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Environment-based learning and global citizenship orientation in elementary social studies classrooms

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ABSTRACT

This study examines the effects of environment-based learning and global citizenship orientation on environmental awareness and social studies achievement in Indonesian elementary schools. Using a quantitative ex post facto correlational design, the study involved 180 fourth- and fifth-grade students, selected through cluster random sampling from four schools in Magetan, Indonesia. Data were collected using validated instruments, including scales of environment-based learning, global citizenship orientation, and environmental awareness, as well as a social studies achievement test. The data were analyzed using descriptive statistics, Pearson's correlation, and multiple regression. The results show that environment-based learning and global citizenship orientation significantly predict environmental awareness ($R^2 = .440$; $p < .001$) and social studies achievement ($R^2 = .212$; $p < .001$). Both variables influence affective outcomes more than cognitive performance. This study provides empirical evidence from the elementary school context and highlights the importance of integrating contextual environmental learning and global citizenship education to support students' holistic development.

Keywords: environment-based learning, global citizenship orientation, environmental awareness, social studies achievement, elementary education

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INTRODUCTION

Social studies education in elementary schools' shapes young citizens to become ecologically sensitive, socially responsible, and globally conscious. Amid increasing ecological crises such as environmental degradation, climate change, and unmanaged waste, students gain not only factual knowledge of social phenomena but also develop their ability to understand how their daily actions impact long-term societal and environmental conditions at both local and global levels (Casmana et al., 2023; Nugroho & Winarno, 2024). Therefore, social studies education serves not merely as a subject for memorizing concepts, but as a platform that cultivates environmental awareness, social responsibility, and global citizenship identity.

In many elementary schools, social studies are still dominated by teacher-centered instruction and heavy reliance on textbooks. Environmental and global issues are often taught separately from students' daily experiences, making it hard for them to connect practical realities, such as waste disposal at home and school, with broader problems like marine pollution, climate change, and social inequality (Kurniastuti et al., 2018). This mismatch diminishes the relevance of social studies learning and limits students' opportunities to develop critical awareness of socio-environmental issues (Onbaşılı & Yalman, 2025). In Indonesian elementary schools, including those in Magetan, learning practices still tend to emphasize conceptual understanding rather than the contextual exploration of local environmental problems.

In response to these limitations, educational approaches that integrate global perspectives have gained increasing attention. Research on global citizenship education (GCE) shows students

gain meaningful learning through authentic, collaborative, and contextually relevant activities. For example, King de Ramirez (2021) demonstrated that Collaborative Online International Learning (COIL) broadens students' global perspectives by linking local issues with global dynamics. Yet scholars argue that policymakers and teacher education programs keep GCE largely normative and fail to fully translate it into classroom practice. Eybers (2024) and Estellés and Fischman (2021) highlight that school curricula insufficiently integrate GCE, resulting in learning experiences that do not fully prepare students for 21st-century challenges. This underscores the need for pedagogical models embedding global citizenship perspectives in concrete, learner-centered ways (Shultz & Karsgaard, 2024).

Environment-based learning offers one such pedagogical approach. By encouraging students to observe, investigate, and reflect on socio-ecological phenomena in their immediate surroundings, this method bridges conceptual knowledge with real-world experiences (Siswanto et al., 2019). When integrated with a global citizenship perspective, it strengthens both environmental awareness and ethical responsibility beyond local boundaries. Ahmed and Mohammed (2021) found that effective GCE programs emphasize active, reflective, and action-oriented learning rather than solely declarative knowledge. Likewise, Waghid (2023) showed that structured discussions on global citizenship issues foster critical thinking, empathy, and social justice orientation. Blackford et al. (2024) further confirmed that work-integrated learning initiatives enhance global citizenship competencies and shape students' developing identities.

Despite its conceptual promise, empirical research in Indonesian elementary school contexts remains limited. More importantly, most existing studies examine environment-based learning and global citizenship education separately, with limited attention to their combined effects within a single quantitative model (Agustina et al., 2023; Rachmadtullah et al., 2020). This gap between theoretical expectations and classroom realities underscores the need for empirical research that integrates the affective and cognitive dimensions of learning.

Integrating environmental learning with a global citizenship orientation is increasingly important in 21st-century education, which emphasizes not only knowledge acquisition but also the development of critical thinking, problem-solving, and global awareness. Students are expected to become active participants in addressing complex socio-environmental challenges that cross national boundaries. However, without appropriate instructional strategies, these competencies may not be effectively developed in classroom settings. Therefore, there is a need to design learning approaches that simultaneously foster contextual understanding and global perspectives in a structured and measurable manner.

The lack of integrative empirical studies limits understanding of how instructional practices and students' value orientations shape learning outcomes. While theoretical frameworks emphasize the importance of linking environmental learning with global citizenship perspectives, empirical validation of this integration is insufficient, especially in elementary education contexts. This limitation not only constrains the development of evidence-based instructional models but also reduces the effectiveness of educational practices in fostering holistic student development. Therefore, a more comprehensive approach that examines both constructs simultaneously is necessary to provide a clearer understanding of their roles in influencing students' affective and cognitive outcomes. While students are expected to develop environmental awareness, social responsibility, and global citizenship, classroom practices remain largely teacher-centered, with limited integration of local environmental contexts and global values. This gap reinforces the need for an integrated instructional approach that systematically connects contextual environmental learning with global perspectives.

While previous studies have examined environmental learning and global citizenship education separately, few studies explore how these constructs jointly relate to students' environmental awareness and social studies achievement within a quantitative framework. This suggests the need for empirical research that captures both the affective and cognitive dimensions of learning within an integrated model.

This study offers a novel contribution by developing an integrated empirical model that simultaneously examines the effects of environment-based learning and global citizenship orientation on both affective (environmental awareness) and cognitive (social studies

achievement) outcomes. Unlike previous studies that treat these variables independently, this study reveals their distinct and complementary roles within a single analytical framework. The findings show both variables exert a stronger influence on affective outcomes than on cognitive performance, offering new empirical insights into how contextual and value-based learning approaches differ across learning domains. This contribution is particularly important in the context of elementary education, which remains underrepresented in empirical research. Therefore, this study extends existing literature by offering a more comprehensive understanding of the interplay between instructional practices and value orientations in shaping holistic student development.

The study aims to: (1) examine the relationship between environment-based learning and students' environmental awareness and social studies achievement; (2) examine the relationship between global citizenship orientation and these outcomes; and (3) analyze the simultaneous effects of environment-based learning and global citizenship orientation on environmental awareness and social studies achievement.

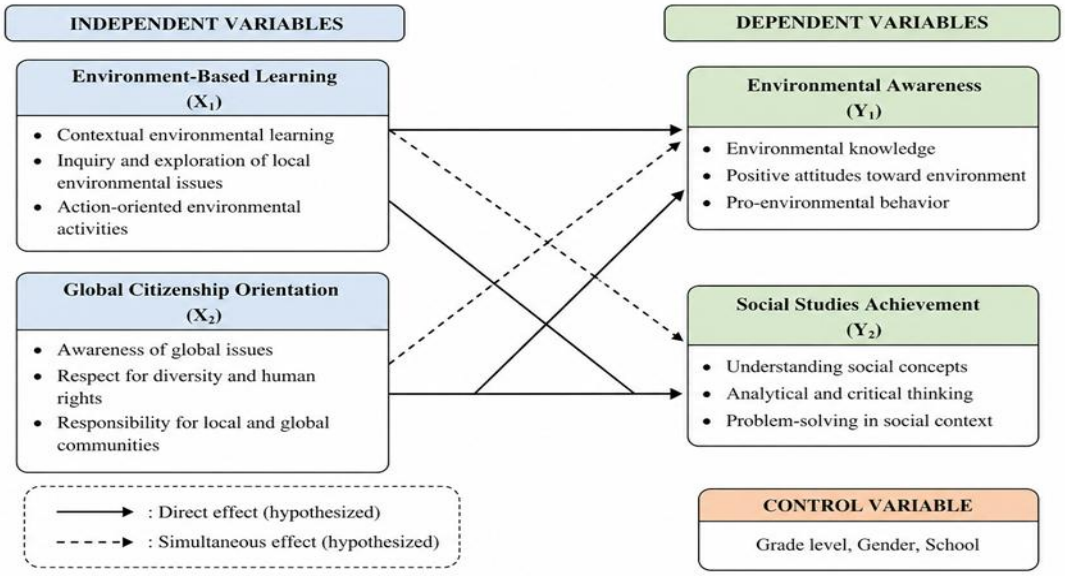
METHOD

This study employed a quantitative approach using ex post facto correlational design to examine the relationships among environment-based learning, global citizenship orientation, environmental awareness, and social studies achievement. The population consisted of fourth- and fifth-grade students attending public and private elementary schools in Magetan, Indonesia. A total of 180 students (n = 180) were selected using cluster random sampling: four schools were randomly selected, followed by random selection of classes within each school.

The independent variables were environment-based learning (X_1), defined as instructional practices integrating local environmental inquiry through observation, discussion, and project-based activities, and global citizenship orientation (X_2), referring to students' awareness, responsibility, and perspectives toward global issues. The dependent variables were environmental awareness (Y_1), defined as students' tendencies to engage in environmentally responsible behavior, and social studies achievement (Y_2), measured using cognitive test scores. To clarify the relationships among variables, the conceptual framework of this study is presented in Figure 1. As illustrated, environment-based learning (X_1) and global citizenship orientation (X_2) are each hypothesized to directly and simultaneously affect environmental awareness (Y_1) and social studies achievement (Y_2). In addition, environmental awareness is also assumed to contribute to social studies achievement, linking the affective and cognitive domains. Control variables, including grade level, gender, and school context, were considered to account for potential differences among participants.

Figure 1 illustrates the hypothesized relationships among the variables examined in this study. Environment-based learning (X_1) is assumed to have a direct relationship with environmental awareness (Y_1) and social studies achievement (Y_2). Similarly, global citizenship orientation (X_2) is expected to be associated with both environmental awareness and academic achievement. In addition, environmental awareness (Y_1) is proposed to contribute to social studies achievement (Y_2), indicating a potential linkage between affective and cognitive outcomes. These relationships form the basis for the statistical analyses conducted in this study. Four instruments were used to collect the data: a 24-item environment-based learning scale ($\alpha = .89$), a 20-item global citizenship orientation scale ($\alpha = .87$), an 18-item environmental awareness scale ($\alpha = .88$), and a 25-item multiple-choice test for social studies achievement (Y_2; KR-20 = .82). All instruments were validated through expert judgment involving experts in social studies education and educational measurement to ensure content validity prior to administration.

Data collection was conducted in classroom settings with teacher assistance. The questionnaires and achievement tests were administered simultaneously to ensure consistency in data collection procedures. Before administration, students were given clear instructions, and confidentiality of responses was assured. Ethical approval was obtained from the relevant institutional authority. Participation was voluntary, and informed consent was secured from both students and teachers.



Note. X_1 = environment-based learning; X_2 = global citizenship orientation; Y_1 = environmental awareness; Y_2 = social studies achievement.

Figure 1. Conceptual Framework of the Study

Data analysis was carried out using SPSS software. Descriptive statistics, including the mean, standard deviation, minimum, and maximum values, were used to summarize the data. Pearson correlation analysis was employed to examine the relationships among variables. Descriptive data were interpreted using score categorization: Category interval = (maximum score – minimum score)/number of categories. Results were classified as low, moderate, or high, aiding the interpretation of students' environment-based learning, global citizenship orientation, and environmental awareness.

Before conducting regression analysis, several assumption tests were conducted. The normality test showed the data was not normally distributed ($p < .05$). In addition, the homogeneity test using Levene's test also showed that the data were not homogeneous ($p < .05$). However, the analysis was continued because multiple regression is generally robust against violations of normality and homogeneity assumptions, particularly when the sample size is sufficiently large ($n > 100$) (Field, 2018; Hair et al., 2019). Furthermore, multicollinearity was assessed using tolerance and variance inflation factor (VIF), and the results showed tolerance values of 1.000 and VIF values of 1.000, indicating no multicollinearity issues. No extreme outliers were removed because they did not affect the results.

Multiple linear regression was used to assess the effects of environment-based learning (X_1) and global citizenship orientation (X_2) on environmental awareness (Y_1) and social studies achievement (Y_2). The significance levels were $\alpha = .05$ and $\alpha = .01$. The analytical procedures in this study aimed to ensure robust, valid findings. Although some statistical assumptions were unmet, multiple regression is widely accepted as robust with large samples (Field, 2018; Hair et al., 2019). Thus, the chosen methods are appropriate for addressing the research goals and providing reliable insights into the variable relationships.

FINDINGS AND DISCUSSION

Findings

The descriptive analysis offers an overview of the distribution and central tendencies of the variables examined in this study. Results show students experienced moderate levels of environment-based learning and global citizenship orientation. This suggests that instructional practices integrating environmental contexts and global perspectives are present in classroom settings, although they may not yet be implemented systematically or optimally.

In contrast, the level of environmental awareness among students appears lower than that of the independent variables. This finding indicates that although students are exposed to learning approaches that emphasize environmental and global issues, such exposure does not automatically translate into strong affective engagement or environmentally responsible attitudes. This gap suggests that the internalization of environmental values may require more sustained, experiential, and reflective learning processes.

Meanwhile, students' social studies achievement reflects a moderate level of cognitive performance, suggesting that students are still developing their academic competencies in this subject area. The variability in achievement scores also indicates that multiple factors beyond instructional practices, such as individual differences, prior knowledge, and learning engagement, may influence learning outcomes. These descriptive findings provide an important foundation for further analysis of the relationships among the variables. The results of descriptive statistical analysis are presented in Table 1.

Table 1. Descriptive statistics

Variable	N	Mean	SD	Min	Max
X1	180	3.02	1.04	1.00	4.00
X2	180	3.00	0.99	1.00	4.00
Y1	180	1.86	0.72	1.00	3.00
Y2	180	44.81	7.89	40.00	69.00

Table 1 confirms each variable's distribution. Environment-based learning (X_1) has a mean of 3.02 (SD = 1.04), and global citizenship orientation (X_2) has a mean of 3.00 (SD = 0.99), both falling in a moderate range. This shows students generally experience similar levels of exposure to environmental learning and global citizenship perspectives in the classroom.

In contrast, environmental awareness (Y_1) has a lower mean of 1.86 (SD = 0.72), indicating that students' affective responses toward environmental issues remain limited. This disparity between instructional exposure and affective response suggests that developing environmental awareness may need more intensive or sustained learning interventions. Meanwhile, social studies achievement (Y_2), with a mean of 44.81 (SD = 7.89), shows moderate academic performance with variability among students.

These results suggest that environment-based learning and global citizenship orientation are present, but their impact on awareness and academic outcomes may not be fully optimized. Further analysis is necessary to examine the relationships among these variables and their contributions to students' development. Table 2 presents the correlation matrix.

Table 2. Correlation matrix

Variable	X1	X2	Y1	Y2
X1	1	.000	.455**	.348**
X2	.000	1	.483**	.301**
Y1	.455**	.483**	1	.790**
Y2	.348**	.301**	.790**	1

*Note. **p < .01 (2-tailed); p < .05*

Table 2 shows no statistically significant relationship between environment-based learning (X_1) and global citizenship orientation (X_2) ($r = .000$, $p = 1.000$). This finding suggests that these two variables act independently in this study, indicating that students' experience with environment-based learning does not correspond with their orientation toward global citizenship.

Environment-based learning (X_1) demonstrates a moderate positive relationship with environmental awareness (Y_1) ($r = .455$, $p < .001$) and a weaker but still significant relationship with social studies achievement (Y_2) ($r = .348$, $p < .001$). This pattern indicates that learning experiences grounded in environmental contexts are more strongly associated with students' affective development than with their cognitive outcomes.

Similarly, global citizenship orientation (X_2) shows a moderate positive relationship with environmental awareness (Y_1) ($r = .483$, $p < .001$) and a weaker relationship with academic achievement (Y_2) ($r = .301$, $p < .001$). These findings suggest that students' global perspectives and sense of responsibility contribute more substantially to their awareness and values than to their academic performance.

Notably, environmental awareness (Y_1) exhibits a strong positive relationship with social studies achievement (Y_2) ($r = .790$, $p < .001$), indicating close links between affective and cognitive domains. This result implies that students who possess higher levels of environmental awareness tend to achieve better academic outcomes, highlighting the role of affective engagement in cognitive development.

Overall, the correlations indicate that environment-based learning and a global citizenship orientation are significantly associated with environmental awareness and, to a lesser degree, academic achievement. However, the absence of a relationship between the two independent variables suggests that they contribute to student outcomes through distinct and independent pathways. The results of multiple regression analysis for environmental awareness (Y_1) are presented in Table 3.

Table 3. Regression results for environmental awareness (Y_1)

Variable	B	SE	β	t	p
Constant	-0.146	0.175	—	-0.835	.405
X1	0.315	0.039	.455	8.089	< .001
X2	0.352	0.041	.483	8.594	< .001

Note: $R = .664$; $R^2 = .440$; Adjusted $R^2 = .434$; $F(2, 177) = 69.648$; $p < .001$

Table 3 shows that the regression model is statistically significant ($F(2, 177) = 69.648$, $p < .001$), suggesting that environment-based learning and global citizenship orientation jointly predict environmental awareness. The model explains 44% of the variance in environmental awareness ($R^2 = .440$), showing moderate to strong explanatory power.

Both independent variables significantly predict environmental awareness. Environment-based learning (X_1) has a positive and significant effect ($\beta = .455$, $t = 8.089$, $p < .001$), indicating that increased exposure to contextual environmental learning is associated with higher levels of students' environmental awareness. This finding highlights the role of experiential and context-based learning in fostering students' affective engagement with environmental issues.

Global citizenship orientation (X_2) also has a positive, significant effect ($\beta = .483$, $t = 8.594$, $p < .001$), indicating that students' global perspectives and sense of responsibility toward global issues contribute substantially to increased environmental awareness. The standardized coefficient for global citizenship orientation is slightly higher than that of environment-based learning, indicating that value-oriented perspectives may play a more dominant role in shaping students' awareness.

The constant term is not statistically significant ($p = .405$), indicating that the baseline level of environmental awareness, unaccounted for by the predictors, is not meaningful in this model. Overall, the findings demonstrate that both instructional practices and value-based orientations play complementary roles in influencing students' environmental awareness.

In addition to the model's statistical significance, the findings indicate that the combined influence of environment-based learning and global citizenship orientation underscores the importance of integrating contextual and value-based approaches to foster students' environmental awareness. The model's relatively high explanatory power suggests that these two variables are key contributors to affective learning outcomes. However, considering that 56% of the variance remains unexplained, it is likely that other factors, such as students' personal experiences, family background, and school environment, may also play a role in shaping environmental awareness. The regression results for social studies achievement (Y_2) are presented in Table 4.

Table 4. Regression results for social studies achievement (Y_2)

Variable	B	SE	β	t	p
Constant	36.205	2.286	—	15.840	< .001
X1	2.634	0.504	.348	5.223	< .001
X2	2.398	0.531	.301	4.517	< .001

Note: $R = .461$; $R^2 = .212$; Adjusted $R^2 = .203$; $F(2, 177) = 23.844$; $p < .001$

The regression results indicate that the model is statistically significant ($F(2, 177) = 23.844$, $p < .001$), demonstrating that environment-based learning and global citizenship orientation jointly predict social studies achievement. However, the model's explanatory power is lower than that of environmental awareness, accounting for only 21.2% of the variance ($R^2 = .212$), indicating a moderate level of predictive strength.

Both independent variables show positive and significant effects on social studies achievement. Environment-based learning (X_1) has a significant contribution ($\beta = .348$, $t = 5.223$, $p < .001$), suggesting that students who are more engaged in contextual environmental learning tend to achieve better academic outcomes. Similarly, global citizenship orientation (X_2) also has a significant effect ($\beta = .301$, $t = 4.517$, $p < .001$), indicating that students with stronger global perspectives tend to perform better academically.

The effect sizes of both predictors are smaller than in the environmental awareness model, suggesting that while instructional practices and global perspectives help cognitive outcomes, achievement depends on broader factors. These results show affective variables may directly shape awareness, while cognitive performance depends on more complex determinants.

Overall, the findings demonstrate that environment-based learning and a global citizenship orientation play significant, complementary roles in shaping students' learning outcomes. Both variables exert a stronger influence on environmental awareness than on social studies achievement, indicating that affective development is more directly shaped by contextual and value-based learning approaches. The absence of a statistically significant relationship between the two independent variables further suggests that they operate through distinct pathways, each contributing uniquely to students' development. In addition, the strong relationship between environmental awareness and academic achievement highlights the important interplay between affective and cognitive domains. These findings reinforce the importance of integrating environmental and global perspectives in elementary social studies education to support holistic student development.

Discussion

This study shows that environment-based learning and global citizenship orientation significantly shape students' environmental awareness and, to a lesser extent, their academic achievement. These results underscore the value of integrating contextual and value-based learning approaches in elementary social studies education. This aligns with evidence that student-centered and cooperative pedagogies can support elementary students' self-awareness, social awareness, meaningful interaction, and responsible decision-making (Karmina et al., 2024).

The significant influence of environment-based learning on environmental awareness is consistent with previous studies highlighting the effectiveness of contextual and inquiry-based learning in fostering students' environmental attitudes and behaviors (Rachmadtullah et al., 2020; Casmana et al., 2023). Learning activities that involve direct interaction with environmental issues deepen students' understanding and personal connections with ecological problems. This underscores experiential learning as key to fostering engagement and responsibility.

The strong link between global citizenship orientation and environmental awareness mirrors previous research on the role of global citizenship education in shaping students' awareness of global issues and social responsibility (Ahmed & Mohammed, 2021; Estellés & Fischman, 2021). Students exposed to global perspectives better understand environmental challenges and the need for collective action. This finding suggests that value-oriented learning is crucial in shaping students' sustainability attitudes.

However, the influence of both variables on social studies achievement is relatively weaker. In elementary social studies, active and project-based learning has been shown to improve both academic achievement and students' value-related attitudes, although the targeted affective domain may vary depending on the instructional focus (Widiana et al., 2021). This finding indicates that while environment-based learning and global citizenship orientation contribute to academic performance, cognitive outcomes are influenced by a broader range of factors. Previous studies have shown that academic achievement is shaped by multiple determinants, including instructional quality, learning motivation, and prior knowledge (Agustina et al., 2023). Therefore, although contextual and value-based learning approaches support cognitive development, their impact may be indirect and mediated by other variables.

An important finding of this study is the absence of a statistically significant relationship between environment-based learning and global citizenship orientation. This result shows that the two variables represent different but complementary dimensions of learning. Environment-based learning emphasizes students' contextual engagement with local ecological and social issues. Meanwhile, global citizenship orientation focuses on values, justice, global awareness, participation, and shared responsibility. The absence of a significant relationship indicates that global citizenship does not automatically develop through contextual environmental learning. Several studies confirm that global citizenship education requires an explicit curriculum framework, clear learning objectives, and intentional pedagogical strategies, especially those related to values, justice, participation, and global responsibility (Barry et al., 2024; Hameed et al., 2023; Hong, 2022; Kim, 2021). This interpretation is also consistent with previous studies showing that ecological and nature-based activities can foster environmental care, empathy, solidarity, and conservation practices, but responsibility as global citizens requires an intentional pedagogical framework (Idrissi, 2020; Widyanti & Tetep, 2021). Therefore, teachers need to intentionally connect local environmental issues with broader global concerns, such as climate change, waste circulation, water justice, and shared responsibility for the planet, if teachers want to develop students' global citizenship orientation.

Furthermore, the strong relationship between environmental awareness and academic achievement highlights the important interplay between affective and cognitive domains. This finding supports the argument that students who are more aware of and engaged with environmental issues tend to achieve higher academic performance. This finding can be explained by students' environmental literacy. In environmental education literature, it is stated that environmental literacy includes several dimensions, namely cognitive, affective, and behavioral. The affective aspect of environmental literacy includes concern, motivation, and responsibility, which are central to meaningful environmental learning (Lovren & Jablanovic, 2023). The involvement of the affective aspect in environmental learning can increase students' motivation, critical thinking, and participation in learning activities. This then ultimately contributes to improved learning outcomes. This is supported by previous research. Previous research findings also show that motivation, academic self-concept, and behavioral and cognitive engagement contribute to students' academic achievement (Wang & Eccles, 2013).

In summary, this study highlights the need to integrate environment-based learning and global citizenship education in elementary social studies. Such integration fosters holistic student development by supporting achievement, awareness, responsibility, and engagement with environmental and global issues. Future research should examine more factors affecting cognitive outcomes and explore the long-term impacts of integrated approaches.

CONCLUSION

This study concludes that environment-based learning and global citizenship orientation significantly shape students' environmental awareness and social studies achievement. The findings indicate that both variables have a stronger influence on affective outcomes, especially environmental awareness, than on cognitive outcomes such as academic achievement. Thus, contextual and value-based learning approaches are more directly associated with the development of students' attitudes, awareness, and responsibility toward environmental issues.

The study also highlights that environment-based learning and global citizenship orientation operate as distinct yet complementary dimensions. Their independent contributions emphasize the need for deliberate integration of both approaches in educational practice. Combining experiential environmental learning with global perspectives promotes holistic student development across affective and cognitive domains.

Furthermore, the strong relationship between environmental awareness and academic achievement underscores the importance of affective engagement in supporting learning outcomes. Students who demonstrate higher levels of awareness tend to be more engaged and perform better academically, indicating that emotional and value-based dimensions play a crucial role in the learning process.

These findings imply that elementary social studies education should not only focus on knowledge acquisition but also on developing students' environmental awareness and global responsibility. Future research is recommended to explore additional variables influencing academic achievement and to examine the long-term impact of integrated learning approaches in diverse educational contexts.

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