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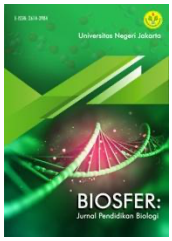

The relationship between self-efficacy with environmental literacy based on students' academic level

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ABSTRACT

The aim of the research is to find out the relationship between environmental literation and self-efficacy based on students' academic level of the 10th grade of SMA Negeri 1 Limbangan on the learning material of ecosystem. Correlational study became the core of the research. The research was conducted in March 2024. The type of the research is correlational with the sample of 192 students, sampled using the purposive sampling technique, proved by average score of daily test. Data collection technique using a non-test instrument in form of self-efficacy questionnaire as well as an environmental literacy essay test. Research instrument used is a self-efficacy questionnaire consists of 10 statements to measure environmental literacy covering 25 questions. Data analysis using product moment correlation. The result obtained correlation coefficient between self-efficacy with environmental literacy showed the value of 0.616, ranged between 0.60 and 0.799, enough to show the strong correlation between both variables. The result of the research showed that there is a strong relationship between academic level with environmental literacy with the correlation coefficient as high as 0.40 – 0.599. The analysis concluded that there is a positive relationship between self-efficacy and environmental literacy based on the academic level.

INTRODUCTION

In the 21st century, Indonesian education is faced with several challenges and opportunities that are different from the previous education era. One indicator of a successful education process can be seen in the students' learning achievement. Cognitive learning achievement is a learning achievement that is related to the changes gained in the form of knowledge at the end of the learning process (Elitasari, 2022) (Yunita, L., & Mandasari, 2022). Students' learning achievement is affected by several factors, i.e. external and internal. External factors that affect students' learning include family, school, as well as society. Meanwhile, the internal factors include the physical and psychological factors related to intelligence, interest, motivation, attitude, physical condition, mental health, self-efficacy, self-confidence, and metacognitive skills, as well as other internal factors. In the subject of biology, students can initiate their literacy activity by identifying and analyzing environmental problems, evaluating solutions, planning actions to solve environmental problems, as well as developing scientific knowledge and learning basic ecology. (Susilowati, Wilujeng, & Hastuti, 2018)

Environmental literacy is important to be developed as an effort to make society aware and competent to conduct scientific performance as well as finding solutions to environmental problems (Bonnet,t 2010). Environmental literacy also plays an important role in forming individual attitudes towards sustainability, as well as an understanding of how to encourage a sustainable environment related to economic, ecological, and social justice (de Brito Miranda, Jófili, dan dos Anjos Carneiro-Leão, 2017). Developing environmental literacy has numerous benefits, one of which is to reduce students' dependence on electronic gadgets. This also increases their awareness, knowledge, as well as their environmental attitude (Attamimi et al., 2021). Awareness of environmental literacy will have a positive impact on the environment, which is the emergence of ideas and solutions to solve problems such as environmental pollution (Goldman et al., 2018). Good environmental literacy may encourage students' self-efficacy by increasing their self-confidence in understanding, analyzing, as well as taking action regarding environmental issues so that they will be more confident in contributing to ecosystem sustainability.

Self-efficacy is an important component in the success of accomplishing learning activities. As students believe in their competence, it is most likely that they are able to achieve their maximum potential (Rustika, 2016). Students are having more ability to cope with their fear of failure, as well as being able to develop the skills needed when they have a strong belief (Schwarzer dan Warner, 2013). This is supported by the statement of Roche et al. (2020) that students' motivation, learning capacity, and academic performance are affected by their self-efficacy. Rahayu (2019) found that IQ is not the determining factor of how good students are in their learning activities. According to Fida (2023), believing in self-efficacy is important in developing extraordinary intelligence and creativity. Since self-efficacy covers motivation, ambition, efforts, and self-confidence of being development, it can contribute to maximizing intelligence. In line with the modern development of education, understanding and implementation of self-efficacy is expected to be able to strengthen the learning quality at an academic level, as well as students' character formation in coping with the complexity of future challenges.

Academic level is the evidence of advancement and even achievement reached by the student as a statement of success or failure of an education program. According to (Winkel, 1989; Chaplin, 2001; Sobur, 2006), academic level is defined as the learning results, such as understanding, implementation, analysis, and evaluation in a particular period that is directly evaluated by the teacher. (Djiwandono, 2002) stated that the function of academic level assessment is to determine the level of students' readiness to accomplish a particular education level, determine whether students are mature enough to advance to the higher education level, as well as compare whether students' achievements are by their capacity or not. Therefore, some problems emerged: (1) the relationship between self-efficacy and environmental literacy; (2) the relationship between academic level and environmental literacy; (3) the relationship between self-efficacy and academic level towards environmental literacy. Thus, a study on environmental literacy related to self-efficacy and academic level may provide precious insights into how individuals believe in their capacity to understand, evaluate, and participate in environmental issues. The relationship between self-efficacy and environmental literacy towards students' academic level will become the main focal point of the research.

METHODS

Research Design

The research used a quantitative correlational design. The variables consisted of three,, i.e Self-Efficacy (X1), Academic Level (X2), as well as Environmental Literacy as the dependent variable (Y).

Population and Samples

The population of the research was the 10th grade students of SMA Negeri 1 Limbangan, with the total number referred to students' attendance data was 288 students. The sampling technique used was random sampling using the Slovin formula; thus, a sample of 192 students was obtained as a sample. The data collection technique used a test to assess students' cognitive skills regarding environmental literacy, as well as a non-test in the form of questionnaires regarding environmental literacy. consisting of questions that must be answered by the respondents to assess behavior and attitude aspects of environmental literacy, as well as a self-efficacy questionnaire regarding the cognitive aspect.

Instrument

Self-efficacy was measured using a self-efficacy questionnaire adapted from indicators developed by Bandura (1997) i.e, level, strength, and breadth dimensions. Self-confidence is students' belief in their self-capacity, measured by a self-confidence questionnaire adapted according to indicators developed by (Schwarzer, R., Bäßler, J., Kwiatek, P., Schröder, K., & Zhang, 1997) i.e, difficulty, generalization, and strength. The self-efficacy questionnaire was a closed questionnaire using the Likert Scale of 1 to 4. Using 10 questions, some of which were considered positive and others were negative. Items of the self-efficacy questionnaire were translated from English to Bahasa Indonesia as the first step in the adaptation process. Next, the results were translated from Bahasa Indonesia to English to ensure that the meaning remained the same. If both interpretations were congruent, the statements could be used to collect data. Environmental literacy was measured using a test adapted according to indicators from (Liang et al. 2018), i.e., cognitive, attitude, and behavior. Environmental literacy in students' cognitive aspect was measured through 32 multiple-choice questions on a written test (Handayanti, 2020). Environmental literacy on the aspect of attitude and behavior was measured using a closed questionnaire using a Likert Scale from 1 to 4. There were 31 items of attitude measurements and 23 items of behavior measurements in the environmental literacy questionnaire (Liang et al., 2018). Academic levels were measured according to students' reports of the first semester of the 2023/2024 academic year, obtained from the biology teacher. The result of the logic validity test shows that the self-efficacy questionnaire was in a very valid category with a score of 4.62; the environmental literacy questionnaire of attitude and behavior aspects was in a very valid category with a score of 450; and the environmental literacy test was at a very valid category with the score of 4.56.

Procedure

The preliminary stage was started by conducting an observation at school as well as asking for the principal's permission. Then, prepare a research proposal and instruments so that the research is eligible to be presented in a preliminary seminar, as well as instrument validation by expert validators. The implementation stage included distributing questionnaires and collecting students' reports. After the implementation, the next stage was data processing to be examined and analyzed statistically using SPSS version 22 and Microsoft Excel. Whereas, the examination method used in the research was simple correlation.

Data Analysis Techniques

Data on the self-efficacy variable were described using a questionnaire. Maximum, minimum, and standard deviations were used to present the obtained results by determining instruments directly for all categories. There was a minimum value of 10 and a maximum of 30, with a standard deviation of 7.423 and a data distribution range of 30-40 for the self-efficacy variable. The result of a classification of the self-efficacy variable according to the conventional formula of descriptive data processing is presented in Table 1.

Table 1

Categorization of the self-efficacy variable of the 10th-grade students at SMA Negeri 1 Limbangan.

Interval	Category	Frequency	Percentage(%)
1 – 22.912	Low	45.00	23.44
22.913 – 37.776	Moderate	131.00	68.23
> 37.776	High	16.00	8.33
Total		192.00	100.00

According to the result of the data analysis shown in Table 1, the self-efficacy level of the students of SMA Negeri 1 Limbangan is in the moderate category, i.e., 68.23 % of the total students. A

similar result was found in the study by Patibang & Zubair (2020); (Syahroni & Rohmatun, 2022), (Aan Aminah, Teti Sobari, 2021). This indicates that students are not having self-efficacy at the expected level yet. (Margolis & McCabe, 2006) stated that students with moderate self-efficacy levels tend to hesitate in decision-making, put less effort into the learning process, and tend to consider giving up. According to Nugraheni (2018), students with moderate self-efficacy show an attitude of hesitation in answering the teacher's questions, less initiative to learn actively, as well as less capability of completing tasks; moreover, they tend to avoid difficult questions. (Cramer, 1991) stated that students with a moderate self-efficacy level may imply their learning process. Thus, students are expected to develop their self-efficacy by believing that they are able to achieve the best possible result by using their self-efficacy. Descriptively, the academic level of all collected samples was analyzed from categorizing up to finding out the percentage. Score description and interval determination towards frequency distribution are shown in Table 2.

Table 2
Categorization of Academic Level Variable of the 10th-grade students at SMA Negeri 1 Limbangan.

Interval	Category	Frequency	Percentage (%)
1 - 31,125	Low	48.00	25.00
31,126 - 66,451	Moderate	96.00	50.00
>66,451	High	48.00	25.00
Total		192.00	100.00

Table 2 (Risdiyanto, 2021) stated that each student has their own learning needs. By categorizing academic level, teachers can adjust their teaching method in accordance with students' capabilities. For example, students with high academic levels may need bigger challenges to develop their potential to the maximum, while students with low academic levels may need more guidance and support. Based on the data analysis result it can be seen that the academic level of the students at SMA Negeri 1 Limbangan is in the moderate category, which is 50%. This is in accordance with the study by Bahar (2015) that students are not yet achieving a standard academic level. The result of students' scores towards academic level perception will change over time, as shown by (Macqueen, 2013). Students' minds and psychic conditions in the classroom may become the cause of the change. According to Bahar (2025), students with high academic levels are less concerned. Their concern are regarding their capacity to engage in the learning process. Most students with low achievements are feeling concerned since they are not able to keep up with the same level as other students.

According to Adawiyah, (2021) the term smart student is used to describe students with exceptional achievement in school, while the term stupid student is used to describe those who have difficulty in understanding and implementing the learning material in the classroom. It is common for teachers to categorize their students according to their academic scores. The premise that becomes the basis of this categorization is that all students have the same capabilities. Students are usually categorized according to their academic skills or scores. (Adodo S & Agbayewa J, 2011) stated that the result shows that there are many advantages in categorizing students based on their cognitive skills. This includes higher student achievements, easier classroom learning, better control of instructions, as well as ease of control in overall instruction delivery. Teachers who become a good example of high achievement and support students with academic difficulties make them more comfortable among their peers who share the same learning capabilities. (Gamoran, 2001) Acknowledging the fact that making assumptions about students based on their academic level classification may result in bad teaching practices as well as widening the gap between their achievements. Moreover, this may be harmful for students with low capability who are having difficulty expressing their opinions. According to Chisaka (2003), due to their self-confidence in their intelligence, teachers tend to ignore the high-level students. Some of the factors that influence academic performance, according to Suwarsito (2017), are: learning advantage, learning needs, the capacity of conducting learning activity, complacency on the concept of engaging in learning activity, awareness of being engaged in learning activity, as well as satisfaction towards the learning results. Descriptively, the environmental literacy of all collected samples was analyzed, starting from the categorization up to the calculation of the percentage. Score elaboration and interval determination towards frequency distribution are shown in Table 3.

According to data analysis in Table 3, it can be seen that the students' academic level of SMA Negeri 1 Limbangan is in the moderate category, which is 62.50%. A similar result was found in the study by Bahar (2015). This indicates that students are not yet achieving the standard academic level.

According to Thahir (2018), students with moderate academic levels tend to be more stable emotionally compared to those who achieve higher or lower academic levels. Herman et al. (2022) stated that students usually follow the learning activity, yet they do not always show a high level of discipline. They might complete their tasks right on time, yet they do not show more effort than what is needed. According to Wulanningtyas *& Ate (2020), students with moderate academic levels have enough self-confidence, yet they seldom hesitate in their academic skills. They can be quite comfortable in an academic environment, yet they are not always ready to take risks in the learning process. The result of the Multicollinearity test is shown in Table 4.

Table 3
Categorization of Environmental Literacy Variable of the 10th-grade students at SMA Negeri 1 Limbangan.

Interval	Category	Frequency	Percentage (%)
1 - 167,043	Low	35.00	18.23
167,044 - 198,884	Moderate	120.00	62.50
>198,884	High	37.00	19.27
Total		192.00	100.00

Tabel 4
Multicollinearity Test

Variable	Collinearity	Statistic	Information
Self-efficacy	0.923	1.084	Multicollinearity does not occur
Academic Lavel	0.923	1.084	Multicollinearity does not occur

The basis of decision-making is that there are no multicollinearity symptoms if the tolerance value > 0.100 and the VIF value < 10.00. According to Table 4, it can be seen that the tolerance value is > 0.100 and VIF value < 10.00 for all variables, thus relationship deviation between the independent variable and the correlation model did not occur, or, in other terms, the multicollinearity symptom did not occur. Results of the self-efficacy correlation test towards environmental literacy are shown in Table 5.

Table 5
Correlation Test of Self-efficacy towards Students' Environmental Literacy

Model	R	R Square	Adjusted R Square	Sig.
self-efficacy	0.616	0.224	0.221	0.000

Table 5 shows that self-efficacy and environmental literacy are statistically significant, as high as 0,000, according to the result of the product-moment correlation test. Due to the correlation coefficient value (0.000<0.05), Ha is accepted and H0 is rejected. The correlation coefficient shows that self-efficacy and environmental literacy have a weak yet positive relationship. Therefore, regardless of whether the relationship category is strong or weak, environmental literacy skills will be in a high category if students' self-efficacy is high. The correlation coefficient of research data is valued at 0.616 and ranges between 0.60 to 0.799, fairly showing the strong correlation between both variables. This is in accordance with the study by Syabania et al. (2023), Rosdiana, Maknun, & Roviati (2020), which shows a significant relationship between self-efficacy and environmental literacy. The result of the academic level correlation test towards environmental literacy is shown in Table 6.

Table 6
Correlation test of academic level towards students' environmental literacy

Model	R	R Square	Adjusted R Square	Sig.
Level academic	0.537	0.749	0.749	0.000

Table 6 shows that the correlation coefficient value is (0.000<0.05), thus the null hypothesis (H0) is rejected and the alternative hypothesis (Ha) is accepted, and by the result of the product-moment correlation test for academic level data towards environmental literacy. The level of significance is 0.000, indicating that there is a correlation between the academic level and environmental literacy at a strong category, as well as a statistically positive and significant relationship.

This suggests that students with high academic levels will have high environmental literacy skills despite a weak or low relationship with literacy. There is a strong relationship between both variables, with a correlation coefficient of 0.537 and a coefficient range of 0.40 – 0.599, according to the research data. This is because various learning styles can be improved through teaching that focuses on real-world events (Ardianti, Wanabuliandari, & Rahardjo, 2017)

Students with healthy self-confidence tend to have higher self-efficacy as well as high intrinsic motivation. In accordance with the study by Dwijanayanti (2023), which shows that self-efficacy and academic level affect environmental literacy. For example, environmental literacy involves analysis, evaluation, and environmental information application skills related to the academic subject. Self-efficacy and academic level affect students' ability to develop better environmental literacy, such as cognitive, attitude, and behavior related to the environment. According to (Miterianifa dan Mawarni, 2024), high environmental literacy cognitive skills can improve academic level and self-efficacy simultaneously. For example, self-confidence regarding academic skills can encourage students to be more active in environmental learning. (Idris, 2020) stated that engagement in environmental projects in school may improve students' self-efficacy, which then will strengthen the achievement of academic level as well as their understanding of environmental issues. Therefore, education needs to develop the three elements, i.e., self-efficacy, academic level, as well as environmental literacy in an integrated way to achieve optimal results in education and environmental awareness.

Academic level and environmental literacy are walking along together. From the environmental literacy side (Y), the result of SE calculation shows that X1 (self-efficacy) gives a 27.62% contribution, whereas X2 (academic level) gives a 14.41% contribution. Thus, academic level is less important than self-efficacy in determining environmental literacy.

According to (I Putu Oktap Indrawan, Agil Lepiyanto, Ni Wayan Mega Juniari & Intaran, 2023), students' cognition, environmental awareness, and learning motivation are aspects of environmental literacy that are affected by the environmental literacy, which eventually affect students' self-efficacy and academic level. Research by Aulia & Aji (2024) suggested that, considering that students are the future of the nation as well as bearing the responsibility to preserve functionality and roles of the environment, it is important to improve students' quality through the integration of environmental literacy with problem-solving skills. Improving students' capacity to solve environmental problems by improving their environmental literacy.

CONCLUSION

Based on the result of the research analysis, several conclusions can be drawn, i.e: self-efficacy of the 10th grade students of SMA Negeri 1 Limbangan is in the moderate category. The academic level is in the moderate category. Students' environmental literacy is in the moderate category. There is a fairly strong relationship between self-efficacy and environmental literacy of the 10th-grade students at SMA Negeri 1 Limbangan. There is a considerably strong relationship between the academic level and environmental literacy of the 10th-grade students at SMA Negeri 1 Limbangan. Therefore, schools should consider the unique differences of each student since each of them is different in various aspects and in their ability to absorb the learning material. Moreover, in carrying out the learning process, teachers should not only focus on students' cognitive of intellectual abilities but also on the teahcers themselves. It needs to be understood as well that various internal factors of the students themselves are affecting their learning results. The researcher thanks all who are willing to provide guidance, advice, and criticism in accomplishing the research. The researcher also apologizes for all of the shortcomings and mistakes within.

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