



The Correlation between Self Efficacy with Problem Solving Ability of Student in Studying Ecosystem

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Article Information	ABSTRAK
Submit: 01 – 01 – 2023 Received: 14 – 04 – 2023 Published: 11 – 05 – 2023	<p>Siswa membutuhkan kemampuan untuk mengeksplorasi, berpikir kritis dan menganalisis suatu masalah untuk mendapatkan solusi yang logis dan tepat. Kemampuan pemecahan masalah yang disertai dengan keyakinan akan kemampuannya (<i>self efficacy</i>) akan memaksimalkan kemampuan siswa dalam dan mendapatkan nilai yang maksimal. Penelitian ini bertujuan untuk menganalisis hubungan <i>self efficacy</i> dengan kemampuan pemecahan masalah siswa pada materi ekosistem. Metode yang digunakan adalah metode kuantitatif dengan pendekatan korelasional (studi hubungan). Teknik pengumpulan data berupa tes kemampuan pemecahan masalah berupa esai tentang ekosistem dan angket <i>self efficacy</i>. Teknik analisis data menggunakan uji korelasi Product Moment. Berdasarkan hasil analisis data dan pengujian hipotesis diperoleh nilai koefisien korelasi sebesar 0,675 yang berarti tingkat koefisien korelasinya kuat. Dapat disimpulkan bahwa terdapat hubungan <i>self efficacy</i> dengan kemampuan pemecahan masalah siswa pada materi ekosistem dengan koefisien korelasi yang kuat.</p> <p>Kata kunci: ekosistem; keterampilan pemecahan masalah; <i>self efficacy</i>;</p>
Publisher	ABSTRACT
Program Studi Pendidikan Biologi, Fakultas Sains dan Teknologi, UIN Walisongo Semarang	<p><i>Students need the ability to explore, think critically and analyze a problem for a logical and appropriate solution. Problem solving abilities accompanied with a belief in their abilities (self efficacy) will maximize student abilities in and get maximum grades. This research aims to analyze the correlation between self efficacy and students' problem-solving abilities in ecosystem material. The method used is a quantitative method with a correlational approach (relationship study). The data collection technique was in the form of a problem-solving ability test in the form of an essay about ecosystem and a self efficacy questionnaire. The data analysis technique uses the Product Moment correlation test. Based on the results of data analysis and hypothesis testing, a correlation coefficient value of 0.675 was obtained, which means that the correlation coefficient level is strong. It can be concluded that there is a correlation between self efficacy and problem-solving abilities of students in ecosystem material with a strong correlation coefficient.</i></p> <p>Keywords: ecosystem; problem solving abilities, self efficacy</p>

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INTRODUCTION

The 21st century learning paradigm emphasizes the ability of students to find solutions from various sources, formulate problems, think analytically and collaborate and collaborate in solving problems. (Abidin, et.al in Fajariningtyas & Hidayat, 2022). Learning can be done by giving real, direct, and relevant problems to the needs of these students, so that students can obtain relevant information for each particular problem in a lesson which can provide opportunities for students to carry out simple explorations so that they don't just accept and memorize (Usha Adiga and Sachidananda Adiga, 2015).

Problem solving abilities need to be possessed by students to meet learning demands and get satisfactory grades. Problem solving ability can be defined as the ability to carry out the process of recognizing and eliminating the gap between reality and the ideal state of a phenomenon or matters related to biology subject matter (Zahra, Gresinta, & Pratiwi, 2021). Problem solving abilities need to be trained so that students become skilled in solving every problem (Kusumaningtyas, et.al in Topano & Walid, 2021).

In addition to problem solving ability which is one of the cognitive aspects, affective aspects also need attention in learning. One of the affective abilities that can be developed is self efficacy or belief in students. (Sunaryo, 2017 in Shofiana & Melisa, 2022). Self efficacy related to a person's belief in his abilities so that he is able to complete the work and tasks he carries. Individual thoughts on self efficacy will determine how much effort will be expended and how long individuals will persist in facing obstacles or unpleasant experiences during the learning process (Silvia & Miterianifa, 2019).

In the learning process between self efficacy and problem solving skills are needed. Problem solving ability is seen from its usefulness in solving problems and finding solutions to problems in everyday life. Problem solving abilities cannot function properly if there is no belief in carrying out tasks or challenges to a problem. Rahayu, (2019) explains how much encouragement comes from outside, but if a person is unable to develop self-confidence, then the intelligence of their abilities will not be used optimally.

Based on observations and interviews with Biology teachers for class X MIPA at SMAN 5 Tasikmalaya, it shows that students do not have sufficient confidence when given questions or assignments. Students still experience uncertainty about completing assignments properly and on time in all conditions. The author assumes if self efficacy students are still in the low category.

The ability to solve problems in learning biology is also not optimal. Giving assignments or questions, students are not used to using problem-based questions. Teachers in conveying biology lessons have not been optimal in linking the concepts learned with phenomena that occur in everyday life. Such a learning process does not provide opportunities for students to develop problem-solving abilities.

The problems used in this study are related to ecosystems. Problems that occur in ecosystems that require students' problem-solving abilities to think analytically, critically, carefully and creatively so that ideas or solutions to problems that occur in the surrounding environment will emerge so that they become a good stimulus for this research. The purpose of this study was to analyze the correlation of self efficacy with students' problem-solving abilities in ecosystem material in class X SMA Negeri 5 Tasikmalaya.

METHODE

The method used is the correlational method, "correlational research is a study to determine the relationship and level of relationship between two variables." (Fraenkel, Wallen, & Hyun, 2012 : 328). Variables consist self efficacy and problem solving abilities.

The research instrument is a questionnaires self efficacy and problem solving ability essays covering ecosystem material. The population in this study was 251 students in class X MIPA at SMA Negeri 5 Tasikmalaya for the 2021/2022 academic year with technical sampling purposive sampling with the class criteria that have the highest average daily test scores in the form of 60 students from class X MIPA 5 and X MIPA 6 SMA Negeri 5 Tasikmalaya.

Retrieval of instrument data is taken with assistance google forms and the question sheet given after studying ecosystem biology material. Data analysis techniques include prerequisite tests, namely normality and linearity tests which were carried out before the hypothesis, namely using a correlation test bivariate.

RESULT AND DISCUSSION

The data analyzed was in the form of a questionnaire self efficacy and the results of problem-solving abilities. The results of the correlation regression analysis using SPSS 26 for windows can be seen in Table 1.

Table 1. Summary of Bivariate Correlation Regression Results

<i>Model summary</i>								
<i>R</i>	<i>R Square</i>	<i>Adjusted R Square</i>	<i>Std. Error of the Estimate</i>	<i>Change Statistics</i>				
				<i>R Square Change</i>	<i>F Change</i>	<i>df1</i>	<i>df2</i>	<i>Sig. F Change</i>
0,675 ^a	0,455	0,446	4,945	0,455	48,501	1	58	,000

Based on the values listed in table 1, it is known that the significance value obtained is 0.000, which means Ho rejected means there is a correlation self efficacy with the problem solving abilities of students on ecosystem material in class X SMA Negeri 5 Tasikmalaya City. with a correlation coefficient (R) of 0.675. For the value of the coefficient of determination (R²) of 0.455 or 45.5%. So it can be concluded that

variable self efficacy contributed 45.5% while the remaining 54.5% were other variables not examined in this study.

Table 2. Correlation Coefficient Criteria

Coefficient Interval	Correlation Level
0,00–0,199	Very Low
0,20–0,399	Low
0,40–0,599	Moderate
0,60–0,799	Strong
0,80–,000	Very Strong

(Source: Sugiyono, 2013)

Based on table 2 it is known that the relationship between self efficacy with problem solving abilities in a strong category and the contributions from self-efficacy to students' problem-solving abilities indicates the role of self efficacy to the problem solving abilities of students who have self efficacy enough will be able to overcome all problems properly, especially in biology subjects.

Various studies that have been done previously showed a relationship between self efficacy with students' problem solving abilities. Jatisunda, (2017) in his research explained that self efficacy contribute to problem-solving abilities. This is proven by the correlation test between variables self efficacy and mathematical problem solving abilities. The coefficient shows a result of 0.675 which means the relationship between variables is positive and strong. In line with that (Fauziana, 2022) has also shown in his research that there is a significant influence from self efficacy on the ability to solve science problems in students. According to the results of research by Pimta et al, (2009) students' problem solving abilities have many influencing factors and one of them is self efficacy. It also proves that self efficacy contributes significantly to problem solving abilities

Problem solving abilities are closely related to students' beliefs in solving problem solving questions (Utami & Wutsqa, 2017). Student with high self efficacy will have high belief with his ability to solve problems in the learning process. According to Isni, et.al (in Fauziana, 2022), someone who has self efficacy believe that in order for them to achieve their goals, they must work intensively and persevere when they encounter difficulties.

Table 3. Average Score Assessment Categories

Percentage (%)	Category
80–100	Very High
61–80	High
41– 60	Moderate
21–40	Low
0–20	Very Low

(Source: Yolanda, (2019), Utami & Wutsqa, (2017))

Self efficacy measured by giving a questionnaire to students with 30 statement items. Self efficacy based on Bandura 1997 (in Malinen et al., 2013) consists of 3 dimensions or indicators namely magnitudes, strgeht and generality.

Table 4. Indicator Percentage Self Efficacy

Indicator	Percentage (%)	Category
<i>Magnitude</i>	64,16	High
<i>Streght</i>	61,16	High
<i>Generality</i>	58,66	Moderate

Based on table 4 indicators magnitudes having the highest average score of the other indicators, students are able to overcome their learning difficulties by having a positive view of the task, having confidence in their abilities to overcome obstacles in the difficulty level of the problem. In line with Merlis, (2017) explained that students who are confident they can overcome obstacles at a low level of difficulty and successfully pass them, will be more confident in overcoming obstacles at a higher level of difficulty.

Low average score self efficacy students on indicators generality, students feel they have not mastered the problem with the time allotted. Students are quite pessimistic when working on difficult questions so they ask their friends for help in solving some problems. Merlis, (2017) in his research, on aspects generality students must have self efficacy in completing assignments even though the situation faced by students is not supportive, such as limited time, class situations and class facilities.

Problem solving abilities are measured by essay questions based on indicators by Johnson and Johnson (in Tawil & Liliasari, 2013), namely, defining problems, diagnosing problems, formulating alternative strategies, implementing selected strategies and evaluating processes and results.

Table 5. Percentage of Problem Solving Ability Indicators

No	Indicator	Percentage (%)	Category
1	Define The problem	88	Very High
2	Diagnose the problem	85	Very High
3	Formulate alternatif strategy	82	Very High
4	Implement alternative strategy	80	High
5	Procces and Outcome Evaluate	60	Medium

Based on table 5, the 1st indicator (defining the problem) has the highest percentage value of the other indicators, namely 88%. Students have been able to find the main issues of the events given and formulate the main issues in the form of questions. Understanding of problems and knowledge of ecosystem materials. In line with Azhari, (2021), which is also shows the highest score of students' problem solving abilities on the problem diagnosing indicator. Students on this indicator are required to understand the problems given so as to be able to solve problems. Polya

(in Syaharudin, 2016) explains that "The first stage in solving a problem is understanding the problem itself."

On the 5th indicator (Process and Outcome Evaluate) obtain a percentage with a low score. Students are required to consider carefully which strategy is most appropriate and logical for solving a problem and to think about the positive and negative consequences of the solution. Indriyanti, et.al, (2019) explains the low achievement of results in this aspect because there are still many students who do not review the answers that have been made. The skills of students in conducting an assessment of a case include the abilities needed in the learning process. This ability can be trained by getting used to thinking analytically and critically (Sigit, Heryanti, Pangestika, & Ichsan, 2019).

The difference in the average value per indicator shows that when students are faced with questions in the form of actual problems, students are less able to analyze the problems presented. The impact is that the solution to the given problem is illogical and cannot be applied in everyday life (Amanda, et.al, 2021). In addition, in problem solving activities, the first thing students do in solving problems is writing down important points so that with limited time students are not optimal in carrying out the last indicator, namely evaluating the success of the strategy.

CONCLUSION AND RECOMENDATION

Based on the results of relationship research self-efficacy with problem-solving skills in ecosystem material at SMA Negeri 5 Tasikmalaya it can be concluded that it has a positive relationship with the category of interrelationships self efficacy and the ability to solve problems on ecosystem material is included in the strong category. The amount of contribution made self efficacy to the problem solving abilities of students on ecosystem material, namely 45.5%. The higher it is self-efficacy possessed by students, the ability to solve problems will also be high in themselves.

This research still needs further research to find out other factors that influence problem solving abilities. With this research it is hoped that it will be a means to improve the quality of learning for schools, teachers and become a provision for students to increase their belief and abilities in order to get maximum results.

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