

# Differences in Biology Students' Perceptions of Self-Efficacy in the Field Entrepreneurship

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**Abstract.** This study aims to determine biology students' perceptions of self-efficacy in the field of entrepreneurship. This study is an exploratory research with research subjects of 35 biology education students. The research instrument used was a closed questionnaire with graded answers according to a Likert scale that had been validated by experts and declared valid. The research data analysis used was descriptive statistics and inferential statistics with the Anova test at a significance level of 5%. The results of the study show that (1) students' perceptions of self-efficacy in the field of entrepreneurship have an average student answer score for semester IV of 3,09 in the Good category, semester VI of 3,12 in the Good category, and semester VIII of 3,15 in the Good category; (2) there is no significant difference in the perception of biology students in semesters IV, VI, VIII regarding self-efficacy in the field of entrepreneurship as evidenced by a significance value of 0,959 which is greater than the alpha test value of 0,05 (>0,05).

Keywords: perception, self-efficacy, entrepreneurship

#### INTRODUCTION

The 21st century is characterized by the advent of the Fourth Industrial Revolution, transforming it into an age of openness and globalization (Mardhiyah et al, 2021). This era brings about intensified competition in the workforce, as digital technology, machines, and robots gradually replace numerous occupational roles (Agustiani, Ramdhan & Suhendar, 2022). Despite this, human roles remain irreplaceable, as machines operate optimally when guided and overseen by humans (Cropley, 2020). Consequently, there is a pressing need to enhance the quality of human resources. This was emphasized by Mardhiyah et al (2021) that society's life



in the 21st century is experiencing many changes and requires quality human resources in all efforts and work results. Recognized as the knowledge age, the 21st century demands knowledge-based approaches to meet diverse living needs in various contexts.

Normawati & Margono (2016) elucidated that the demands on human resources in the 21st century necessitate qualities such as creativity, innovation, competitiveness, and independence. These individuals are expected to possess the essential 21st-century skills, namely: Critical Thinking, Creativity, Collaboration, and Communication (Afwan, Suryani & Ardianto, 2020; Maulidah, 2019). Consequently, concerted and systematic efforts are imperative to cultivate high-caliber human resources, with a focus on life skills-oriented education (Wahyuni & Hidayati, 2017). Ariyansyah (2018) further underscored that education plays a pivotal role in ensuring that students acquire learning and innovation skills, proficiency in utilizing technology and information media, and the ability to navigate life effectively for success and resilience in the 21st century.

The promotion of life skills-oriented education is crucial for fostering students' knowledge, skills, character development, and a sense of responsibility, thereby motivating them to attain optimal achievements (Rina & Kamila, 2020). Sudarsana (2017) emphasizes the significance of structured and systematic development of life skills to cultivate self-help behavior, providing students with valuable tools for post-graduation endeavors (Noor, 2015). Hence, a structured approach to life skills development through entrepreneurship education in higher education becomes imperative (Muliadi, Sarjan & Rokhmat, 2022).

Empowering students with competencies in entrepreneurship emerges as a tangible solution, enabling them to graduate as creative, competitive, and independent individuals (Mirawati, Wardana, & Sukaatmadja, 2016), thereby contributing to a reduction in unemployment rates and positively impacting the nation's economy (Listyawati, 2017). Given the ongoing challenges in Indonesia, characterized by high unemployment rates and unresolved disruptions (Muliadi & Mirawati, 2020), entrepreneurship education assumes even greater importance. Notably, as of February 2022, the Central Statistics Agency reported an open unemployment rate of 5.83% among the workingage population in Indonesia, with 14% of them being college graduates.

Acquiring entrepreneurship skills is crucial for students to mitigate unemployment issues (Munawar & Supriatna, 2018). The cultivation of these

skills should be systematic and consistent (Muliadi, Sarjan & Rokhmat, 2022; Muliadi & Mirawati, 2020), given the pivotal role entrepreneurship plays in both students' future prospects and the economic development of Indonesia (Wardhani, Riani & Susilaningsih, 2018; Paramita, 2017). Afwan, Vahlia & Sholiha (2022) posit that fostering entrepreneurs capable of innovation and global competitiveness contributes to economic growth.

The government has actively endorsed this perspective through the National Entrepreneurship Movement, launched in February 2011 to inspire active entrepreneurship, particularly among the younger generation (Setyawan, 2016; Mirawati, Wardana & Sukaatmadja, 2016). Recognizing the significance of entrepreneurship, universities have incorporated entrepreneurship education into their curricula, ensuring that graduates possess the necessary skills and self-efficacy for entrepreneurship pursuits (Primandaru, 2017; Darmawan & Warmika, 2016). At the Mandalika University of Education, the Biology Education Study Program has integrated entrepreneurship education as a mandatory course, aiming to enhance student competencies in entrepreneurship. The goal is to empower biology students with the knowledge and confidence (self-efficacy) to embark on entrepreneurship endeavors (Wardhani, Riani & Susilaningsih, 2018).

Entrepreneurship education plays a pivotal role in systematically enhancing students' self-efficacy within the entrepreneurship domain (Muliadi, Mirawati & Prayogi, 2021). Contrary to the misconception that entrepreneurship competence is solely an inherent trait or a result of practical experience, it can be acquired and imparted through intentional learning efforts (Suryana, 2011). Dewi (2016) emphasizes the significance of entrepreneurship learning in fortifying both knowledge and skills, ultimately fostering students' self-efficacy in entrepreneurship (Dewi, 2016; Hattab, 2014). Indrawati, Herkulana & Syharud (2017) assert that student self-efficacy in entrepreneurship is shaped by knowledge and attitudes, reflecting positive or negative beliefs in entrepreneurship behavior. This assertion aligns with Srigustini (2014) findings, suggesting that fostering and developing student self-efficacy in entrepreneurship should commence early in the educational journey, spanning campus, familial, and environmental influences (Muliadi & Mirawati, 2020).

According to the Theory of Planned Behavior (TPB) explains that self-efficacy is a perceived behavior control variable, namely as a form of student self-confidence to become an entrepreneur from an internal perspective (Santi, Hamzah & Rahmawati, 2017). Wilson (2007) emphasized that students' self-

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efficacy to pursue a field entrepreneurship is a deliberate decision and can be planned, one of which is through entrepreneurship learning. According to Suhirman & Muliadi (2023), a student's semester level influences their knowledge and experience in pursuing education, so that they can determine their self-efficacy in entrepreneurship. This is in accordance with the opinion of Jabali, Supriyono & Nugraheni (2020) that a student's semester level is one of the personal environmental factors in determining student self-efficacy and attitudes. Thus, an exploratory study is needed to determine student self-efficacy in the field of entrepreneurship in terms of semester level.

# **METHOD**

This study adopts an ex post facto research design employing an exploratory descriptive approach (Muliadi & Mirawati, 2020; Muliadi, 2020a) to delineate biology students' perceptions of self-efficacy in entrepreneurship based on their semester level. The ex post facto methodology is chosen to investigate cause-and-effect relationships without direct manipulation or intervention by the researcher, relying solely on the documentation of data from past activities (Sugiyono, 2017; Arikunto, 2016; Singarimbun & Sofyan, 2009). The participants in this study consist of 35 biology education students from the Faculty of Science, Engineering, and Applied Sciences at Mandalika Education University. The convenience sampling technique is employed, considering the accessibility and willingness of respondents to participate in an online questionnaire (Fink, 2011).

The utilized research tool was a closed questionnaire featuring nuanced attitude responses on a Likert scale, as outlined by Muliadi (2020b) and administered through the Google Form platform (Adha et al, 2020). This instrument was meticulously crafted, drawing upon indicators associated with student perceptions of self-efficacy within the entrepreneurship domain. The questionnaire, comprised of seven statements, was fashioned by incorporating elements from the instruments developed by Perwitasari (2017) and Muliadi & Mirawati (2020). Rigorous validation procedures involving experts were undertaken, affirming the questionnaire's validity.

Research data was analyzed using quantitative descriptive and inferential statistics. Quantitative descriptive analysis was used to describe biology students' perception data regarding self-efficacy in the field of entrepreneurship in terms of semester level. To interpret student self-efficacy data, the assessment criteria developed by Muliadi (2020b) are used as presented in Table 1.

 Average score ( $\bar{p}$ )
 Interpretation

 3,51-4,00 Excellent

 2,51-3,50 Good

 1,51-2,50 Fair

 1,00-1,50 Less

**Table 1.** Criteria for interpreting student perceptions

Inferential statistical analysis was used to determine differences in biology students' self-efficacy in the field of entrepreneurship based on semester level, analyzed using the Anova (Analysis of Variance) test at a significance level of 5% with the formulation of a statistical hypothesis, namely  $H_0: \mu 1 = \mu 2$  (there is no significant difference in self-efficacy students in semesters IV, VI, VIII in the field of entrepreneurship) and  $H_1: \mu 1 \neq \mu 2$  (there is a significant difference in the self-efficacy of students in semesters IV, VI, VIII in the field of entrepreneurship). If the analysis results are significant or p-value t-test and test Anova is smaller than 0.05, then  $H_0$  is rejected and  $H_1$  is accepted or vice versa.

# RESULTS AND DISCUSSION

Research data was analyzed using descriptive statistics and inferential statistics. A description of biology students' perception data regarding self-efficacy in the field of entrepreneurship based on semester level is presented in Table 2 below.

**Table 2.** Data on student perceptions regarding self-efficacy in the field of entrepreneurship

Variable		N	N Σ Score		Category	
Semester	IV	5	15,43	3,09	Good	
	VI	17	53,00	3,12	Good	
	VIII	13	41,00	3,15	Good	

Based on Table 2, it is known that the average perception score of biology students regarding self-efficacy in the field of entrepreneurship, namely students in semester IV is 3,09 in the Good category, semester VI is 3,12 in the Good category, and semester VIII is 3,15 in the category Good. The data description is emphasized in the following Figure 1 presentation.

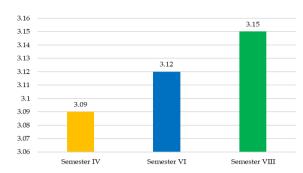


Figure 1. Average student perception data regarding self-efficacy

Inferential statistical analysis using the Anova test to determine differences in biology students' perceptions of self-efficacy in the field of entrepreneurship based on semester level, but first a prerequisite test, namely the normality and homogeneity test, was carried out. The results of the homogeneity test (Levenes test) and normality (Kolmogorov-Smirnov's test) are shown in Table 3 below.

Table 3. Homogeneity and normality test results

	Homogeneity	7	Normality		
N	Levenes Statistics	C: ~	Kolmogorov-Smirnov's	C: ~	
	test scores	Sig.	test scores	Sig.	
35	0,052	0,949	0,544	0,929	

The results of the homogeneity test (Levenes test) and normality (Kolmogorov-Smirnov's test) show significance values of 0,949 and 0,929 respectively, both of which are greater than the test alpha value of 0,05, so it is concluded that the data variance is homogeneous and normally distributed. Next, the Anova test was carried out with the analysis results as presented in table 4 below.

**Table 4.** Anova test results

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	0,020	2	0,010	0,041	0,959
Within Groups	7,575	32	0,237		
Total	7,595	34			

Based on the results of the Anova test in table 4, it shows that the significance value of 0,959 is greater than the alpha test value of 0,05 (>0,05), so that H<sub>1</sub> is rejected and H<sub>0</sub> is accepted, which means that there is no significant difference in the perceptions of students in semesters IV, VI, VIII about self-efficacy in the field of entrepreneurship.

The outcomes of this study elucidate the following points: (1) Biology education students in semesters IV, VI, and VIII exhibit a Good-level of self-efficacy (confidence) in entrepreneurship; (2) There is no statistically

significant difference in the self-efficacy of students across semesters IV, VI, and VIII in the entrepreneurship domain. The research findings indicate a notably high level of confidence among both male and female biology education students to engage in entrepreneurship. These results underscore that students in semesters IV, VI, and VIII possess substantial knowledge about entrepreneurship, contributing to their self-efficacy in the field. However, an examination of the average perception scores reveals that students in semester VIII surpass their counterparts in semesters IV and VI, suggesting an incremental improvement in self-efficacy with higher semester levels. This aligns with the research findings of Suhirman & Muliadi (2023), highlighting the influence of a student's semester level on their knowledge and experience, influencing self-efficacy in entrepreneurship. Jabali, Supriyono & Nugraheni (2020) underscored that a student's semester level is a significant personal environmental factor shaping self-efficacy and attitudes in entrepreneurship.

This study elucidates that students majoring in biology education exhibit commendable knowledge and experience in entrepreneurship, contributing to a positive self-efficacy perception in the entrepreneurship realm. The sources of students' entrepreneurship-related knowledge and experience encompass diverse channels such as formal education, family dynamics, and everyday encounters (Muliadi, 2020b). Srigustini (2014) underscores the notion that students' entrepreneurship knowledge can be nurtured from early stages through formal learning, familial influence, and environmental exposure. Entrepreneurship education emerges as a pivotal factor, positively impacting students' confidence and aspirations in the entrepreneurship domain (Santi, Hamzah & Rahmawati, 2017). Findings from Turker & Selcuk (2009) affirm that entrepreneurship education exerts a positive influence on students' confidence to pursue entrepreneurship ventures. Wilson (2007) underscores that belief in entrepreneurship is a conscious decision and can be methodically cultivated through entrepreneurship education. Notably, the research outcomes of Muliadi, Mirawati & Prayogi (2021) validate that students' entrepreneurship confidence is significantly influenced, to the extent of 42.3%, by factors related to entrepreneurship education and subjective norms.

Entrepreneurship learning emerges as a crucial catalyst in shaping students' comprehension, skills, beliefs, and attitudes towards entrepreneurship (Fiet, 2001; Kourilsky & Walstad, 1998). Dewi (2016) asserts that entrepreneurship learning can activate intrinsic factors within students, instilling confidence in entrepreneurship (Muliadi, 2019; Antoncic & Hisrich, 2003). This notion is

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underscored by Suryana (2011) assertion that entrepreneurship is not solely an inherent trait but can be cultivated through education; it is not just a talent or a result of field experience but can be acquired through intentional learning and teaching. Consequently, aspiring entrepreneurs among student teachers can harness their potential by actively learning and developing it to seize opportunities, realizing their entrepreneurship dreams (Dewi, 2016). This perspective aligns with the Theory of Planned Behavior (TPB), which posits that self-efficacy serves as a perceived behavior control variable, reflecting an individual's internal confidence in becoming an entrepreneur (Santi, Hamzah & Rahmawati, 2017). Furthermore, self-efficacy precedes entrepreneurship interest, as highlighted by Santoso & Handoyo (2019). In essence, students' knowledge about entrepreneurship serves as a cornerstone in fortifying their self-efficacy, forming a vital connection in the entrepreneurship learning journey.

#### CONCLUSION

Based on the results of the research and discussion above, it can be concluded that (1) students' perceptions of self-efficacy in the field of entrepreneurship have an average student answer score for semester IV of 3,09 in the Good category, semester VI of 3,12 in the Good category, and semester VIII of 3,15 in the Good category; (2) there is no significant difference in the perception of semester IV, VI, VIII students regarding self-efficacy in the field of entrepreneurship as evidenced by a significance value of 0,959 which is greater than the alpha test value of 0,05 (>0,05).

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