Student’s ability to applying biotechnology in entrepreneurship

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Abstract. The process of biotechnology learning actually tends to relate learning content to real-world situations. However, in reality, students have not been able to apply the knowledge acquired in the class to their daily lives. Thus, it will have an impact on students’ low enthusiasm for entrepreneurship. This study aims to reveal the causes of students’ low ability in applying biotechnology. The type of this research is descriptive research. The participants of this study are 100 university students and four lecturers of biotechnology. Data collection instruments used are questionnaires for the students and interview guidelines for the lecturers. The sampling method used is purposive sampling. Students have low ability in applying biotechnology in entrepreneurship. Students need to be supported by the availability of teaching materials that integrate contextual teaching and learning approaches (CTL) that can motivate students to find the relevance of their learning with the real life. This finding shows that it is necessary to provide teaching materials that integrate contextual teaching and learning approaches (CTL) in the learning process.

1. Introduction
In line with the development of science and technology that is supported by a large current of globalization from time to time, it increases competition in various fields of life. The world of education that will produce a reliable and quality young generation is expected to be a means of creating graduates who are ready to compete in various fields of life [1]. In this case, education plays an important role in facilitating students to face the challenges of scientific development [2]. Education that accommodates students to study science is carried out in universities. Based on the results of the study [3], learning science theories about experience can directly help students gain a deeper understanding and skills in finding out or called request processing skills or "inquiry skill ". Therefore, the university will provide facilities and infrastructure to support the knowledge that always develops along with the development of science knowledge and technology, one of which is biotechnology.

Biotechnology is one course to study in the universities. Biotechnology is a branch of science and technology (Science and Technology) which in the last decade has developed very rapidly [4]. The
rapid development of biotechnology as a science and as a tool is responsible for increasing rapid progress in various fields of life.

This is the fact that the high unemployment rate in Indonesia is caused by the low interest and motivation of Indonesian youth to create jobs, especially the college graduates who choose to settle in a comfort zone by entering the workforce in the company without any desire to create jobs [5]. Various efforts have been made to improve the entrepreneurial spirit, especially by changing the graduates’ idea from "an employee" to "a boss" never succeed. Thus, being an entrepreneur is very necessary now, not only for self-interest, but the most important is for our dedication to the nation and the country by creating jobs for the community [6].

2. Research Background

2.1 Biotechnology

Biotechnology is actually an interesting topic because its application is closely related to aspects of life skills [7]; one of them is in entrepreneurship. Thus, biotechnology and entrepreneurship are intrinsically linked together [8]. Entrepreneurship has been developed since 1700, but consensus makes entrepreneurship positively related to economic growth, by introducing new ideas, new processes, new products, new services and new business opportunities [9].

Biotechnology strongly supports students for entrepreneurship because some traditional biotechnology products are commercially available in the local market. These products include yeast, soy fermentation and others. [10] Based on the results of the study, [10] it is known that currently in Indonesia, there are 70% of 4,135,975 high school students and only 30% for vocational students while the university registration rate is only 29%. More than 71% or 2,055,580 high school graduates return to the community without life skills. Therefore, the entrepreneurial spirit is very important so that it can inspire students to create job opportunities in the community and can be part of reducing poverty [11].

2.2 Availability of Teaching Materials

The availability of teaching materials that are less facilitated in learning will have an impact on students' low scores [12]. According to [3] the availability of adequate teaching materials can obtain meaningful learning. Teaching materials are the basic hands of students that can be used to study independently. [13] states that teaching materials can develop students' motivation to learn, so that the learning objectives expected can be achieved. Teaching materials can also improve critical thinking skill; understand concepts and students' attitudes towards learning [14]. In addition, teaching materials are a means of sending systematic information and appropriate to achieve competence [15]. Lecturers must make sure that the learning materials are up-to-date. Research conducted by [16] finds that biotechnology requires learning materials that can make learning more applicable and contextual. Therefore, efforts must be made to develop teaching materials that connects material in the context of life so that the learning process is more meaningful. A study conducted by [10] that integrates the CTL approach has proven effective for linking class concepts mastered with the real life problems [17].

Contextual Teaching and Learning (CTL) has been introduced as a learning approach to fill gaps in scientific theory and life context [18]. Students realize that what they learn is useful for the next life. That is why students take the position of someone who needs life in the future. They know what is useful for them and try to achieve it through teachers as a director and counselor [19]. According to [20] the CTL process emphasizes the development of meaningful relationships, constructivism, inquiry, critical thinking, creativity, community learning, and authentic assessment.

3. The purpose of this study

The purpose of this study is to determine the ability of students to apply biotechnology in entrepreneurship. The results of this study can be used as a guide to improve the provision of effective teaching materials to improve students' entrepreneurship in the biotechnology learning process.
4. Method

4.1 Participants
The study participants are 100 students who have taken and are taking biotechnology courses. This course is taken from four universities in Padang City. In addition, 3 lecturers of biotechnology courses are also taken from 4 universities in Padang City.

4.2 Instruments
The instruments used in this study are interview guidelines for the lecturers and questionnaires for the students. Interview guidelines contain questions about biotechnology learning, availability of teaching materials and students' understanding of biotechnology materials. The questionnaire used in this study contains students' attitudes toward biotechnology learning and an ideal biotechnology learning according to students’ view. The questionnaire is semi-closed type that consists of two scales ”yes” or ”no” accompanied by reasons. For this study, the questionnaire used is in the form of positive posts. Questionnaires using negative sentence patterns can reduce the score of questionnaire validity [21].

4.3 Data analysis
The results data of the research are analyzed by using descriptive statistical analysis.

5. Results

5.1 Biotechnology learning in the classroom

| Table 1. Interview Result with Lecturers of Biotechnology |
|---------------------------------|-----------------|
| Aspect of questions | Interview Results |
| Learning method. | Lectures and discus. |
| Media. | Power point and textbook. |
| level of student understanding. | Students are generally familiar with the material being taught, but students have not been able to apply this knowledge in the real lives of those. |

Based on the interview results with 4 lecturers in the field of biotechnology, it is known that in general, the methods used in the learning process are lecture method and discussion. In addition, 75% of the media used are in the form of Mic. power point slides and 25% use textbooks. In Table 1, note that students can understand generally the concept of biotechnology with good material, but students' ability to apply biotechnology in real life is low because the Contextual Teaching and Learning (CTL) approach has now been integrated in the learning process.

5.2 Availability of learning materials

| Table 2. Analysis Results of Student Questions and Needs |
|---------------------------------------------------------|
| Aspects | Percentage (%) |
| Lecturer provides teaching materials in the form of power point slides | 80 |
| teaching materials help learning | 56 |
| teaching materials should include pictures and video | 97 |
| teaching materials should be integrated CTL approach | 88 |
Based on the data in Table 2, it is known that in general, the lecturers use teaching materials in the form of Mic. power point slides during the biotechnology learning. So students only understand the concept of biotechnology material without applying that knowledge in real life. The next data shows that students need instructional materials that include pictures and videos to help students connect the concept of material with matters related to entrepreneurship. This is in line with the data above that students agree that if the instructional material is integrated with the Contextual Teaching and Learning (CTL) approach.

5.3 Student's Attitudes towards Biotechnology

Table 3. Results of Student Attitude Questionnaire on Biotechnology

| Aspects                                                                 | Percentage (%) |
|------------------------------------------------------------------------|----------------|
| Students interested in studying biotechnology                         | 84             |
| Students understand biotechnology important to life                    | 81             |
| Students know the benefits of biotechnology in the lives of students   | 71             |
| students can apply the knowledge of biotechnology in the lives of      | 39             |
| students interested in entrepreneurship after studying biotechnology   | 21             |

Based on Table 3, the data indicate that students show a positive attitude towards biotechnology. Students who are interested in studying biotechnology know the important role of biotechnology for real life and understand the benefits of biotechnology for people's lives. But the students' ability to apply the knowledge about biotechnology is still low. Therefore, the students' passion for entrepreneurship is low.

6. Discussion

Biotechnology is actually an interesting topic because its application is closely related to aspects of life skills [7]. One of them supports students for entrepreneurship because some traditional biotechnology products are commercially available in the local market. These products include yeast, soy fermentation and others. Therefore, students need to be given understanding and increase the entrepreneurial spirit in the learning process to create employment opportunities in the community and can be part of poverty reduction [11].

Based on the data gained from interviews with the lecturers of biotechnology in the city of Padang, it is known that the lecturers use the lecture method (direct learning model) in the learning process. The lecturers' direct model only explains the material in concept form without inviting students to open entrepreneurship opportunities. The biotechnology learning also uses discussion methods that can improve students' understanding of the material being taught but the students' ability to apply biotechnology in real life is still low. In addition, the researchers also obtain data on students' attitudes toward biotechnology. Based on the student questionnaires, it is found that students are very interested in learning biotechnology and knowing the benefits of biotechnology in life but the students' interest in entrepreneurship is still low.

In addition, in terms of the teaching materials availability, lecturers only provide teaching materials in the form of Mic. power points so that biotechnology materials are as conductors. One of the efforts made to improve students' abilities in applying biotechnology is by providing contextual teaching materials [22].
Teaching materials are one of the important elements in the learning process. Teaching materials can develop students' motivation to learn, so that the expected learning objectives can be achieved. Lecturers need to develop the teaching materials with pictures and videos to connect the materials in real life contexts. Based on a study conducted by [10], integrating the CTL approach has proven effective for linking the concept of class learned with real life problems. This is in line with the results of this study that the students agree if the teaching material is integrated with the contextual teaching and learning approach (CTL).

7. Conclusion
In line with the development of science and technology which is supported by a large current of globalization from time to time, it increases competition in various fields of life. Therefore, students are required to apply biotechnology in entrepreneurship in order to compete in various fields of life. Based on the results of research that has been done, it can be concluded that the students’ ability in applying biotechnology in real life is still low. The low ability of students is related to the unavailability of contextual teaching materials. Based on the results obtained from this study, it is necessary to develop teaching materials based on contextual teaching and learning (CTL) in the learning process.

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