurship learning that were treated by using the GEPPRAK learning model and Problem Based Learning (PBL). This research was conducted on students who participated in entrepreneurship learning by using two research groups namely the experimental and control groups. Researchers used the experimental group as a group that was given treatment by using the GEPPRAK learning model and the control group by using the Problem Based Learning (PBL) model. Before the research was conducted, the pre-test was given to the experimental class and the control class. This was intended to determine the initial state of students' entrepreneurial interest before conducting research.

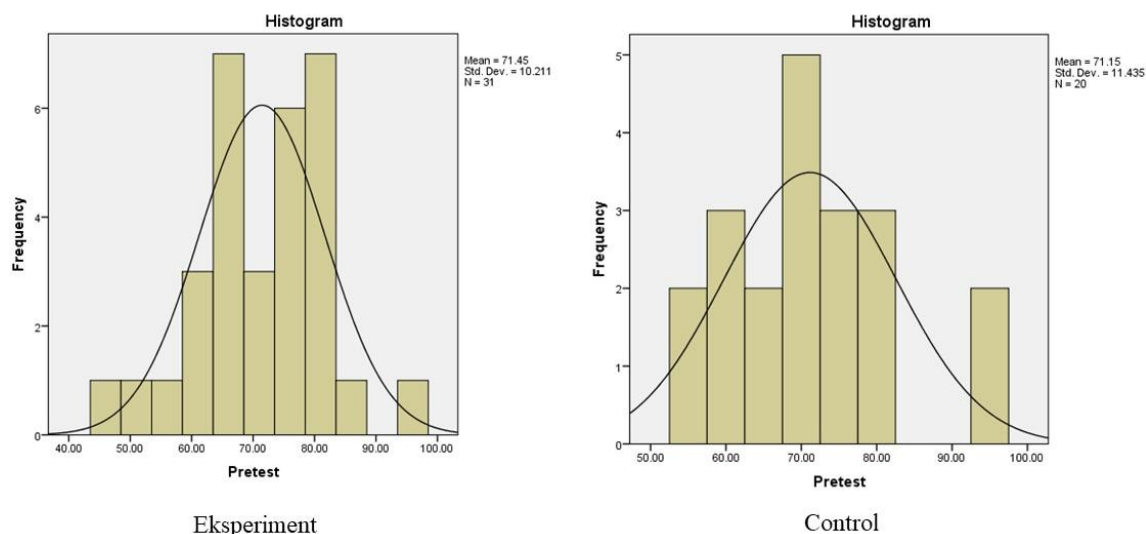


Figure 3: Pre-test results of the experimental and control classes

Based on the descriptive analysis, several findings were related to the research objectives. The results of the pre-test calculation shown in Figure 3, that the average pre-test results of the experimental group were 71.45 while the average pre-test of the control group was 71.15. This showed the average value of the pre-test experimental group was greater than the average value of the control group. Furthermore, to prove the existence of a significant difference between students' entrepreneurial interest in the experimental class and the control class, a t-test was performed and the significance value of the difference test was obtained by Sig (2-tailed) $0.678 > \alpha (= 0.05)$ and the value of t-count ($0.098 < t$ table (1980)), so that the test decision was there was no difference in the average value of pre-test students in the experimental group and the control group. The following table shows the calculation of the pre-test results of the experimental group and the control group.

Table 2: Pre-test results of Independent Samples Test for the experimental and control groups

| Independent Samples Test | | | | | | | |
|--------------------------|-----------------------------|---|------|------------------------------|--------|-----------------|---------------------------------------|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | |
| | | F | Sig. | T | df | Sig. (2-tailed) | Mean Difference Std. Error Difference |
| Value | Equal variances assumed | .174 | .678 | .098 | 49 | .922 | .30161 3.06944 |
| | Equal variances not assumed | | | .096 | 37.320 | .924 | .30161 3.14665 |

Source: Data Processed 2019

After the pre-test was carried out, further research was carried out in the experimental and control groups. The experimental group was given treatment by using the GEPPRAK learning model and the control class was given treatment by using the Problem Based Learning (PBL) model. Each class was given a post-test in the form of a questionnaire of entrepreneurial interest to find out the effect after learning from the two groups. Here are the results of calculations after learning and given a posttest.

Table 3: Test of Mean difference for the experimental and control groups

| Group Statistics | | | | |
|------------------|----|---------|----------------|-----------------|
| Group | N | Mean | Std. Deviation | Std. Error Mean |
| Experiment | 31 | 79.2903 | 7.90862 | 1.42043 |
| Control | 20 | 71.9500 | 10.09155 | 2.25654 |

Based on Table 2. the results of the post-test calculation in both classes showed the mean of the experimental class post-test was 79.29 and the mean of the control class was 71.95. This showed that the experiment class was higher than the control class. The difference was affected by the learning model used in each group. Furthermore, to prove whether there was a significant difference or not, a test using the t-test is presented in the following table.

Table 4: Post-test results of Independent Samples Test for the experimental and control groups

| Independent Samples Test | | | | | | | | |
|--------------------------|-----------------------------|---|------|------------------------------|--------|-----------------|-----------------|-----------------------|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | |
| | | F | Sig. | T | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference |
| Value | Equal variances assumed | .908 | .345 | 2.902 | 49 | .006 | 7.34032 | 2.52947 |
| | Equal variances not assumed | | | 2.753 | 33.690 | .009 | 7.34032 | 2.66638 |

Source: Data Processed 2019

Based on Table 2, it can be seen the results of testing to determine differences in groups after being given treatment by using the GEPPRAK learning model in the experimental group and PBL in the control class. Significance of the post-test mean difference test was obtained by Sig (2-tailed) $0.006 < \alpha (= 0.05)$ and t-count $(2.902) > t\text{-table} (1,980)$ so that the H_0 test decision was rejected. It means that there was a mean difference in the post-test in the experimental group and control group. The mean difference in the post-test explained that treatment in the experimental group improved students' entrepreneurial interest very significantly. Thus the use of the GEPPRAK learning model in entrepreneurial learning was more effective in improving students' entrepreneurial interest compared to the PBL learning model.

The results showed a significant difference between the experimental group and the control group on students' entrepreneurial interests. This difference was affected by the application of the learning model as a treatment carried out in the entrepreneurial learning process. The results of the study showed a significant difference in the entrepreneurial interest of the experimental group students who used the GEPPRAK learning model was higher than the control group that used the PBL model. This showed that the use of the GEPPRAK learning model could improve students' entrepreneurial interest in entrepreneurial learning. The results of this study were consistent with research conducted by [Murtini\(2016\)](#) that the enthusiasm of students was high, indicated by activities in five stages, entrepreneurial projects starting from (1) small groups, (2) exploration, (3) business idea development, (4) Preparation and presentation of business plans, (5) Action and business competition, ran smoothly and successfully internalizing 3 (three) character values and 5 (five) soft skills-transferable skills with a high score of 68% and a middle score of 32%. All products were sold out and some products received orders, this showed an indication of growing entrepreneurial interest.

A research conducted by [Olokundun, et al \(2018\)](#), stated that teaching entrepreneurship based on experience was able to provide active participation in developing business potential and competitive business interests. This study deals with learning models that are based on student experience and participation in developing students' entrepreneurial interest potential. In addition, research conducted by [Mulyani \(2014\)](#) showed a hypothetical model of learning based on an entrepreneurship education project that was effective in improving entrepreneurial attitudes, entrepreneurial interests, and learning achievement.

The GEPPRAK learning model is one of the cooperative learning models in which there are learning activities in the form of projects, from building groups, developing ideas, composing business to compete in the business world. The learning process using the GEPPRAK learning model in the experimental group is as follows.

1. Stage of Small Group Building

This research was conducted by involving 31 experimental group students who were divided into five groups. Each group consisted of 5-6 students who were divided based on the heterogeneity of student characteristics. The division of groups was done to train students to respect one another and help one another in groups. The ability to work together was very important, as the survey of the National Association of Colleges and Employers in 2011 found that the top quality that employers seek in prospective employees (outside of major-specific knowledge) is the ability to work on a team ([Schreiber & Valle, 2013](#)).

The lecturer's goal is to create groups that are highly diversified and groups whose members don't already know each other ([Schreiber & Valle, 2013](#)). Heterogeneous groups are very appropriate in teaching the values of togetherness to children regardless of the student's background. This is in line with what was delivered by lecturers who are in charge of entrepreneurship courses who said,

"Before giving my material, I instructed students to form groups first, I made groups of 5 randomly and heterogeneously with the purpose that they would be able to work together and respect each other"

The formation of groups provides opportunities for students to participate in discussion activities so that the material and assignments given can be implemented properly. Furthermore, entrepreneurship students also responded,

"Group formation was as a trigger to be active, express ideas and participated in solving problems together with my group, we exchanged ideas, sir"

Besides, the stage of small group building also has character values formed including soft skills and transferable skills. Character values are formed through group discussion, namely, the ability of students to give an opinion and ask questions (driving questions and need to know), respect the opinions of others, respect the rules that have been set, solve a problem and find alternative solutions (voice and choice), then revise and reflect (revision and reflection) The group activities will form a brave attitude, sportive, caring, problem-solving, counseling skills, administrative skills and change skills. Thus, the formation of groups can give students the ability to think more and develop teamwork in problem-solving and have skills through group discussions.

2. Stage of Exploration

This exploration stage is a strengthening of material related to entrepreneurship theory and entrepreneurial strategies. Lecturers motivated in the form of successful entrepreneurial success stories. The students listened and watched closely the struggle of the entrepreneur from the beginning of starting a business until finally achieving success.

Research by [Jansen, van de Zande, Brinkkemper, Stam & Varma \(2015\)](#) found that there are three stages of the Student Entrepreneurship Encouragement Model, namely: educate, stimulate and incubate. The stimulus in the exploration stage of the GEPPRAK method includes the second stage, namely stimulate. The purpose of this stage is to support students' business ideas by transforming from an idea towards a complete business plan.

At this stage, the lecturer asked students in groups to make field observations to the place of successful entrepreneurs around the campus environment under the business ideas they would develop. Students made observations and interviews with entrepreneurs to gain experience, hands-on knowledge, and development of business ideas and planned business implementation processes.

The story of hard work and never despair obtained directly from the entrepreneur will increase student enthusiasm. The ability of problem-solving to overcome every failure that has been experienced, the characteristics that need to be owned and tips for success in building entrepreneurship are things that need to be considered and applied by each group of students in the business plan that they will compile. There was a student response that stated

"Being an entrepreneur requires process and sincerity if you want to develop so that perseverance and discipline are needed".

Followed by another student who stated

"Being an entrepreneur must be strong in going through the process and ready to bear the risk so it needs careful planning."

3. Stage of Business Idea Development

The development of business ideas is carried out after conducting field observations to successful entrepreneurs and holding group discussions. In the experimental class in this study, each group came up with an idea to make a product that is under the millennial spirit. The first group, "Laundry Shoes" (service business activities of shoe washing); second group, "Pizza Vegetariez" (pizza that uses healthy and delicious vegetables); third group "Healthy Salad" (healthy fruits seasoned with mayonnaise, yoghurt, milk); fourth group "flower soap" (flowers made from soap so that it emits a fragrant aroma and has beauty); fifth group "kriuk mushroom" (tasty and delicious crispy mushroom).

The results of [Heinonen, Hytti & Stenholm \(2011\)](#) research showed that creativity is not directly related to the feasibility of business ideas. However, creativity can strengthen opportunity search and identification strategies based on acquired knowledge. Thus, the effect of creativity on the feasibility of a business idea is fully mediated by a creative opportunity-seeking strategy based on the acquisition of knowledge.

4. Stage of Preparation and Presentation of Business Plan

After conducting interviews and making business idea plans, students made the results of group discussions into a presentation slide and then presented it at the next meeting. Each group presented alternately and provided information obtained in the interview with business actors. It aims to strengthen the results of observations and the development of business ideas that have been made. Other lecturers and group students criticized each other and gave suggestions on their business idea plans.

Academically, business plans are seen as risk management instruments where internal and external merits could be derived ([Barringer, 2009](#)). From an external perspective, potential investors are given a general picture of entrepreneurial opportunities and plan to exploit them. While the internal perspective, entrepreneurs have developed a road map to follow. When these two perspectives are combined, common sense logic arises why each entrepreneur will write a

business plan before engaging in the process of starting a new business. One of the challenges found in this process is the need to remove overconfidence ([Kaufman, 2012](#)) from business plans of inexperienced students when creating initial business ideas that can be creative but are not relevant to market conditions.

At this stage, the lecturer gave direction in making business planning proposals and guided students to complete them. Some findings indicated that there were groups that did not include cost components such as capital and the production process. The problem was that students did not know to take into account financial planning in the business to be developed. So the lecturer gave direction to students to improve the proposal. After being corrected, students presented their business idea plans and business plans. The enthusiasm and enthusiasm of the students illustrated that they had a strong interest and motivation to learn to become an entrepreneur.

5. Stage of Action and Competition

After the planning and preparation of the proposal was complete and all proposals were received, the highlight of this activity was business competition. There were 5 proposals for food processing business ideas, namely Laundry Shoes, Pizza Vegetariez, Healthy Salads, Flower Soap and Kriukk Mushroom. Each group received an initial capital of Rp 100,000.00 which was collected from each group. The capital was expected to be utilized as much as possible by the group to be able to produce products and use them in a competition that is selling products to consumers.

The production process was carried out by students in each group. The production was done at home or in the boarding house. Students then marketed their products online, such as Instagram, WhatsApp, Facebook and so on. Each group was very enthusiastic to promote their products, and hope consumers were interested in the products. Almost all food products by each group were sold out, but there were also groups whose products were still left. After the competition was over, and the winner was chosen, the "healthy salad" group that has the most sales and highest profits among the other groups. The "healthy salad" product was popular because, in addition to being a trend among students, the quality of fruits and vegetables that were raw materials was very good so that the interest in the product was very high.

Based on the results of applying the GEPPRAK model, each group said they were very happy with the competition even though they did not win. Some group representatives said they were very happy with the GEPPRAK learning model. This was because they could directly participate in finding information to the speakers, and then learn to make good and right business proposals, then they would be implemented and finally, they would compete to market the products. The GEPPRAK learning model is expected to shape students' good behaviour as a form of embedded student entrepreneurial interest so that they can become a true entrepreneur. Besides, it can be a student stock after graduating from college to have a mind-set as a job creator, not a job seeker. In this regard, [Kassean, Vanevenhoven, Liguori, and Winkel \(2015\)](#) in their research findings stated that entrepreneurship education must focus on real-world experiences, actions, and reflective processes to introduce students to authentic learning, which should lead to more entrepreneurial abilities and tendencies, and ultimately to improve entrepreneurial performance, which will be beneficial to individuals and society.

Unlike the control group that used the PBL model. The difference was seen in students' enthusiasm in the learning process due to the absence of field practice. So students were limited to planning their business properly and correctly without the cost of action. Learning planning was only limited to solving problems in entrepreneurship and making entrepreneurial planning and providing solutions to problems that occur in the field of entrepreneurship. As stated by [Chen, Lin & Cang \(2011\)](#) PBL refers to a learning approach that focuses on the problem-solving process whereby students obtain the necessary knowledge. Furthermore, [Person & Bignell \(2011\)](#) said that PBL takes place in the context of structured tasks aligned with real-world programs or scenarios related to the subject matter. Thus a significant difference is the treatment of the syntax of learning models that affect the increasing interest in student entrepreneurship. Significant improvement was seen in the experimental group using the GEPPRAK learning model. So this learning model is very effective to increase students' entrepreneurial interests and shape the character or spirit of the student to become an entrepreneur.

CONCLUSION

Based on the results of the analysis and discussion of the results of the study, it can be concluded that entrepreneurial learning conducted by using the GEPPRAK learning model to measure students' entrepreneurial interest in the experimental group was superior to the control group using the PBL model. This is most likely due to the level of complexity of the stages owned by GEPPRAK that is more comprehensive than PBL so that it can construct the entrepreneurial mindset more deeply than the PBL model. The ability to solve problems is important for every entrepreneur to have, but the ability to execute new ideas from the experience of solving other people's problems is the key for an entrepreneur to be able to maintain and develop his business in this era of information technology sophistication.

LIMITATION AND STUDY FORWARD

The data in this study were collected only from two classes in one faculty of a university, which means it has a quite low ability in generalizing. The future study is suggested to conduct the same experiment across universities in a country or

to create a cross-culture experiment in some countries to make a better conclusion about the effectivity of the GEPPRAK learning model.

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AUTHORS CONTRIBUTION

The first author is contributed to set the research problem, to elaborate the discussion, to improve the manuscript based on reviewers' suggestion and simply to handle the correspondence with the journal. The second author's contributions are including doing the class experiments, collecting the data, analyzing the data and making a conclusion.

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