

Needs Analysis of Entrepreneurships Pedagogy of Technology and Vocational Education with Production Base Learning Approach in Higher Education

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Abstract — This research is aimed to analyze entrepreneurship pedagogy needs of Technology and Vocational Education in higher education. This needs analysis explored deeply the importance of entrepreneurship pedagogy of Technology and Vocational Education including curriculum aspects, instructional materials, pedagogy, and instructional materials needs. The type of the research is descriptive with survey methods. Technique of data collection was spreading questionnaire and interview. The sample is students of Technology and Vocational Education, lecturer of entrepreneurship course, and entrepreneurs. Technique of data analysis used in this research was quantitative and qualitative. Based on the result of needs analysis which is done quantitatively and qualitatively, it can be concluded that (1) there are needs disparity between students and entrepreneurship lecturer, especially in the aspect of learning models (methods, approaches, materials, modules and other instructional materials used), and (2) entrepreneurs hope that there is a curriculum which can enhance the creativity and innovation of the students by considering input from experts in the curriculum preparation. Besides, this research revealed that the students of Technology and Vocational Education, lecturer of entrepreneurship course, needs a development of learning model which supports entrepreneurship pedagogy especially in Technology and Vocational Education.

Keywords— needs analysis; entrepreneurship pedagogy; technology and vocational education.

I. INTRODUCTION

Technical Vocational Education and Training (TVET) is generally aimed to prepare students and graduates to become productive, able to work independently in accordance with the competence of expertise, not dependent on availability of job vacancies, so that it can give effect to the national economy and also increasing number of entrepreneurs in Indonesia. Vocational education in higher education can be successful if it is able to cultivate the essence and existence of human resources (HR) through vocational education locally, nationally, regionally, and globally. Realizing the goal of TVET in higher education either the need to vocation process with the introduction of the subjects of the practical world of work and industries through industrial visits (IV), the industrial practice (IP), the provision of vocational guidance or training applied to students who need jobs and entrepreneurship as the areas of their expertise. It can be concluded that the qualified TVET is the spearhead in facing and winning the free market (ASEAN and the International).

The basic principle of Organizing TVET is placed by Charles Prosser (Prosser's Sixteen Theorems) in 1925 as the theory of vocational education/vocation where it is also the reference of organizing TVET in Indonesia. It holds 16 theories of organizing TVET which is oriented to the world of work, challenges, and needs. Various efforts in implementation of vocational education refer to the world of work, challenges, and needs are still not running as should be. Especially, in the challenges of educated unemployment in Indonesia, limited job opportunities which are incompatibility with the vocational education graduates is very high.

BPS reported that the number of unemployed in Indonesia on August 2015 is 7.56 million people, increasing 320 thousand people compared to the same period in last year 7.24 million. Besides that, a very concerning, based on the daily national newspaper, 495.143 unemployed is bachelors [1]. Based on BPS data of the number of educated unemployed of university graduates in February 2015, the educated unemployment rate in Indonesia is 7.45 million or

5.81 percent. This number is increasing, compared to 7.15 million or 5.70 percent in February 2014. Based on this data, the role of universities must immediately provide a real alternative solution so that it does not increase the number of educated unemployed of universities graduates every year.

Facing these challenges, various efforts have been initiated and programmed by the government by promoting the entrepreneurship program in the community, high school, and higher education. It also has been incorporated in the current curriculum (entrepreneurship education / entrepreneurship) by education agency and government of Indonesia.

Vocational and educational entrepreneurship two things that cannot be separated, because in addition to prepare students who are skilled in work and science that was involved, but the vocational education and vocational also aims to prepare graduates who are not only dependent on jobs available or expected to increase and develop their creativity amid demands and competition is so competitive. The quality of graduates of vocational education and vocational education is the backbone of Indonesia in facing the challenges of economic society Asian (MEA) which was enacted in 2016, this era signifies and competition in the workforce more competitive, especially ASEAN countries and one being concerns us all is the readiness competitor higher education graduates in the labor market with other countries. While the Human Development Index (HDI) in 2014 the state of Indonesia was ranked 108 out of 147 countries. based on four categories of human resource development (very high, high, medium, and low human development) Indonesia is in the category of medium human development which means it is still much below the other ASEAN countries such as Malaysia, Singapore, and Thailand. One of them is caused by the low quality of education and higher education graduates (vocational) who are still dependent on the availability of fieldwork that educated high unemployment rate that has always been the main problem today.

Graduates and future graduates of higher education especially vocational and vocational education should have the ability to entrepreneurship (entrepreneur) to be able to create new job opportunities, without having to rely on the availability of existing jobs and reduce educated unemployment. Therefore, higher education and vocational education must change the paradigm that has been preparing graduates looking for work become the creator of occupations can be packed field through curriculum development and teaching of entrepreneurship education.

Entrepreneurship education is expected to be the spearhead of the problems faced by vocational education, as well as economies problems faced by Indonesia with high unemployment. In fact, the education of entrepreneurship have not implemented as expected. It is caused by less optimal outcomes of entrepreneurship education in higher education. It can be seen from the curriculum which is mainly oriented to the theory and less supported by practice so that experiences got by the students are still unclear. It is inversely proportional to the theory of Prosser where in the process of implementation of TVET, one of them known as the theory of "*gainful employment*", in which education and vocational training that form the habit of working and

thinking, are derived from the experiences of training. There are no clear details of standards competencies, lack of experience of teachers in entrepreneurship. As suggested by the theory crafts person Prosser, teacher (a skilled teacher) will lead the TVET becoming effective as well as educators / experienced (competencies) instructors in learning process (entrepreneurship).

Vocational education graduates capable of independent, and does not depend on the jobs available because besides being able to work professionally vocational graduates in higher education is expected to create jobs in areas of science and its market opportunities. Therefore, the process of vocational education in college is not just oriented printer professional workforce and market-oriented (public and industrial), but it is expected that graduates of vocational able to develop competencies in entrepreneurship are packaged in education and teaching in accordance with one of the tri dharma college, and is expected to graduate college (vocational) can generate a lot of young entrepreneurs, which directly increase the rate of the economy of the country.

Entrepreneur is derived from the French word means "between (among)" and "to take (take)". Meanwhile, according to Timmons "Entrepreneurship is a human, creative act that builds something of value from practically nothing. It is the pursuit of opportunity Regardless of the resources, or lack of resources, at hand. It requires a vision and the passion and commitment to lead others in the pursuit of that vision. It also requires a willingness to take calculated risk. Based on the opinion of Timmons, we can conclude that entrepreneurship education relating to personality, creativity, vision, and commitment to build value and opportunity for entrepreneurship it requires a willingness to take calculated risks. Indonesia alone educational entrepreneurship is not new because entrepreneurship education began to appear in Indonesia in the 1980s, but in 2000-an entrepreneurship education increasingly major project to support the economy with the number of young born entrepreneur Indonesia. so that the Indonesian government began to encourage the development of entrepreneurship education through student activities, as well as through improving the quality of learning entrepreneurship education.

Teachers (lecturers) Competencies play important role in achieving the goal of national education, especially in TVET as the paradigm shift in the 21st-century learning process of TCL (Teacher Centered Learning) to SCL (Student-Centered Learning). Teacher-Centered Learning (TCL) is teachers / lecturers became the central figure in the learning process. It leads lack of creativity of students in the learning process. Overcoming such case, the necessary change is the learning of TCL to SCL. SCL places students as the central learning (Subject) active, independent, and teachers as facilitators and partners in the learning process. It stimulates creativity, and students` independence is very expected. The shifting of learning process is not easy for lecturers / teachers in managing and realizing the expected learning process. Lecturers / teachers are required actively to continuously improve the four teacher competencies; competence Pedagogy, Professional, personality, and social competence in managing learning process. As the learning of 21 century

(SCL), teachers are not only as a major source of study, but students are required to actively develop their knowledge both inside and outside the classroom.

Competence is needed to carry out the functions of the teaching profession especially pedagogic competence. Pedagogical competence is the most important part of the main four key competencies that must be owned by a teacher. It is the ability of a teacher to manage the learning process of learners. Besides, the pedagogic ability is also shown to help, to guide and to lead the learners. In accordance to [2] which is concerning to the standard of academic qualifications and competency of teachers in vocational subjects. Teachers' pedagogical competence comprises of ten core competencies as described below;

1. The ability of mastering the characteristics of learners from the physical aspects, moral, social, cultural, emotional, and intellectual
2. Mastering the learning theory and principles of learning that educates
3. Developing a curriculum related to the development of teaching
4. Organizing educational development
5. Communicating effectively, empathetically and politely with learners
6. Organizing the assessment and evaluation of the process and learning outcomes
7. Utilizing the results of the assessment and evaluation for the importance of learning
8. Reflecting action to improve the quality of learning
9. Using information and communication technologies for the benefit of the organization of educational development
10. Facilitating the development of student potentials to actualize various potentials

Entrepreneurship pedagogy is simply interpreted as how to teach entrepreneurship. Pedagogy entrepreneurship or entrepreneurship is an important noticed because it is closely related to the theory of entrepreneurship, teaching methods and strategies to teach entrepreneurship. Teaching entrepreneurship is the process of facilitating individual concepts and skills to be able to identify business opportunities and insightful, confident and have the ability to act [3]. Teaching entrepreneurship aims to inspire students, evoke emotion, and a change of mindset [4], [5]. Entrepreneurship education is defined as the delivery of entrepreneurial knowledge to students in terms of concepts, skills, and behaviors [6] and continued to be an entrepreneur [7], [8]. Researchers such as [9], [10], [11], [12], and [13] observed the importance of theory in teaching entrepreneurship to students. However, other research has shown that there are a number of problems associated with the theory of entrepreneurship are delivered to students on entrepreneurship education in today's conditions [14]. One particular concern is the number of entrepreneurship programs continued to emphasize the transfer of knowledge and information [15] in a manner consistent with the usual and traditional methods, which is less suitable for the field of entrepreneurship [10], [16], The reason that it is difficult to analyse and teach entrepreneurship [17]. So the fundamental question is how the concepts, theories and business planning

can be transferred to the students? According to [18] that effective pedagogy for teaching entrepreneurship requires a combination of theory and application.

The pedagogic ability according to [19] is also called as the ability in learning or education that includes understanding the characteristics of the students and their development, to understand some of the concepts of education that help students mastering some teaching methodology which is appropriate to the material and students' development, and mastering the appropriate evaluation system and enhance the students' ability. It is in line with learning entrepreneurship subject, the course is intended to broaden the students to the world of entrepreneurship and motivate them to become directly involved in the world of entrepreneurship as an strong entrepreneur, so that they can contribute in improving the quality of vocational education and vocational in higher education steeper and increase the Indonesian's economy.

Based on the problems described above and the important role of pedagogical competence of teachers in creating an effective learning process, the need on needs analysis of students towards entrepreneurship pedagogical competence of teachers / lecturers and vocational technology education in higher education of Faculty of Engineering of The State University of Padang to identify to what extent the current conditions and priorities (expectation) of students towards the teaching and learning entrepreneurship (lecturers' pedagogical) in higher education.

II. MATERIAL AND METHOD

The research was carried out by using needs analysis model to describe discrepancy between current condition and students' expectation towards lecturers' pedagogical competencies in TVET in higher education. The survey was conducted in Faculty of Engineering of The State University of Padang. Representative sample was taken based on random technique sampling with the total sample is 208 students which consist of six departments which have taken entrepreneurship subject.

TABLE I
RESEARCH RESPONDENT

Research Sample	Total Respondent
Electro Engineering	47
Electrical Engineering	35
Civil Engineering	37
Mechanical Engineering	25
Automotive Engineering	30
Mining Engineering	34
Total	208

The research instruments were developed with linker scale of indicators that have been tested and its reliability and validity to 30 students who did not go to the sample. Data were analyzed using SPSS and analyzed using descriptive statistics.

TABLE II
INSTRUMENT OF RELIABILITY AND VALIDITY

Respondents	Validity	Reliability
30 Students	All item is valid	,956

III. RESULT AND DISCUSSION

A. Results

Based on the data analysis using SPSS statistical program, in general overview of the extent of the difference between current conditions and priorities (expectation) of students to teaching entrepreneurship (lecturers` pedagogical) in higher education.

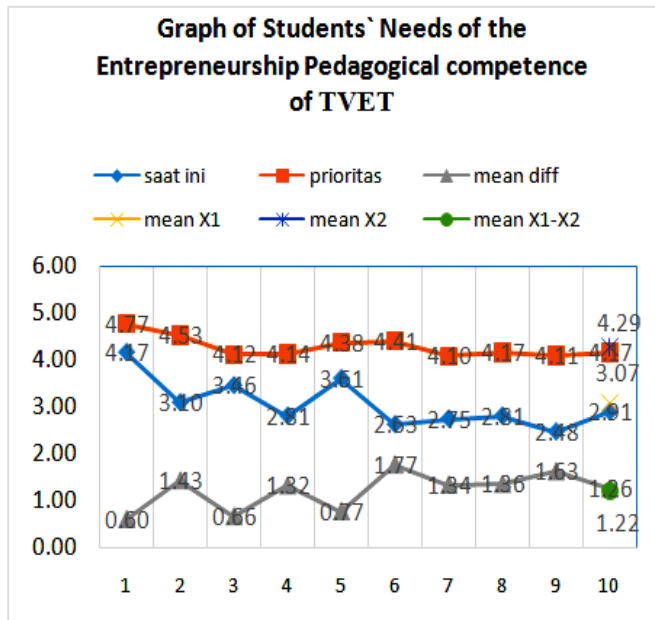


Fig. 1 Current condition and students` priority towards entrepreneurship pedagogical competence of TVET

Remarks:

1. The ability of mastering the characteristics of learners from the physical aspects, moral, social, cultural, emotional, and intellectual
2. Mastering the learning theory and principles of learning that educates
3. Developing a curriculum related to the development of teaching
4. Organizing educational development
5. Communicating effectively, empathetically and politely with learners
6. Organizing the assessment and evaluation of the process and learning outcomes
7. Utilizing the results of the assessment and evaluation for the importance of learning
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B. Discussion

1) An Overview of the Current State of Entrepreneurship Pedagogical Competence of TVET

Based on the aspects of the current state of entrepreneurship pedagogical education technology and vocational training in higher education by the students are still in the category of enough which can be figured on number of 3.01. The data analysis illustrates that need to

increase substantially, especially in the competence 4,6,7,8,9,10 which is still in a state of low. Competence numbers 2, 3, and 5 in the category of enough, while the competence number 1 is in the category of enough, on average of 3:07.

In general, the students' perception towards entrepreneurship training is still far from their expectations. It is because chart 1 describes that is only competence number 1 (one) are high (because the teachers have been able to read the characteristics in many aspects, but it is inversely proportional to the timely implementation of educational process (4, 6, 7, 8, 9,10), the teachers face difficulties in digging and facilitate them in the field of entrepreneurship. Meanwhile, [20] argues that "Characteristics can include talent, interests, attitudes, learning motivation, learning styles, the ability to think and ability early on its existing "Once teachers have understood the characteristics of learners, the learning process is expected going well and also can achieve the learning objectives. So the purpose and process of learning entrepreneurship is running effectively and efficiently.

The opinions above confirm that achieving learning objectives effectively and efficiently, greatly depends on the implementation process (curriculum) designed by the teacher, because the teacher becomes a facilitator in the learning process and in that process the learners explore the potential in themselves. Besides that, needs of designing learning relevant to the needs of the workforce and its application on the job would be mandatory for professors today [21], [22]. Vocational education is necessary facilitated by a curriculum that can apply scientific approach to project-based learning, so that the learning process has a long-term impact [23], as it also many factors that influence career vocational education in shaping the world of work [24].

The implementation process (curriculum) designed by the teacher, so need to pay attention to aspects of the student. What has been done so far on entrepreneurial learning in particular pedagogy of entrepreneurship is an important consideration for vocational education. Pedagogy of entrepreneurship in vocational education that occurs in the learning process is still applying the same entrepreneurship pedagogy and general, when compared to the scope of social science there is no significant difference. Whereas vocational learning process is different from the social sciences. Besides that, the teacher becomes the focus of the scenario pedagogy of entrepreneurship in vocational education. Teachers on pedagogy of entrepreneurship in vocational education is required to have experience in the industry and experience of teaching entrepreneurship, so that the model of pedagogy of entrepreneurship that is able to respond to market needs can be missed.

2) Priority and needs of Entrepreneurship pedagogical of TVET

Referring to the data analysis of Fig. 1, it illustrates that students have great hope (to have high expectations of the learning process (pedagogical) entrepreneurship. Their expectations towards the 10 (ten) Lecturers` entrepreneurship pedagogical in the high category with an average of 4:29, and the distance (discrepancy) between the current conditions and the needs / expectations of students

on average score of 1:22, which means there are some significant competence distance (can be seen in chart 1). It means that, students need a learning model development which is more effective and efficient.

Achieving the goal of effective teaching of entrepreneurship is not easy for a lecturer or teacher, because besides there no a clear formulation of the achievements of entrepreneurship learning but the experience of teachers in the field of self-employment or entrepreneurship is not yet fully so, there are many students looking less seriously in the learning process. Educating the learning process is not about having experience, proficient in a particular field but how to educate people to learn and it requires competence of teachers (pedagogical, professional and personal competence). [25] States that:

Naturally, learning is done to develop the activity and creativity of learners through a variety of interactions and learning experiences. In this case, the interactive atmosphere between students and teachers is in the learning using the components such as materials, media, methods, resources and learning evaluation.

Pedagogical competence is a person's ability to educate or teach. Becoming a professional teacher should have the pedagogical competence. National Education Standards, Article 28 paragraph (3) point a, suggested that pedagogical competence is the ability to manage learning of learners that includes an understanding of the learners, the design and implementation of learning, evaluation of learning outcomes, and the development of learners to actualize their various potentials.

Following up problems that occur from exposure to the above, it is necessary and very urgent conducting modifications the various methods or learning models tailored to the needs will accomplish the learning goals of entrepreneurship education and vocational technology, which can also support the pedagogical competence of teachers / lecturers in teaching. Thus, learning can include all teachers experience applied to the learners. The more intense lived experience of learners, the higher quality of learning. Then, Entrepreneurship education begins with an entrepreneurial attitude influenced entrepreneurial model formed in vocational education [26]. Entrepreneurship education in vocational education can only be realized if the learning process-oriented work activities and products such as learning-based production and work base learning [27], and models appropriate learning will affect the ability of competence and growing interest in self-employment [28], [29], [30], [31].

3) Production-Based Learning Model as One of The Entrepreneurship Pedagogy Approach in Vocational Education

Development of vocational education, which is equipped with a highly entrepreneurial competence, became a spear in decreasing well educated unemployment graduates of non-vocational and vocational graduates. The process of vocational education in college is not just a labour producer and market-oriented but is expected vocation of college graduates are capable in developing competency-based individuals in the field of entrepreneurship, which is

expected to graduates of vocational universities graduates can generate a lot of young technopreneurship.

However, the challenge those students tend to complain that the theory and the study of entrepreneurship were boring. It is boring entrepreneurship courses, as well as all the theory and entrepreneurship courses, could be relevant to the conditions that occur in the field [32]. So that alternative solutions should be sought immediately through the development of entrepreneurship pedagogy of production based learning model production on vocational education in higher education. Model of production based learning model is very relevant to vocational studies by facilitating learners to develop their thinking, and producing products [33], [34], [35].

One learning model that is relevant to the vocational field is the production-based learning model, this model facilitates the learner to think, analyse and capable of producing the product [33], [34], [35]. This model allows it to be applied to the field of vocational entrepreneurship pedagogy, because it contains elements of the complete application and theory. In addition, the entrepreneurial learning process for learners to master the material of entrepreneurship with the concept of learning by doing through production based learning model. These explanations are relevant to the research conducted on the development of entrepreneurship pedagogy through production based learning model on vocational education in higher education.

Besides that, why production-based learning model has a power that is highly relevant to entrepreneurship in vocational education, one of the nine, the stage production based learning there are steps to create a business plan. Through this production model based learning students are trained to think critically, creatively and boldly convey ideas and explore into a product that will be made into a finished product design is oriented to the needs of society and industry by not waive existing competitors. After the resulting product, then create a business plan or business plan of a product that has been made. In creating a business plan indirectly student has done the analysis and evaluation of the competitors, especially related to product quality, sales price and how it took consumers with the products we make. This process will return to the initial idea and construct reset and revision of ideas and explore back both resources and other technical aspects, thus indirectly will add experience and improve understanding of competence (cognitive, affective and psychomotor) as well as the entrepreneurial skills of students, which will affects the growth of student interest in entrepreneurship. Obviously this condition will be better if strengthened from the stakeholders, where all works and products of students in the form of goods or services the idea feasible facilitated and supported as much as possible in order to strengthen the level of student confidence and belief will be successful in the future.

Business plan production based learning aims to improve product design student results in learning, so that the product can be used for students in the sale so that it can help increase student interest in entrepreneurship. Business plan developed in accordance with products produced student learning. The resulting product is relevant to the material to be controlled by the student in the learning process and the

resulting product is relevant to the market product standards. By producing products in addition to increasing student learning process of science can also produce marketable products. Business plan production based learning is the development made in order to achieve one of the goals of vocational education is to prepare students to be able to have competencies that can help him to be ready to open up employment opportunities after graduation. Students need to strengthen the technical nature of science integrated with the learning program, production of Model-Based Learning is one alternative that can facilitate this. Challenges conditions of free competition and entered the era of the Asian Economic Community (AEC) or "ASEAN Economic Community" (MEA) or the ASEAN free market and the increasing unemployment of educated, then through a product-based business plan prepared for the students strong in facing the challenge of free competition. In connection with it, according to [34], that Model-Based Learning Production may increase interest in entrepreneurship students. That participant can be seen from the activity of students in learning, especially in the implementation of the business plan to discuss the problem. In addition, referring to the results of a needs analysis conducted integration of materials entrepreneurship in the form of a business plan on teaching practicum in vocational education or vocational is very urgent, because students can already imagine in addition to the skills knowledge and competency of each student if given the stock material practical entrepreneurship so that confidence and readiness to survive in field for the better, rather than just relying on the scientific side alone.

Obviously with the learning process which was originally only limited by exercise or exercise began to raise to the by-product or product, but only to the extent the demands of college and the curriculum. These conditions are for this to happen the student has produced only limited products but only products which requested the curriculum is not based on the needs of users and orders. So that at a later stage through Production Based Learning model with nine syntax / stages to facilitate not only limited by exercise and by-product, but also capable of by project and by order. So that a production unit and a business center which owns the forerunner of the birth of this learning process, which is managed professionally and seriously and have an impact on the additional income of Higher Education. Production and business units center can work together with a business partner or associate membership of allied for the stage by project and by order demands not only a curriculum alone but the community needs, and the needs of the business / industry.

IV. CONCLUSIONS

Entrepreneurship pedagogical competence of lecturers / teachers should be improved in order to achieve the learning objectives effectively and efficiently. Developing the entrepreneurship pedagogical approach to learning model of problem-based learning because the learning process is to train the entrepreneurship students to learn solving and analyzing the problem, so that learners can make creative and innovative thinking that should be output of the subject of entrepreneurship. In conclusion the difference between the current conditions and priorities in the learning process

for students` entrepreneurship TVET in the Faculty of Engineering of The State University of Padang have enough different distances and significant especially on certain competencies. Answering their needs, it needs to develop a learning model of problem-based learning that is able to support the entrepreneurship lecturers / teachers pedagogical ability in TVET.

Besides that, based on the analysis of the needs of the pedagogy of entrepreneurship in vocational education, can we categorize three issues, namely: planned and directed, continuous, and relevance. That is, improving the quality of human resources (educators) needs to be done and improved so as to minimize problems face. If we explained one by one, we may conclude that; 1). With entrepreneurship learning steps planned and precisely the emergence of a similar concept of clear understanding of the purpose of entrepreneurship education by learners. 2). with a continuous learning or continuing between theories one another or the first meeting until the end of the meeting, the students built a structured competency. 3). the relevance of the objectives of the course, the field of science that was involved, and the needs of industry and society so that learners can do for themselves what they will do will be able to minimize or realize a job and without having to rely on the jobs available. Based on thorough study and relevant it can be concluded and required a learning model that is able to improve pedagogical faculty in teaching students and makes the quality of education and teaching entrepreneurship planned and directed, and relevant to their competence and the world of industry and society.

Entrepreneurship education in higher education has a very good impact on the quality of students and graduates from college. Entrepreneurship education in vocational even very important because in addition to graduates in vocational education has competence, graduates are also required to have a good attitude and entrepreneurial competence. Vocational education students in the mental construct capable of working in the field but without being accompanied by the entrepreneurial experience will be a problem in the future. Vocational graduates who have entrepreneurial provision must be able to compete in the job market, and survival. Entrepreneurship education with production-based learning approach gives students the opportunity to be able to apply the results of project work in the form of a business plan that has quality and high selling power. In addition, the independence and entrepreneurial attitudes will also grow and emerge as the integration of entrepreneurial learning in vocational education. soul and spirit of entrepreneurship needs to be transmitted and improved on the students, this will have an impact on the environment of vocational education for the better. Based learning is very precise production basis pedagogy development of entrepreneurship in vocational education, and policies and rules are needed to realize the competence of graduates of vocational education quality.

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