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Environmental education and ecological sensitivity shaping economics students behavior in Indonesia

Mila Indriastuti[1], Arief Budi Wardana[2*], Dhian Adhetiya Safitra[3], Pardomuan Robinson Sihombing[4]
[1]Faculty of Economics and Business, Universitas Muhammadiyah Prof. Dr. Hamka, Jakarta, Indonesia
[2]Diploma Program in Taxation, Politeknik Keuangan Negara STAN, Indonesia
[3]Diploma Program in Public Asset Management, Politeknik Keuangan Negara STAN, Indonesia
[4]Badan Pusat Statistik, Indonesia
*Corresponding author email: wardana.arief@pknstan.ac.id

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ABSTRACT

This study investigates the effect of environmental education and ecological sensitivity across different institutional types to environmental behavior among economics and business students in Indonesia. Using a quantitative approach, data were collected through a 35-item questionnaire administered to 565 students from economics and business faculties at institutions under the Ministry of Education, Culture, Research, and Technology and those coordinated by other ministries or government agencies. Data were analyzed using t-tests, Structural Equation Modeling–Partial Least Squares, and Multi-Group Analysis. The findings reveal significant differences in environmental behavior across institution types and show that environmental education and ecological sensitivity positively and significantly influence students' environmental behavior. This study extends the CADMIACA framework by integrating institutional context into the analysis of environmental behavior in Indonesia. However, the study is limited to economics and business students and relies on self-reported data. The results contribute to literature and offer implications for curriculum and policy.

Introduction

Environmental issues are global problems faced by almost all countries. Indonesia, for example, is the second-largest contributor to ocean plastic pollution after China, with an estimated 3.22 million metric tons per year (Jambeck et al., 2015; Tibbetts, 2015; weforum.org, 2025). In addition, economic and business activities have caused the loss of approximately 600,000 hectares of mangrove forests (Rudianto et al., 2020), as well as the deforestation of 1.03 million hectares of primary forest, equivalent to 842 million tons of CO_2 emissions in 2023 (globalforestwatch.org, 2024). This situation is caused by increased economic and business activities, land conversion for agriculture and plantations, and weak forest protection policies (Austin et al., 2019; Juniyanti & Situmorang, 2023; Rudianto et al., 2020). To address these issues, the United Nations established the Sustainable Development Goals (SDGs) in 2015, comprising 17 goals, including environmental protection and sustainable management of natural resources (Bappenas.go.id, 2024).

Various studies show that environmental damage and plastic pollution are not only caused by weak government policies (Qi et al., 2025); or industrial practices, but also by human behavior towards the environment (Duguma et al., 2019; Kyriakopoulos et al., 2020; Lange & Dewitte, 2019; Stern, 2000). Environmental behavior (EB) is a key factor in maintaining environmental quality. Hines et al. (1987), in a meta-analysis, found that environmental knowledge, strategic actions, and locus of control are important factors that encourage individuals to behave in an environmentally friendly manner. These factors are largely formed through the educational process, especially in higher education, which plays a strategic role in shaping students' character and behavior towards the environment (Hou et al., 2025; Kyriakopoulos et al., 2020; Qi et al., 2025).

Through Environmental Education (EE), universities play an important role in increasing Ecological Sensitivity (ES), which is sensitivity and responsibility towards ecological issues. Based on the Comprehensive Action Determination Model – Motivational, Interpersonal, and Action Competence Approach (CADMIACA), Varela-Candamio et al. (2018) emphasize that environmental education and intrapersonal factors significantly encourage the formation of environmentally friendly behavior. Therefore, integrating EE into higher education curricula is necessary to shape a young generation capable of making decisions oriented towards sustainability (Ferrer-Balas et al., 2010).

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In the Indonesian context, Research on E B in higher education is still dominated by studies conducted in homogeneous campus environments. In fact, the characteristics of higher education institutions in Indonesia are diverse, both in terms of ownership and institutional objectives. This study attempts to fill this gap by examining EB in two types of institutions, namely higher education institutions under the Ministry of Education, Culture, Research, and Technology (MoECRT) and higher education institutions under the coordination of other ministries/institutions (Ministry/Institution Higher Education Institutions/PTKL). The MoECRT group comprises the University of Indonesia (UI), Gadjah Mada University (UGM), and Prof. Dr. HAMKA Muhammadiyah University (UHAMKA), while PTKL is represented by the State Finance Polytechnic STAN (PKN STAN). The two groups have different orientations—MoECRT focuses on producing graduates who are competitive in the industrial world, while PTKL prepares graduates to become state officials. These differences in characteristics and institutional culture are thought to influence student behavior, especially among faculty members in the economics and business faculty.

Based on this background, this study aims to compare the levels of Environmental Behavior (EB) among economics and business students at various types of higher education institutions in Indonesia and to analyze the influence of Environmental Education (EE) and Ecological Sensitivity (ES) on EB, both overall and based on institution type. The main questions in this study are how EB levels differ between students under MoECRT and PTKL, and to what extent EE and ES influence EB among students at both types of higher education institutions. Theoretically, this study is novel in expanding the application of the Comprehensive Action Determination Model – Motivational, Interpersonal, and Action Competence Approach (CADMIACA) by considering the institutional context and culture of higher education in Indonesia in shaping students' environmental behavior. This approach offers new insights by linking psychological and institutional dimensions to explain how Environmental Education (EE) and Ecological Sensitivity (ES) influence students' Environmental Behavior (EB).

In practical terms, the results of this study are expected to inform policymakers and university administrators in formulating more effective curricula and educational policies to foster environmentally friendly behavior, particularly among economics and business students who will serve as decision-makers in industry and government in the future.

This article is organized as follows. The second section presents a review of the literature relevant to this study; the third section explains the research methodology; the fourth section presents the results and discussion; and the fifth section contains the conclusions and recommendations.

Literature Review

Theoretical Basis and Research Context

This study is based on the Comprehensive Action Determination Model – Motivational, Interpersonal, and Action Competence Approach (CADMIACA) developed by Varela-Candamio et al. (2018). This model explains that the interaction among motivation, education, and action competence shapes an individual's environmental behavior (EB). In the context of higher education, these factors can be realized through Environmental Education (EE) and Ecological Sensitivity (ES). EE shapes students' cognitive and affective aspects, while ES represents moral sensitivity and attitudes towards environmental issues.

The urgency of this research stems from the strategic role of economics and business students in shaping future industry policies and practices. Higher education institutions in Indonesia, both those under the Ministry of Education, Culture, Research, and Technology (MoECRT) and Ministry/Agency Higher Education Institutions (PTKL), have different institutional characteristics. These differences in educational missions are believed to influence students' environmental behavior. Therefore, understanding the relationship between EE, ES, and EB in this context is important for formulating effective, sustainable education policies.

Environmental Education (EE)

Environmental Education (EE) is a concept that emphasizes efforts to build attitudes, values, knowledge, and skills that encourage environmentally conscious actions (Monroe et al., 2019). EE plays a role at various levelsindividual (e.g., changes in attitudes and behavior), social (strengthening community capacity), and ecosystem (biodiversity conservation) (Ardoin & Bowers, 2020). Historically, EE began to develop in the 1960s and gained academic legitimacy in the 1970s within formal education (Tilbury, 1995). In the 1990s, this concept evolved into Environmental Education for Sustainability (EEfS), which is oriented towards long-term results and sustainable development (Tilbury, 1995).

EE is believed to be capable of changing human behavior towards the environment. Suárez-Perales et al. (2021) distinguish two main approaches to explaining the influence of EE on EB: the instrumental and the intrinsic approaches. The instrumental approach positions EE as a tool for changing people's behavior, while the inherent approach emphasizes awareness-building, critical dialogue, and independent action. Various studies show the effectiveness of EE in encouraging environmentally friendly behavioral change, both in early childhood education and higher education (Ardoin & Bowers, 2020; Kyriakopoulos et al., 2020; van de Wetering et al., 2022).

However, Glackin and King (2020) argue that the implementation of EE remains rhetorical and has not become a learning process truly oriented towards environmental goals. Nevertheless, the concept of EE remains relevant for application at the higher education level, given universities' role as forums for shaping the character and behavior of the younger generation towards sustainability issues.

Theoretically, the CADMIACA model explains that education is the main source of competence and motivation for pro-environmental action (Varela-Candamio et al., 2018). Through EE, students gain understanding and values that encourage them to act ecologically. Empirically, research by Ardoin and Bowers (2020), Kyriakopoulos et al. (2020), and van de Wetering et al. (2022) shows that the consistent implementation of EE has a positive effect on improving environmental behavior. Thus, the following hypothesis can be formulated:
H1: Environmental Education (EE) has a positive effect on students' Environmental Behavior (EB)

Ecological Sensitivity (ES)

Ecological Sensitivity (ES) refers to an individual's awareness of the reciprocal relationship between humans and the environment, as well as the willingness to protect ecological balance (Bricout & Gray, 2006). In the context of education, ES is the result of a learning process that fosters emotional attachment and moral responsibility towards nature (Hashimoto-Martell et al., 2012).

To measure ES, researchers have developed several instruments, such as the Ecological Scale, Environmental Concern Scale, and New Environmental Paradigm (NEP) (Hawcroft & Milfont, 2010). NEP is the most commonly used measuring tool and has undergone several revisions since its introduction. The revised version of the NEP (Dunlap et al., 2000) includes five main dimensions that describe human views of ecosystems. This instrument is relevant for use in higher education contexts because it can comprehensively measure students' levels of ecological awareness and sensitivity.

According to environmental behavior theory, ES serves as an affective factor that encourages individuals to take pro-environmental actions (Kollmuss & Agyeman, 2002). Individuals with high levels of ecological sensitivity tend to empathize with environmental damage and take concrete actions to prevent it (Grilli & Curtis, 2021). Several studies support the positive relationship between ES and EB, including Bozoglu et al. (2016), Li et al. (2019), and Žalėnienė and Pereira (2021), who found that students with high levels of ecological awareness exhibited stronger environmentally friendly behavior. Therefore, the second hypothesis is formulated as follows:
H_2: Ecological Sensitivity (ES) has a positive effect on Environmental Behavior (EB) among students.

Environmental Behavior (EB)

Environmental Behavior (EB) refers to individuals' actions to minimize negative environmental impacts (Kollmuss & Agyeman, 2002). EB includes simple behaviors such as saving energy and reducing plastic use, to active participation in environmental campaigns (Grilli & Curtis, 2021). EB is an important component in efforts to mitigate the environmental crisis because human behavior is at the root of most ecological problems (Bozoglu et al., 2016; Kyriakopoulos et al., 2020).

In general, the factors that influence EB can be grouped into internal factors (knowledge, values, and attitudes), external factors (policies, facilities, and social norms), and demographic factors (age, gender, and education level) (Kollmuss & Agyeman, 2002). In higher education, EE and ES are internal factors that play a dominant role in shaping students' EB. Therefore, this study positions EE and ES as independent variables that influence the EB of economics and business students in Indonesia.

Conceptual Model and Research Hypotheses

This research model was developed based on previous theories and research findings (Bozoglu et al., 2016; Dunlap et al., 2000; Kyriakopoulos et al., 2020; White et al., 2018; Zhu et al., 2017). The relationship between variables is visualized in Figure 1.

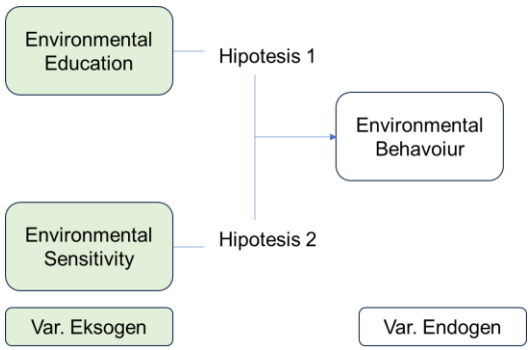

Figure 1. Research Model

Based on the research model in Figure 1, the author constructs the equation to be tested:

$$EB = a_1EE + a_2ES + e \quad (1)$$

This model is reflective, with the relationship between latent variables and indicators represented through questionnaire items adapted from previous studies. Based on this conceptual framework, the research hypotheses tested are:

H_1: Environmental Education (EE) has a positive effect on Environmental Behavior (EB).

H_2: Ecological Sensitivity (ES) has a positive effect on Environmental Behavior (EB).

Research Method

This study uses a quantitative approach with three latent variables, namely Environmental Education (EE), Ecological Sensitivity (ES), and Environmental Behavior (EB), which are measured using a 1–5 Likert scale questionnaire. Primary data were obtained from 565 active students of the Faculty of Economics and Business from two groups of higher education institutions, namely universities under the Ministry of Education, Culture, Research, and Technology (MoECRT) and Ministry/Agency Higher Education Institutions (PTKL). Data collection was conducted through an online survey using Google Forms, and the number of respondents met the minimum criteria for Partial Least Square–Structural Equation Modeling (PLS-SEM) analysis, which is ten times the number of the largest indicator in a single construct (Hair et al., 2011).

The research instruments were adapted from various previous studies. The EB indicators were taken from Bozoglu et al. (2016), Kyriakopoulos et al. (2020), and Müderrisoglu and Altanlar (2011); the EE indicators refer to Kyriakopoulos et al. (2020), White et al. (2018), and Zhu et al. (2017); while the ES indicators use the New Ecological Paradigm (NEP) scale from Dunlap et al. (2000). In total, 35 questions were measuring the three research constructs.

Data analysis was performed using Structural Equation Modeling–Partial Least Squares (SEM-PLS) in SmartPLS 3 (Ringle et al., 2015) to test relationships among latent variables, and t-tests in SPSS to identify differences in EB between university groups. The testing was conducted in two stages, namely the measurement model to assess validity and reliability (loading factor > 0.4; AVE > 0.5; Cronbach's Alpha and Composite Reliability > 0.7), and the structural model to test the hypothesis (p-value < 0.05; SRMR < 0.08; $Q^2 > 0$; GoF > 0.25).

Robustness testing was conducted to ensure model robustness through four steps: (1) bootstrapping 5,000 resampling to test estimation stability; (2) multicollinearity testing with a Variance Inflation Factor (VIF) value < 5; (3) evaluation of Predictive Relevance (Q^2) to assess the predictive power of the model; and (4) Multi-Group Analysis (MGA) to test the differences in the relationship between variables in the MoECRT and PTKL groups (Hair Jr et al., 2021). All analyses were conducted to ensure that the results were reliable, valid, and capable of describing the empirical conditions regarding the influence of EE and ES on the EB of economics and business students in Indonesia.

Results and Discussion

Table 1. Research Respondent Description Statistics

Variable	Categories	Frequency	Percentage
Gender	Male	233	41.2%
	Female	332	58.8%
Age	<20	265	46.9%
	20-25	288	51.0%
	>25	12	2.1%
Religion	Islam	486	86.0%
	Kristen Protestan	61	10.8%
	Kristen Katholik	11	1.9%
	Hindu	7	1.2%
Island	Sumatera	110	19.5%
	Jawa	408	72.2%
	Bali	10	1.8%
	Kalimantan	8	1.4%
	Sulawesi	8	1.4%
	Maluku	2	0.4%
	Nusa Tenggara	8	1.4%
	Papua	10	1.8%
	Timor Leste	1	0.2%
Type of campus	MoECRT	382	67.6%
	PTKL	183	32.4%
Type of program	Vocation	393	69.6%
	Research	172	30.4%

Source: Research Data, 2025

The questionnaire was filled out by 565 respondents from the MoECRT campus, which reached 32.4%, and the PTKL campus, which reached as much as 67.4%. When viewed from the gender distribution, it is not too unequal, with a ratio of 41% for men and 59% for women as shown in Table 1. The average age of respondents is 20.67 years, with the highest number being 31.15%, who are 19 years old. The respondents' education type is dominated by vocational education, which almost touches 70%, while the education level reaches 72% of students pursuing the S1/DIV level. The religious distribution of the respondents was mostly Muslim (86.02%), followed by Protestant Christianity (10.8%) in second place.

T-Test

This test is conducted to see if there is a significant difference in the EB value of respondents from the MoECRT and PTKL campuses. The results of this analysis are presented in Table 2. The data processing results show no significant difference in the value of EB between the two types of campuses. For this reason, we conducted a different test on the two factors suspected to affect EB, namely EE and ES.

Table 2. T-Test Result

		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Conclusion
EB T	Equal variances assumed	-1.604	563	.109	-1.47972	.92269	No different
EE T	Equal variances assumed	7.372	563	.000	2.38370	.32333	different
ES T	Equal variances assumed	4.660	563	.000	3.34868	.71859	different

Source: Research Data, 2025

SEM PLS and MGA

Validity test

Initially, the number of indicators for the variables EE, ES, and EB were 6, 15, and 14, respectively, as the questionnaire contained in Appendix 1. The validity test process checks the loading factor value of each latent variable and compares it with the minimum threshold of 0.7. As summarized in Table 3, the loading factor values obtained in the EE group are all above 0.7, but for EB only 4, while all ES latent variables are below 0.7 but still above 0.4. Based on Ertz et al. (2016), the loading factor value limit for environmental research is at least 0.4.

Table 3. Loading Factor Value

	Loading factor							
EB	Before	After	EE	Before	After	ES	Before	After
EB1	0.683	0.684	EE1	0.713	0.712	ES1	0.472	-
EB2	0.664	0.677	EE2	0.729	0.729	ES2	0.472	-
EB3	0.687	0.695	EE3	0.856	0.856	ES3	0.477	-
EB4	0.543	-	EE4	0.813	0.812	ES4	0.665	0.752
EB5	0.713	0.701	EE5	0.862	0.862	ES5	0.470	-
EB6	0.671	0.671	EE6	0.855	0.857	ES6	0.558	-
EB7	0.638	-				ES7	0.539	-
EB8	0.692	0.721				ES8	0.599	0.730
EB9	0.708	0.725				ES9	0.554	-
EB10	0.737	0.765				ES10	0.453	-
EB11	0.724	0.751				ES11	0.554	-
EB12	0.678	0.677				ES12	0.439	-
EB13	0.636	-				ES13	0.602	-
EB14	0.638	-				ES14	0.631	0.788
						ES15	0.528	-

Source: Research Data, 2025

To further ensure validity, researchers looked at the AVE value. As shown in Table 4, it turned out that EB and ES were below 0.5, so this model needed to eliminate latent variables. The elimination procedure involves removing the latent variable with the smallest value. The elimination process will stop when the AVE value is at least 0.5. The result is that the number of latent variables for EE eliminated 12, while EB 4.

Table 4. Average Variance Extracted (AVE) Value

	Average Variance Extracted (AVE)	
	Before	After
EB	0.454	0.500
EE	0.651	0.651
ES	0.290	0.573

Source: Research Data, 2025

Next, it is necessary to test the validity of discrimination, namely with the Fornell-Larcker Criterion. As presented in Table 5, the results show that the root AVE between constructs is greater than the correlation with other variables. Discriminatory validity is also met by looking at the cross-loading in each variable. For this reason, it can be concluded that this model passes the validity test and is used in the next test.

Table 5. Fornell-Larcker Criterion

Fornell-Larcker Criterion	EB	EE	ES
EB	0.707		
EE	0.444	0.807	
ES	0.305	0.369	0.757

Source: Research Data, 2025

Reliability test

The authors used Cronbach's Alpha and Composite Reliability value indicators to assess the model's reliability. A model is declared reliable if the CA and CR values are 0.7 (Hair Jr et al., 2020). Based on the results in Table 6, the model that has passed the elimination process produces a CA value above 0.7 for the EB and ES variables. As for ES, the CA value is 0.628. This value is below the criteria set by Hair et al. (2020) but is still acceptable. For this reason, we look at the CR value, which turns out to have met the minimum limit of 0.7 in all variables.

Table 6. Cronbach's Alpha and Composite Reliability Value

	Cronbach's Alpha		Composite Reliability	
	Before	After	Before	After
EB	0.907	0.889	0.921	0.909
EE	0.891	0.891	0.917	0.917
ES	0.826	0.628	0.858	0.801

Source: Research Data, 2025

Model structure test

In this test, researchers examined the Predictive Relevance (Q^2) and goodness of Fit (GoF). The results, presented in Table 7, show a Q^2 value is 0.10, above the minimum value of 0. While GoF almost touches the large category with a value of 0.355. Based on these two results, the model structure is declared fit.

Table 7. Predictive Relevance (Q^2) and goodness of Fit (GoF) Value

	R Square	R Square Adjusted	GoF	Q2
EB	0.22	0.217	0.355	0.1

Source: Research Data, 2025

Predictive relevance determines how well the observations are made and the structural relevance of the model by looking at the Stone Gaiser value Q Square. If it is positive, the observation value is good or has good structural model predictive relevance (Hair et al., 2021). The Q^2 value in this study is 0.10 and is positive, so the model has good predictive relevance. This study has a Goodness of Fit (GoF) of 0.355, according to Wetzels et al. (2009), this value indicates that the model has a moderate GoF, almost touching the large category with a value of 0.36.

Hypothesis testing

This hypothesis testing is used to evaluate which indicates the effect of one latent variable on another latent variable. The effect is declared significant when the P-values are 0.05, and the hypothesized t-statistic value is 1.984. Using bootstrapping analysis, the test results are shown in Table 8.

Table 8. Hypothesis Test Result

Effect	Coefficient	T stat	P Values	Conclusion
EE → EB	0.383	9.217	0.000	Significant positive
ES → EB	0.163	3.310	0.001	Significant positive

Source: Research Data, 2025

This test is conducted to see if there is a significant difference in the EB value of respondents from the MoECRT and PTKL campuses. The data processing results show no significant difference in the value of EB between the two types of campuses. For this reason, we conducted a different test on the two factors suspected to affect EB, namely EE and ES.

The table above reflects the path coefficients, which are the results of testing the direct effect. The results show that the effect of EE on EB has a t-statistic value more significant than the critical value (9.217 > 1.984) and p-values smaller than alpha (0.000 > 0.05). So, H1 is accepted, and it is concluded that environmental education has a positive and significant influence on improving environmental behavior. Environment sensitivity positively affects environmental behavior, with a t statistic of 3.310 (p=0.001). By paying attention to the significance value of P Values from *bootstrapping*, it is known that the two exogenous variables independently or partially affect the endogenous variables, with the coefficient value of the EE variable of 0.383 and ES of 0.163. So that the model of this study can be written as follows.

$$EB = 0{,}383EE + 0{,}163ES + e \quad (2)$$

From the equation above, it can be translated that a 1% increase in EE will increase 38.3% of EB, and a 1% increase in ES will increase 16.3% of EB.

Hypothesis testing using SEM PLS above is still at the aggregate level for all respondents. Determining the effect of EE and ES on EB at a more specific level requires multi-group analysis (MGA) testing. Based on this test, as shown in Table 9, information is obtained that the EE and ES variables still have a positive and significant effect on EB, both on the MoECRT and PTKL campuses.

Table 9. MGA Result

(MoECRT)	Coefficient	t stat	p-value	Conclusion
EE → EB	0.495	8.150	0.000	positive effect
ES → EB	0.287	3.891	0.000	positive effect
(PTKL)	Coefficient	t stat	p-value	Conclusion
EE → EB	0.415	9.316	0.000	positive effect
ES → EB	0.117	2.063	0.020	positive effect
	Path Coefficients-diff (|MoECRT - PTK |)	p-Value (MoECRT vs PTK)		Conclusion
EE → EB	0.080	0.143		no different
ES → EB	0.170	0.035		different

Source: Research Data, 2025

However, the magnitude of the influence is not the same. Here, it can be seen that the coefficient value on the MoECRT, both EE and ES, is relatively larger than the coefficient on the PTKL campus. This means that EE and ES on students from the MoECRT campus significantly influence EB. However, if we look at the difference in the magnitude of the influence between the two campuses, what is significantly different is the relationship between ES and EB.

Comparison of EB scores between MoEC and PTKL students

There is no significant difference in EB scores between MoECRT students and PTKL campuses. However, when looking at the two factors that influence EB, namely EE and ES, there are significant differences between the two types of campuses. In general, EE and ES values are relatively higher on PTKL campuses. This raises questions, considering that EE is supposed to be the central pillar in providing education (Reid et al., 2021). The MoECRT should be better positioned to implement EE under its supervision than PTKL on campuses. However, when speaking globally, Indonesia is not alone because, in other countries, the government has not seriously made policies encouraging EE implementation in education (Glackin & King, 2020).

Higher EE scores in PTKL are due to the character-building program in implementing education as a companion to the academic curriculum. Like academic teaching, the character-building program at PKN STAN as a representative of the PTKL campus also has a curriculum. Generally, character building has three phases: the

planting, growing, and developing stages. There are parenting guidelines (PP) for the Semester Parenting Program (PPS) at each stage. Another thing that can foster the EE of PKN STAN students is that there are more rigid rules binding students starting from Director Regulation Number 4 of 2023 concerning Student Rights, Obligations, and Discipline; Code of Conduct, Dormitory Life Guidelines, and Guidelines for the Use of Suggestions and Infrastructure. Almost all these rules require PKN STAN students to maintain and maintain environmental cleanliness. In addition, boarding students are prohibited from using electronic devices with heating element components. Another environment-related rule is the obligation to use water and electricity sparingly and wisely. Thus, the combination of the implementation of character-building programs and stricter rules is the differentiator of EE between PTKL and MoEC.

There are significant differences between the two groups of students studied in this research, namely students from PKN STAN under the MoF and from universities under the MoECRT. In addition to the difference in the supervising ministry, these two Ministry students have differences in the education system. PKN STAN is a vocational college, while the other group is an academic college. The fundamental difference between academic and vocational education is the domination of practicum activities aimed at specific skills so that students are ready to work, while academic colleges are more likely to implement a theory-based curriculum (Catterall et al., 2014).

In the context of vocational education at PKN STAN, several academic and non-academic activities are thought to affect environmental sensitivity, such as PKN STAN's frequent interaction with institutions related to the environment, such as the Environmental Fund Management Agency (BPDLH), the Directorate General of State Assets (DJKN) Directorate of Natural Resource Valuation, and the Center for State Assets and Fiscal Balance Education (Pusdiklat KNPK), and the Ministry of Environment and Forestry (KLHK). This interaction is related to the practicum curriculum of several courses, such as sustainability accounting, natural resource valuation, benefits analysis, and socioeconomic impact. New policies related to the character-building curriculum are thought to affect students' environmental sensitivity.

Some differences in the character of universities, both the ministry that oversees the type of education based on vocational or academic, are thought to affect Environmental Sensitivity (ES). This is based on the literature that a study conducted by Sivek (2002) found that the dominant factors influencing ES are [1] learning time spent outdoors, [2] male gender teachers, and [3] role models with friendly personalities. Sivek (2002) opinion is still confirmed in other studies. Öteleş and Demir (2023) confirmed that practicum/project-based teaching increases ES. ES is the emotional quality of individuals responding to ecological problems that represent problems with feelings of like or dislike of known environmental issues and how deep the knowledge or information obtained by individuals on environmental change/damage (Bala et al., 2023). The concept of practicum in learning is more likely to be found in vocational education. By integrating practicum and project-based learning concepts with knowledge related to environmental issues, ES will ideally increase.

Measuring the effect of EE and ES on EB

Statistically, the results of SEM PLS data processing have proven that EE and ES influence EB from university students in Indonesia. The influence of both is significant and positive, which means it is no different from previous literature that discusses environmental issues in education. Using the CADMIACA model, which comprehensively explores all factors, Varela-Candamio et al. (2018) confirm that EE is a powerful tool for changing people's behavior and being aware of the environment. The same thing was also revealed by Jabbour et al. (2013) and Kyriakopoulos et al. (2020) although students have moderate levels of EE and moderate ES, both have a positive relationship with EB. Ferrer-Balas et al. (2010), later found that for EB to be effectively absorbed, the university needs to transition and provide EE comprehensively and systematically. This comprehensive and systematic EE comes from the "transition management" approach offered by Stephen and Graham, which uses new learning methods and assessments and takes a participatory approach for university members (Ferrer-Balas et al., 2010).

Let us first discuss the concept of EE, which has existed for more than 50 years. The educational process implemented by various types of campuses in Indonesia has brought students to have EB. This is quite encouraging, considering that campuses in Indonesia have not implemented EE in every curriculum (Nomura, 2009). The higher education system in Indonesia has four main stages: input, process, output, and outcomes. The outcomes of each study program are also measured based on the target graduates and soft skills needed by both the community and users of higher education graduates (Mendikbud, 2020), which are usually related to the world of work. Even within six years, the national standard of Higher Education has undergone three changes, starting from Permenristekdikti No. 49 to Permendikbud No. 3 of 2020. However, there is no specific discussion about these standard changes in environmental education.

In addition to the standards issued by the MoECRT, the Independent Accreditation Agency for the Scope of Economics and Business (LAMEMBA) also does not require specific criteria related to environmental education in the education process. Therefore, the application of EE is an initiative of each university or even individual lecturers who are not supported administratively. For example, a University under the MoECRT that is aware of the

environment will establish a community service program for the environmental studies center to encourage students to do community service that carries the theme of SDGs (PSLH, 2024). In addition, student organizations also actively participate in and support SDG's competition activities, such as UI SDGs Summit (UI SDGs Summit, 2024). Sometimes, EE emerges from off-campus organizations, as Nomura (2009) mentioned, and the initial form of EE in Indonesian universities was the Student Association for Environmental and Adventure Activities.

The research objects from two ministries (MoECRT and PTKL) have similar systems with different outcomes. The profile of graduates from the PTKL campus is more specific to becoming ASN candidates (PKN STAN, 2024). As for the MoECRT campus, the outcomes expected from the education process are broader. For example, one study program at FEB UI designs the curriculum to produce graduates ready to work as professionals and researchers (FEB UI, 2024). This difference gives its color or characteristic to the overall educational process.

EE and ES variables are formed from several indicators. It is interesting to discuss the indicators in the EE variable that have the most significant influence, respectively E5 and E6. Suppose EE6 explores the cultivation of initiatives to take real action for the environment during the study. EE5 is related to the experience of students preparing to be future leaders who care about the environment. As for the ES variable, the indicator with the largest factor loading value is related to the statement, "Humans will eventually learn enough about how nature works to be able to control it."

Although both have a positive and significant effect, this study shows that the influence of EE on EB is more significant than that of ES. The difference in the influence of the two is relatively significant, whereas the value of the influence of EE is twice as significant as that of ES. This phenomenon can be understood because high ES does not guarantee that it manifests in actual actions toward the environment (Kyriakopoulos et al., 2020). This also applies to EE, where Kyriakopoulos et al. (2020) explain that EE's low penetration into EB in Greece is due to the weak culture of togetherness there. In the Indonesian context, the influence of EE that outperforms ES is helped by a reasonably culturally solid factor of sharing with the community (Saide et al., 2019). This was mentioned by Nomura (2009), who stated that a nature lovers' association on campus was an early form of EE in Indonesia.

Comparison of the effect of EE and ES on EB between MoEC vs PTKL

The results of the MGA test stated that the effect of EE and ES on universities under MoEC was greater than that of PTKL. This indicates that students under MoEC with lower EE and ES eventually reach the same level as PTKL students. Several factors could explain this phenomenon. First, as found by Ferrer-Balas et al., (2010), in order to achieve effective EE, a participatory and comprehensive approach to learning is necessary. Educational programs within the MoECRT are designed to provide direct and relevant experiences for students. This is evident in the "*Merdeka Belajar Kampus Merdeka*" (MBKM) program, the massive environmental awareness competition movement created by student activists under the student executive body (BEM) (UI SDGs Summit, 2024), as well as scientific writing competitions that focus on the environment. So, the influence of the approach to providing environmental education and the program's effectiveness at the MoECRT can allegedly trigger students to be environmentally conscious.

Second, environmental sensitivity is a sensitivity to nature that has a direct and positive relationship to all pro-environmental activities (Kukkonen et al., 2018). The massive pro-environmental programs carried out by students allow them to be directly involved in these activities so that they will be aware of the impact of their actions on the environment. This awareness can motivate them to behave responsibly towards the environment.

Third, the educational environment in MoEC supports and encourages pro-environmental behavior. This aligns with Stephens and Graham (2010) findings that sustainability in higher education can be formed when there is a top-down university management transition. This means that the transition towards environmental awareness comes from the university's vision, which is passed down to all elements of the organization, including access to environmental resources, a culture that values sustainability, and support for teaching staff. All these comprehensively managed elements can make the influence of EE and ES more significant on environmental behavior.

The conclusion related to the MGA results is that combining transition management with a comprehensive approach to students creates practical environmental education (EE), high environmental sensitivity (ES), and a supportive educational environment accompanied by resource support. These factors contribute more to environmental behavior in MoEC than in PTKL.

Policy Implication

The results of this study provide quite exciting results regarding the contribution of Environmental Education to Environmental Behavior. If the government wants to create a society that saves energy and chooses to use public transportation, then the policy is to try to improve environmental behavior (Grilli & Curtis, 2021). In the context of this study, an increase in environmental education will occur if there is a government policy leading to an increase in environmental education and environmental sensitivity. By looking at the magnitude of the coefficients of these

two variables, government priorities can focus on improving environmental education. With the government's commitment to education, reflected by a minimum education budget of 20% of the government budget, policies tucked into the education system will be more realistic to implement. Increasing EE can be integrated with factors that increase ES, such as increasing practice or projects in learning activities (Öteleş & Demir, 2023; Sivek, 2002).

In Indonesia, the education system is divided into several levels, from early childhood to higher education. The scheme of improving environmental behavior in students can be done in stages, where the principle of habituation is applied at the early childhood education level to secondary education. At the higher education level, sustainability-based curriculum policies are implemented. In addition, students at the higher education level are future economic actors and policymakers (Shafiei & Maleksaeidi, 2020).

From a practical point of view, increasing environmental behavior through the proxy of environmental education can be done through several channels. For dormitory campuses such as PKN STAN, it can implement habituation policies in waste management and encourage habituation to an environmentally friendly lifestyle. For boarding and non-forming campuses, campuses can encourage students to be involved in activities or programs engaged in environmental sustainability. In addition to establishing a green lifestyle on campus through the intervention of educational institutions, campuses also begin to use environmentally friendly products and services such as procuring environmentally friendly official cars, using environmentally friendly lights, and providing information related to environmentally friendly lifestyles.

Conclusion

The level of EB in students on two types of campuses in Indonesia shows an insignificant difference. Instead, significant differences occur in the EE and ES variables, where the two variables are more substantial on the PTKL campus. The presence of character-building programs and strict regulations on PTKL students form a relatively higher EE value compared to the MoECRT campus. The tendency of higher ES in PTKL is obtained from the learning concept of vocational higher education, which dominantly applies the concept of practicum or project, supporting previous research results.

Furthermore, the SEM PLS data analysis results show that EE and ES significantly influence EB in higher education in Indonesia. This result does not contradict several studies conducted outside Indonesia. It is surprising that EE in Indonesia, which has not yet received a formal place in educational standards, can significantly influence EB. The existence of fruit programs based on the creativity of the academic community and organizations outside the university structure supports the presence of EE in Indonesian students. Although not as great as EE's, ES influences EB's level.

Another finding in this study is that students under the MoECRT with lower EE and ES will eventually reach the same EB level as PTKL students. This is due to various factors such as a combination of management transition that comprehensively shapes EE, practical approaches through student projects, and resource support that significantly contributes to the environment at universities under MoECRT. Therefore, it is an opportunity for the Indonesian government to use the 20% state budget allocation for the education sector to bring EE to all levels of education.

The limitations of this study are related to the distribution of questionnaires only to students studying at the faculty of economics and business. In addition, this study did not sample students from all universities under the MoECRT and PTKL. Statistically, the influence of the variables discussed in this study does not include all other variables that may have an effect. For this reason, there is an opportunity for further research by increasing the number of respondents and reaching more study programs and campuses. Model refinement by adding relevant variables also has the opportunity to be done in the next study.

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Appendix 1. Questionnaire Questions

Indicator	Question
ENVIRONMENTAL BEHAVIOR (EB)	
EB 1	Do you read articles/news/publications that focus on environmental issues?
EB 2	Do you discuss environmental issues when talking to others?
EB 3	Do you try to get information about what you can do to help solve environmental problems?
EB 4	Do you watch TV/internet programs about environmental issues?
EB 5	Do you recycle paper and newspapers? (Example: by participating in waste bank activities)
EB 6	Do you recycle bottles or glass jars or aluminum containers? (Example: by participating in waste bank activities)
EB 7	Do you sort your waste by separating non-recyclable materials from recyclable materials? (Example: by participating in waste bank activities)
EB 8	Do you choose to change product brands because of environmental concerns?
EB 9	Do you use environmentally friendly detergents? (recognizable by its less foam and easy rinsing, e.g. purely natural laundry soap; green wash; etc.)
EB 10	Do you read labels on products to find out if they are environmentally safe?
EB 11	Have you stopped buying a product from a company because you believe it is a burden to the environment?
EB 12	Do you take the initiative to participate in cleaning or improving the city/community environment (e.g. becoming a waste bank manager, participating in community service, etc.)?
EB 13	Do you report environmental or animal crimes to the authorities?
EB 14	Do you donate money or subscribe (social media/magazine) to organizations that protect the environment? (e.g. Instagram pandawagroup; kertabumirecyclingcenter; etc.)
EB 15	Do you discuss environmental issues when talking to others?
EB 16	Do you try to get information about what you can do to help solve environmental problems?
ENVIRONMENTAL EDUCATION (EE)	
EE 1	Does education and teaching on your campus foster environmental awareness? (Example: The campus provides labels for protecting the environment such as labels for turning off lights, saving water, disposing of garbage according to its type; provision of bicycles/public transportation facilities on campus).
EE 2	Does education and teaching on your campus add knowledge about environmental issues? (Example: Your study program provides compulsory/elective courses on environmental issues such as sustainability accounting, *green accounting*, etc.; The study program provides SKS conversion facilities when students take part in *UI Design for climate change resolution sustainable development*)
EE 3	Does education and teaching on your campus instill critical thinking in looking at environmental issues? (Example: the campus facilitates seminars on the environment, talk shows related to environmental conditions)
EE 4	Does education and teaching on your campus instill environmental problem solving? (Example: Lecturers give assignments related to environmental issues)
EE 5	Does education and teaching on your campus instill initiative to take action in the future with regard to the environment? (Example: The campus encourages students to take part in volunteer activities related to the environment, post reposts etc. related to environmental issues on your social media, create educational content related to environmental issues)
EE 6	Does education and teaching on your campus shape future managers who are environmentally conscious? (encouraging students to create an environmentally friendly campus movement, for example reducing the use of plastic waste, sorting waste, utilizing public facilities. Encourage students to participate in environmentally conscious competitions, for example: *voice of youth challenge*. Encouraging students to initiate *go green* expo activities)
ENVIRONMENTAL SENSITIVITY (ES)	
ES 1	Do you agree with the statement "We are approaching the limit of how many people the earth can support."
ES 2	Do you agree with the statement "Humans have the right to change the natural environment to suit their needs."
ES 3	Do you agree with the statement "When humans interfere with nature, it often has disastrous consequences."
ES 4	Do you agree with the statement "Human intelligence will ensure that we make the Earth habitable."
ES 5	Do you agree with the statement "Humans are seriously abusing the environment."
ES 6	Do you agree with the statement "Earth has many natural resources if we learn to develop them."
ES 7	Do you agree with the statement "Plants and animals have the same right to live as humans."
ES 8	Do you agree with the statement "The balance of nature is strong enough to overcome the impact of modern industrialized countries."
ES 9	Do you agree with the statement "Despite having special abilities, humans are still subject to the laws of nature."
ES 10	Do you agree with the statement "The so-called "ecological crisis" facing humanity has been exaggerated."
ES 11	Do you agree with the statement "Earth is like a spaceship with very limited space and resources."
ES 12	Do you agree with the statement "Humans are meant to rule over all of nature."
ES 13	Do you agree with the statement "The balance of nature is very fragile and easily disturbed."
ES 14	Do you agree with the statement "Humans will eventually learn enough about how nature works to be able to control it."
ES 15	Do you agree with the statement, "If things continue as they are now, we will soon experience a major ecological disaster."