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Integration of Entrepreneurship Education with Biology Education Study Program Courses: Student Perceptions

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Abstract

This study aims to explore biology education students' perceptions of integrating entrepreneurship education with courses, interest in entrepreneurship, and self-efficacy. This study is an exploratory descriptive research, the respondents were 77 biology education students at UIN SYAHADA Padangsidimpuan. The instrument used was a closed questionnaire with the Guttman scale. Research data was analyzed descriptively and inferential statistics using the Kruskal Wallis test. The results of the study are: 1) student perceptions regarding the integration of entrepreneurship education are very positive, as many as 83.1% of students feel that integration needs to be implemented. Based on the Sig value (0.86 > 0.05), there is no significant difference between the perceptions of semester III, V, and VII students; 2) Students' entrepreneurial interest is relatively high, namely 77.9% of students are interested in entrepreneurship. Based on the Sig value (0.43 > 0.05), there is no significant difference between the interests of semester III, V and VII students; 3) Student self-efficacy in entrepreneurship is classified as moderate, namely only 50.6% of students believe in their abilities. Based on the Sig value (0.07 > 0.05), there is a significant difference between the self-efficacy of students in semesters III, V, and VII.

Keywords : Entrepreneurial Integration, Entrepreneurial Interest, Self Efficacy

INTRODUCTION

Population density continues to increase from year to year giving rise to several problems including poverty, unemployment, unequal education, lack of agricultural land, health impacts, and so on. Based on data from the Central Bureau of Statistics (2024), the percentage of underemployed people in February 2024 increased by 1.61 percent, while part-time workers decreased by 0.73 percent compared to February 2023. The decrease in the unemployment rate was due to the reduction in the unemployment rate among those with low

education (decreased 2 %) and medium (down 0.4 %). Meanwhile, the unemployment rate for the diploma graduate group increased by 0.2% and for undergraduates increased by 0.38%. This shows that job vacancies that can accommodate diploma and undergraduate graduates are not yet adequate. Those who are unsuccessful in getting a job are unable to create their own jobs because they lack skills beyond their qualifications. Students are expected to be able to become driving agents who pioneer the formation of a strong economy in Indonesia. Therefore, knowledge and entrepreneurial skills are needed from an early age as basic capital to advance the country, one of which is through the field of entrepreneurship.

The Ministry of Education, Culture, Research and Technology (Kemendikbudristek) stated that as many as 13.33% of college graduates were still unemployed (Rosa, 2023). In this regard, the Ministry finally launched the Independent Entrepreneurship Program in 2022. This program provides a platform for students to learn and equips them to become entrepreneurs. This activity is carried out outside the classroom in the form of training, mentoring and coaching to encourage and build entrepreneurial experience. In 2022, the Ministry of Education and Culture is targeting 10,000 participants and 15 universities to join this program. Based on these targets, it can be seen that there are still many universities that have not been facilitated by the Independent Entrepreneurship Program. This phenomenon requires the world of higher education to carry out a transformation in educational and learning practices so that it can produce graduates who are responsive to the challenges of the times and the needs of society (Suwandi, 2020).

Biology education has a very broad study covering abiotic (non-living things) and biotic (living things) including microorganisms (microbes), so it has the potential to be developed towards bioentrepreneurship education. Bioentrepreneurship is an integration between biological sciences and entrepreneurship (business science) which involves all aspects of living things. Therefore, it is necessary to utilize natural resources as best as possible so that they have maximum efficiency to meet the needs of human life. Bioentrepreneurship teaches the knowledge, skills and attitudes needed by an entrepreneur using biological concepts (commercialization of life sciences). Integrating entrepreneurship with biology courses can equip students to have the ability to find business opportunities, insight, skills and take follow-up actions. Entrepreneurship that can be developed includes making biotechnology products, making learning media with commercial value, vegetable business, making fertilizer using the concept of plant development, and so on.

Higher education has an important role in designing the curriculum so that it is able to shape students' thinking patterns that are critical, creative, innovative, collaborative, adaptive,

competitive, leadership and emotionally intelligent. Students who have these competencies are expected to be able to create jobs that can help economic growth. The study program, especially Biology Education, is a type of formal education aimed at developing entrepreneurship related to biology. The biology lecture program is expected to be able to facilitate students to develop entrepreneurial competencies based on biology.

UIN Syekh Ali Hasan Ahmad Addary Padangsidimpuan, especially the Biology Education Study Program at the Faculty of Tarbiyah and Teacher Training, has required entrepreneurship courses to be studied by students in the second semester. The number of credits allocated is 2 credits. This allocation is actually inadequate considering that the process of forming and developing students' life skills must be comprehensive and therefore requires a lot of time and repeated, structured and tiered experiences. Therefore, it is necessary to integrate entrepreneurship education with biology education courses. The courses that are integrated should be applied/applicable such as biotechnology, microbiology, urban farming, plant development, animal development, anatomy and physiology of the human body, invertebrates, and so on.

The integration of entrepreneurship into Biology Education study program courses will run well if there is a positive attitude from students regarding this matter. Therefore, it is necessary to carry out research that aims to determine the perceptions of Biology Education students in integrating entrepreneurship with Biology Education study program subjects, their interest in entrepreneurship, and their self-confidence in entrepreneurship.

RESEARCH METHODS

This research is an exploratory descriptive research (Sugiyono, 2017; Arikunto, 2016). This research aims to describe students' perceptions about integrating Biology Education courses with Entrepreneurship, students' entrepreneurial interests, and entrepreneurial self-confidence. The respondents were Biology Education students at FTIK UIN Syahada Padangsidimpuan, totaling 77 students. The instrument of this research is a closed questionnaire with answer choices using the Guttman scale. The questionnaire was prepared based on indicators of perceptions regarding course integration with entrepreneurship education, entrepreneurial interest, and self-efficacy as presented in Table 1.

Table 1. Indicators of Perceptions About Integration, Entrepreneurial Interest, and Self-Efficacy

Variable	Indicator
Perception of course integration with entrepreneurship education	1. Positive influence on future work. 2. Developing entrepreneurial interest and self-efficacy 3. Develop entrepreneurial knowledge. 4. Develop entrepreneurial skills. 5. Build awareness of business opportunities.
Entrepreneurial interest	1. Interested in business opportunities. 2. Find out business opportunities from various sources. 3. Enjoy making entrepreneurial plans 4. Enjoy creating your own business 5. Enjoys being creative when it comes to business
Self Efficacy	1. Confidence in being able to entrepreneurship 2. Confidence in being able to lead others 3. Confidence in being able to manage a business 4. Confidence in being able to start an entrepreneur 5. Belief is able to create a network of prosperity

Analysis of research data was carried out descriptively and with inferential statistics. Descriptive analysis is used to describe student perceptions, entrepreneurial interests, and self-confidence. Inferential statistics are used to determine differences in perceptions of Biology Education students in semesters III, V, and VII. The analysis technique used is the Kruskal Wallis test at a significance level of 5%. This test is used because the data variance is not homogeneous and not normally distributed. The results of the Kruskal Wallis test are seen from the Sig value, if the value is <0.05 then a statistical conclusion is drawn that there is a difference between the samples tested and vice versa.

RESULTS AND DISCUSSION

The research carried out covers several aspects including: 1) perceptions of Biology Education Study Program students regarding the integration of entrepreneurship education in study program courses; 2) interest in entrepreneurship; 3) Self-Efficacy. The respondents for this research were 77 students consisting of 18 students from semester VII, 20 students from semester V, and 39 students from semester III. Students gave positive responses regarding integrating entrepreneurship with biology courses, this was proven by 83% of students agreeing with this and 16.9% were still unsure. Those interested in entrepreneurship were 77.9%, undecided (19.5%), and 2.6% who were not interested. Self- confidence is still classified as moderate, namely only 50.6% have good self-efficacy, 36.4 are doubtful, and 13% do not have good self-efficacy.

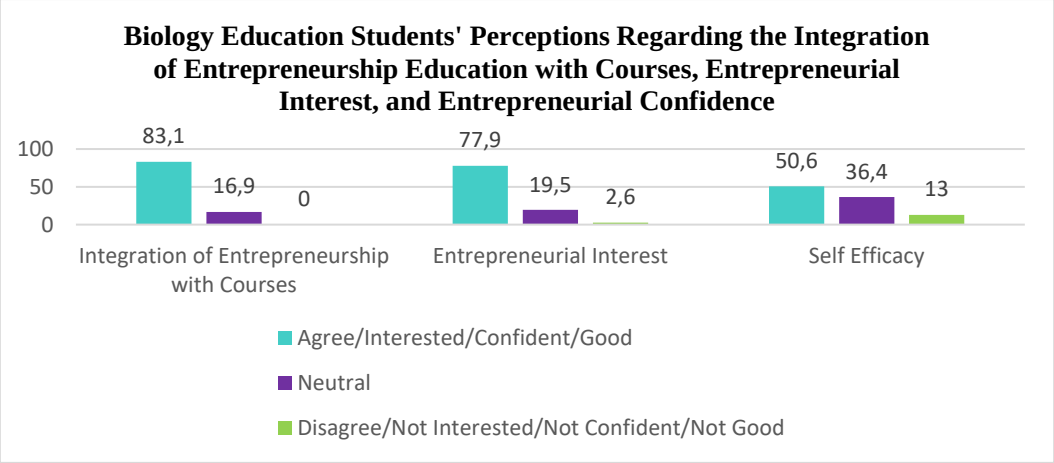

Figure 1. Perception Diagram of Biology Education Students Regarding the Integration of Entrepreneurship Education with Courses, Entrepreneurial Interest, Self-Confidence

Based on the picture above, it can be seen that integration of entrepreneurship education needs to be implemented. Students' entrepreneurial interest must also be increased so they can focus more on the integrated learning process. Students' entrepreneurial interests are not in line with their self-confidence, they feel less confident about opening a business because they feel less able to plan and manage it.

Integration of Entrepreneurship Education in Courses

The intense competition in the world of work requires Biology Education study program students to have additional skills beyond the ability to teach formally at school. Universities must be able to facilitate students to have sufficient abilities in order to survive in this demographic bonus period. One of the things that universities can do to answer this challenge is to integrate entrepreneurship education with biology education study program subjects. This is reinforced by the positive response of students, namely that 83% of students felt that it was necessary to integrate courses with entrepreneurship, and only 16.9% gave a neutral response. The learning outcomes expected in this integration are the formation of additional soft skills possessed by students or the younger generation as part of forming a generation that is ready to work and is multitalented. This is a potential alternative in the midst of intense competition in the world of work. Students preparing themselves to become bachelor of education graduates does not mean they can only work in the education sector, but in various other fields of science so they can compete in the global world (Jusniaty et al., 2022).

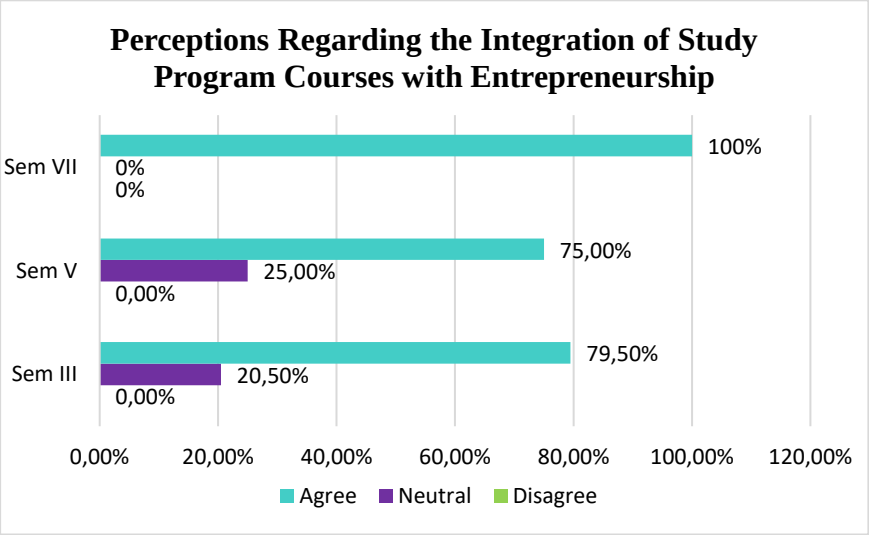

Figure 2. Diagram of Student Perceptions Regarding the Integration of Study Program Courses with Entrepreneurship

Based on the analysis carried out, the Biology Education study program at UIN SYAHADA Padangsidimpuan provides students with the opportunity to study entrepreneurial techniques in the second semester and has integrated courses in plant development, urban farming entrepreneurship, and biotechnology with entrepreneurship education. This course is studied in semesters IV, V and VII. The response from semester VII students was very positive, namely 100% of students agreed that the integration of biology courses with entrepreneurship was implemented. Meanwhile, 75% of fifth semester students agreed and 79.5% of third semester students. The results of the Kruskal Wallis statistical test show that there is no significant difference between the perceptions of semester III, V, and VII students regarding the integration of study program subjects with entrepreneurship education, this was concluded based on a Sig value of 0.086 > 0.05.

Table 2. Kruskal Wallis Test Results Regarding Student Perceptions Regarding the Integration of Entrepreneurship Education with Courses

Ranks				Test Statistics	
	Semester	**N**	**Mean Rank**		**Perception**
Perception	Semester VII	18	45.50	Chi-Square	4,897
	Semester V	20	35.88	df	2
	Semester III	39	37.60	Asymp. Sig.	,086
	Total	77			

If we look at the mean rank value, we find a slight difference in student perceptions. Semester VII has studied more courses that are integrated with entrepreneurship. This makes

them understand the importance of honing skills outside of teaching competency and is strengthened by the short period of study so that they start to think about what work they need to do before getting a job vacancy according to their qualifications. Therefore, it is important to develop lectures that enable students to connect biological concepts to entrepreneurial opportunities in Indonesia. Integrating entrepreneurial content into the field of life sciences (Biology/Biotechnology) is known as bioentrepreneurship. Bioentrepreneurship is a creative, innovative and contextual approach to biology learning by linking directly to real objects or phenomena around students' lives (Fitriah, 2016). This will make learning more meaningful, as product creation and product design activities will involve students actively in learning.

The availability of natural resources (SDA) including abundant biological resources (SDH) in Indonesia is a potential and challenge to be explored and developed through creative and responsible innovation for prosperity. There is a great opportunity and hope to achieve prosperity as well as a challenge to manage it into a useful product with a high selling value and a longer shelf life. Utilization of natural resources can become a renewable product if we can apply biological science and technology well. Bioentrepreneurship is an integration of biological sciences with entrepreneurship which involves all aspects of living things (Suanda, 2019b). Making organic fertilizer in the form of biological fertilizer as a result of the metabolism of microorganisms through the fermentation process of several organic materials as a form of application of the courses taught in the Biology Education study program.

Biology education at Strata 1 (S1) level in higher education is one type of formal education in Indonesia, which is currently aimed at having the ability to develop entrepreneurship related to biology, therefore a curriculum is needed that emphasizes lecture programs that can train entrepreneurial attitudes. students and in accordance with the Main Performance Indicators (IKU), especially the 5th IKU, namely the results of lecturers' work used by the community. Furthermore, in the 5th IKU it was explained that the results of research conducted by lecturers should provide great benefits to the surrounding community or receive international recognition (Directorate General of Higher Education, 2021). It was further stated in the 3rd IKU that lecturers can carry out activities outside campus. From these Main Performance Indicators, joint academic activities of lecturers, both between lecturers and students, for academic development that is beneficial to society are highly expected. (Suanda, 2022)

Making fermented foods from plants can support key performance indicators (IKU) in learning courses in biotechnology, microbiology, plant ecology, plant physiology and other

subjects (Suanda and Sumarya, 2019; Suanda, 2019a). This is in accordance with the 5th IKU which states that the results of research conducted by lecturers should provide great benefits to the surrounding community or receive international recognition (Directorate General of Higher Education, 2021). Students must have an entrepreneurial orientation with innovation and creativity to create a product based on bioentrepreneurship knowledge. Problem solving activities give students the opportunity to use their imagination and try to realize their ideas and potential. (Suanda, 2022).

Entrepreneurial learning and the influence of people around them (subjective norms) while on campus, have a positive role in facilitating students' self-development in the field of entrepreneurship. This is in accordance with Muliadi's opinion (2020c); Supeni and Efendi (2017); Setyawan (2016) states that entrepreneurship learning can facilitate students in a formal and structured manner to develop entrepreneurial insight, knowledge and skills. Furthermore, the entrepreneurial knowledge they have can change students' perceptions, attitudes and self-efficacy (self-confidence) in choosing entrepreneurship. In the end, this will foster entrepreneurial interest. According to Muliadi (2019) and Hattab (2014), the entrepreneurial knowledge that students have will influence their attitudes and interest in entrepreneurship. Students' knowledge of entrepreneurship will increase their interest in entrepreneurship, so that they will be able to create a new business and provide employment opportunities for other people (society) (Nabi et al., 2017; Sunarni, Zulkarnain & Benty, 2017). Entrepreneurship learning given to students has a positive impact on developing entrepreneurial attitudes and interests (Muliadi, Mirawati & Prayogi, 2021).

Higher education is a forum for students to develop their potential so that it has the fastest impact on changing superior human resources, because the time to leave higher education (PT) to the world of work and best practice is very fast. Higher education institutions must have tactics and strategies to continue to change in an agile and flexible manner (Melsa et al, 2022). In an effort to improve the quality of higher education and innovation in the field of education, courses in the Biology Education study program at UIN SYAHADA Padangsidimpuan need to be integrated with entrepreneurship education, especially applied courses.

Interest in Entrepreneurship

The results of this research show that students' entrepreneurial interest is relatively high, with 77.9% stating that they are interested in entrepreneurship. If we look further, the percentage of seventh semester students who are interested in entrepreneurship is 88.9%, fifth semester 75%, and third semester 74.30%. For more details, you can see the following image.

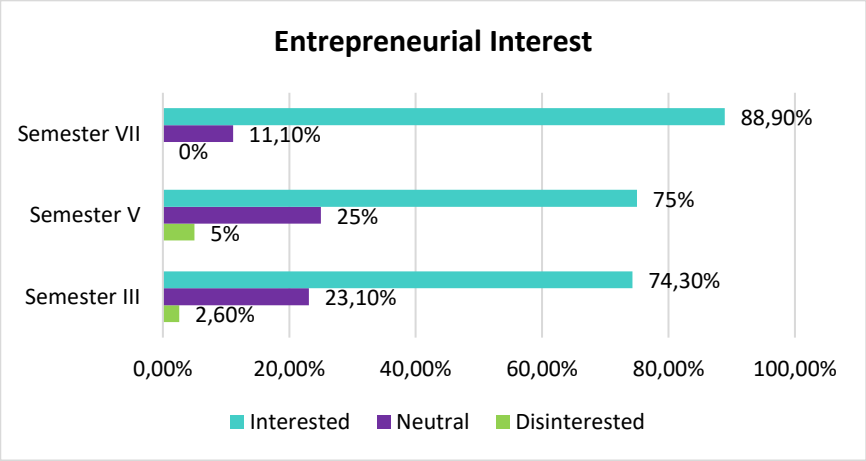

Figure 3. Student Entrepreneurial Interest Diagram

The results of the Kruskal Wallis statistical test show that there is no significant difference between the entrepreneurial interest of students in semesters III, V and VII, this was concluded based on the Sig value of 0.428 > 0.05. If you look at the presentation value and the average value, there is a slight difference, although it is not significant. The difference in percentages can be influenced by the biotechnology course in semester VII.

Table 3. Kruskal Wallis Test Results Regarding Entrepreneurial Interest

	Ranks			Test Statistics	
	Semester	**N**	**Mean Rank**		**Perception**
Perception	Semester VII	18	43.33	Chi-Square	1,696
	Semester V	20	37.70	df	2
	Semester III	39	37.67	Asymp. Sig.	,428
	Total	77			

The interest in entrepreneurship is not born from humans but grows and develops according to the factors that influence it (Kusumajanto, 2015). Entrepreneurial interest is the tendency of the heart to be interested in forming a business which then organizes, organizes, faces risks and improves the business that has been formed. Factors that influence interest in entrepreneurship according to the research results of Yasmin et al. (2017) include attitude and

behavior variables (attitude), subjective norms and self-control. Other factors include income expectations (Afrizal et al., 2018), entrepreneurship education and family environment (Afrizal et al., 2018; Fatimah & Purdianto, 2020; Ranwala, 2016; Periansya, 2018), intrinsic motivation, personality, entrepreneurship programs (Periansya, 2018). Furthermore, Torres et al. stated. (2017) that intention in entrepreneurship is the key to understanding entrepreneurship, namely providing motivation for people to become entrepreneurs, so it can be said that a strong intention to become an entrepreneur plays a role in generating entrepreneurial motivation.

The high entrepreneurial interest of Biology Education students at UIN SYAHADA Padangsidimpuan is influenced by entrepreneurship courses and several other courses that are integrated with entrepreneurship education such as biotechnology, microbiology, urban farming, plant development, animal development, anatomy and physiology of the human body, invertebrates. Broadly speaking, the interest in entrepreneurship is due to knowledge of the importance of entrepreneurship, this continues to an activity that will be carried out (Subagio, 2022). The role of lecturers is very significant in providing entrepreneurship courses for Biology Education study program students. Yosada's research (2023), shows that having entrepreneurship courses in universities can foster entrepreneurship by instilling knowledge and interest in entrepreneurship, growing self-confidence and skills in entrepreneurship, increasing motivation to become young entrepreneurs.

The entrepreneurial interest profile can be elaborated from student responses, namely students admit that they are confident in choosing entrepreneurship rather than working for someone else, choose a career as an entrepreneur, and believe that entrepreneurship has a good future orientation. The student's entrepreneurial interest profile can be influenced by many factors, but the initial construction is formed from the knowledge and insight that students have in the field of entrepreneurship (Muliadi et al., 2021). Knowledge in the field of entrepreneurship can be obtained from various sources such as learning and daily experience. Entrepreneurship is not only an innate talent from birth or through field experience alone, but can also be learned and taught (Hayati, 2021; Imran et al., 2021). Thus, the entrepreneurial interest of Biology Education students in the good category is very possible because of the impact of entrepreneurial learning and its integration with study program subjects. Fatimah & Purdianto (2020), through the results of their research, stated that there is an influence between entrepreneurship education and interest in entrepreneurship. Someone who takes

entrepreneurship education will understand the benefits of being an entrepreneur and will be increasingly interested in becoming an entrepreneur.

Self Efficacy

Based on the Kruskal Wallis statistical test, the results obtained were Sig 0.007 > 0.05, which means there is a significant difference between the self-efficacy of students in semesters III, V, and VII. V and III semester students are not yet confident in creating their own jobs. They feel unable to see business opportunities, less able to make plans, less confident about starting a business due to capital constraints, less able to manage the business, difficulty in leading other people, and work networks that are not yet extensive. This is due to students' lack of knowledge and skills in entrepreneurship. VII semester students already have self-confidence in starting a business, as evidenced by 83.3% of students admitting that they would have the courage to open a business after graduating from college if they had not yet found work as educators. This is because biotechnology courses have been integrated with entrepreneurship education up to the marketing stage. Mental maturity also influences this.

Table 4. Kruskal Wallis Test Results Regarding Self-Efficacy

	Ranks			**Test Statistics**	
	Semester	**N**	**Mean Rank**		**Perception**
Perception	Semester VII	18	52.00	Chi-Square	10,039
	Semester V	20	35.45	df	2
	Semester III	39	34.82	Asymp. Sig.	,007
	Total	77			

The self-confidence of UIN SYAHADA Padangsidimpuan Biology Education students in entrepreneurship is classified as moderate, namely only 50.6% feel confident. If we look in more detail based on semester, as many as 83.3% of semester VII students feel confident in entrepreneurship and the rest are still unsure. Only 40% of fifth semester students are confident, 55% are unsure, and 5% are not confident. Not much different from semester V, semester III students were 41.1% confident, 48.7% were unsure, and 10.2% were not confident.

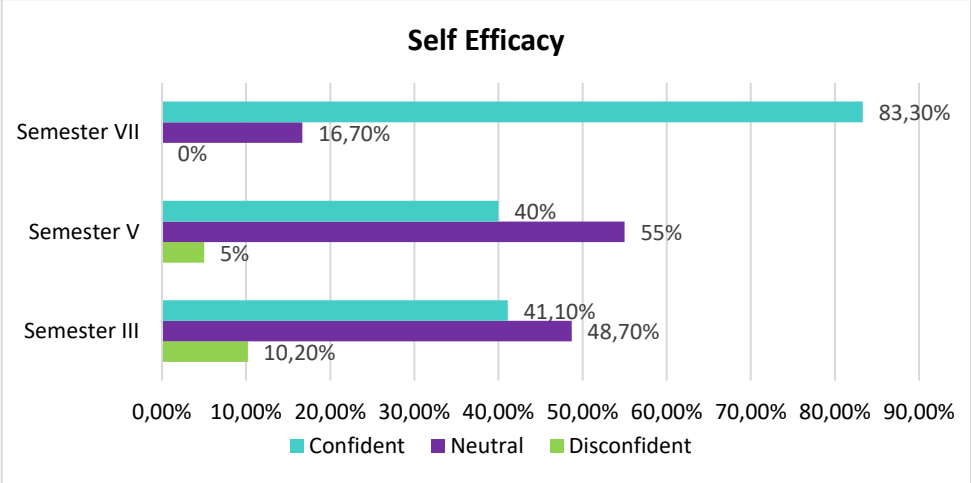

Figure 4. Student Self-Efficacy Diagram

There are two ways to instill an entrepreneurial mentality in students, namely integrating entrepreneurship education into the curriculum and organizing systematic and targeted extracurricular activities to build students' motivation and entrepreneurial mental attitude. for example, entrepreneurship education is implemented into Biotechnology courses through biotechnopreneurship learning. By learning biotechnopreneurship, students are expected to have high self-confidence in entrepreneurship. Mirawati's (2022) research results explain that entrepreneurship education has a positive impact on students' self-efficacy in entrepreneurship, because this factor can strengthen students' knowledge and self-confidence about entrepreneurship. The positive impact proves the strategic role of learning in entrepreneurship education courses in developing entrepreneurial knowledge for students, so that it will give rise to self-confidence to pursue entrepreneurial activities (Yamin, 2023; Ruwaidah et al, 2022; Muliadi et al., 2021). According to the research results of Santi et al. (2017), explained that there is a positive influence of entrepreneurship education on entrepreneurial beliefs and intentions. Self-efficacy and entrepreneurial attitude are planned decisions, so they can be developed through entrepreneurship education.

According to Bandura in Mustofa (2014), self-efficacy and attitudes are influenced by the experience of mastering something (master experience) and vicarious experience. Biology education students' direct experience in mastering entrepreneurship is the most influential

factor in strengthening students' self-efficacy (self-confidence) and entrepreneurial attitudes (Pamungkas, 2017). This means that direct experience in learning interaction activities and practicums in entrepreneurship education is effective in developing students' self-efficacy and entrepreneurial attitudes. Vicarious experience is student experience gained from other people who exemplify successful entrepreneurship which will increase self-efficacy (Pamungkas, 2017). This means that the experience of people around them in entrepreneurship (subjective norms) increases students' self-efficacy in entrepreneurship. Therefore, student experience gained through entrepreneurship education and subjective norms will strengthen students' self-efficacy in entrepreneurship (Putri et al, 2022; Widayoko, 2016).

CONCLUSION

The results of the study show that: 1) student perceptions regarding the integration of entrepreneurship education are very positive, as many as 83.1% of students feel that integration needs to be implemented. Based on the Sig value (0.86 > 0.05), there is no significant difference between the perceptions of semester III, V, and VII students; 2) Students' entrepreneurial interest is relatively high, namely 77.9% of students are interested in entrepreneurship. Based on the Sig value (0.43 > 0.05), there is no significant difference between the interests of semester III, V and VII students; 3) Student self-efficacy in entrepreneurship is classified as moderate, namely only 50.6% of students believe in their abilities. Based on the Sig value (0.07 > 0.05), there is a significant difference between the self-efficacy of students in semesters III, V, and VII.

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