

Influence of Environmental Empathy on Ethical Reasoning and Decision-Making for Environmental Sustainability Among Adolescent Learners



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Abstract

The 21st century's environmental problems require not only scientific solutions but also a shift in individual's moral behaviors and feelings towards the environment. The growing urgency of environmental issues has underscored the need to understand the psychological and ethical dimensions that drive sustainable behavior, particularly among adolescents. The importance of promoting environmental sustainability in all spheres of society has been brought to light in recent decades by the pressing need to address worldwide sustainability problems such as pollution, deforestation, biodiversity loss, and climate change. Education is vital for developing beliefs, attitudes, and behaviors that foster sustainable development, especially in adolescent learners. This study explores the influence of environmental empathy on ethical reasoning and decision making for environmental sustainability among adolescent learners aged between 15 to 17. The population of the study comprises all adolescent learners across Kerala. Utilizing a normative survey method, data were collected from a representative sample of 200 higher secondary school students drawn from various educational institutions across Thiruvananthapuram. The data was collected using Environmental Empathy scale, Ethical Reasoning test and Decision-making test through random sampling. The analysis revealed a positive and significant relationship between environmental empathy and both ethical reasoning and decision making. Environmental Empathy influences significantly on Ethical Reasoning and Decision-making abilities of adolescent learners. The findings suggest that adolescents with higher levels of empathy towards the environment are more likely to make ethical and sustainable choices. Also, Environmental Empathy is a significant predictor of Ethical Reasoning and Decision-making abilities of adolescent learners for Environmental Sustainability. The study highlights the importance of integrating emotional and ethical components into environmental education to foster responsible and sustainability-oriented behavior among young learners.

1. Introduction

Environmental crises such as climate change, deforestation, biodiversity loss, and pollution are no longer distant threats—they are urgent realities impacting every facet of life on Earth. These crises are intertwined with social, economic, and ethical issues, demanding a response that transcends traditional disciplinary boundaries. Addressing them requires not only technological innovation and policy reform but also a profound transformation in individual mindsets and behaviours. A crucial driver of this transformation is environmental empathy—an emotional and cognitive connection to nature that fosters ethical awareness and sustainable decision-making (Berenguer, 2007).

In a world characterized by rapid digitalization, globalization, and socio-political complexity, education must evolve to equip learners with the ability to navigate uncertainty and act responsibly. The integration of environmental empathy, ethical reasoning, and decision-making into educational frameworks aligns with the competencies needed for global citizenship and sustainable development. These include systems thinking, anticipatory thinking, critical reflection, collaboration, and integrated problem-solving (UNESCO, 2017). Adolescent learners' engagement with environmental sustainability is moulded by a variety of interrelated factors, including environmental empathy, ethical reasoning, and decision-making. All of them come together to build a dynamic framework that helps young people get more connected to nature, realise the ethical implications of their conduct, and make actions beneficial to the planet.

2. Need and Significance of the Study

The urgency of promoting environmental sustainability in all spheres of society has been brought to light in recent decades by the pressing need to address worldwide sustainability problems such as pollution, deforestation, biodiversity loss, and climate change. Despite global agreements and scientific warnings, unsustainable practices continue to dominate, highlighting a gap between knowledge and action. Education is vital for developing beliefs, attitudes, and behaviors that foster sustainable development, especially in adolescent learners. The well-being of present and future generations is at an unprecedented risk due to the worsening global ecological crisis, which is highlighted by pollution, resource depletion, biodiversity loss, and climate change. Adolescence is a crucial period for cultivating pro-environmental attitudes and behaviours since it is a pivotal developmental stage characterised by tremendous cognitive, emotional, and social changes. In this phase, people strengthen their identities, expand their abilities for moral reasoning, and start to pay more attention to social issues.

Environmental empathy bridges this gap by fostering emotional engagement with ecological issues (Schultz, 2000; Tam, 2013). In the 21st century context, this emotional connection becomes critical for cultivating global citizens who not only understand environmental challenges but also feel compelled to act. Adolescents are a pivotal demographic: they are digital natives exposed to complex global realities and are simultaneously in a formative phase of moral and cognitive development (Piaget, 1952; Stevenson et al., 2014). Integrating environmental empathy into education empowers adolescents to confront sustainability challenges not as abstract issues but as personal and ethical concerns. It enhances their ability to reason through multifaceted dilemmas, take diverse perspectives, and ultimately make informed and ethical decisions (Clayton & Myers, 2009; Mayer & Frantz, 2004). Adolescents with high levels of environmental empathy are more likely to engage in prosocial and environmentally responsible behaviours (Tam, 2013). For effective environmental education and the advancement of a sustainable future, it is crucial to comprehend the factors that influence adolescent learners' engagement with environmental sustainability.

Environmental empathy involves an emotional resonance with nature, leading individuals to value and protect the environment intrinsically. This construct extends beyond simple awareness or knowledge and taps into the emotional and psychological processes that underpin moral development (Schultz, 2000). Adolescents with high levels of environmental empathy are more likely to engage in prosocial and environmentally responsible behaviors (Tam, 2013). Empathy—especially as it extends beyond humans to encompass the natural world—has been increasingly recognized as a critical driver of ethical reasoning and pro-environmental behavior. Studies demonstrate that environmental empathy—the capacity to understand and share the feelings of non-human entities—directly influences the quality and type of moral arguments people make regarding ecological dilemmas. Empirical studies suggest that empathy facilitates perspective-taking, a skill fundamental to ethical reasoning (Chawla, 1999; Schultz, 2000; Tam, 2013; Clayton & Myers, 2009; Mayer & Frantz, 2004). For example, students who experience empathy toward affected ecosystems or species are better able to evaluate environmental dilemmas not only from a utilitarian standpoint but also through deontological and care-based ethics (Fransson & Gärling, 1999). Consequently, environmental empathy serves as a foundation upon which ethical frameworks are constructed, enabling adolescents to navigate complex socio-scientific issues with moral clarity. Moreover, Chawla (1999) emphasized that early experiences with nature, often accompanied by empathetic feelings, are significant predictors of pro-environmental behavior in adulthood. This relationship suggests that fostering environmental empathy during adolescence can have long-lasting impacts on moral development and environmental responsibility.

Ethical reasoning refers to the cognitive process of evaluating right and wrong in each situation. It is inherently tied to values, norms, and principles that guide human conduct. In the context of environmental sustainability,

ethical reasoning involves considering long-term consequences, intergenerational equity, and the rights of non-human entities (Zeidler & Sadler, 2008). Adolescents who are taught to approach environmental issues ethically are more inclined to adopt sustainable lifestyles and advocate for ecological justice. Studies have shown that when ethical reasoning is incorporated into science education, students develop a more nuanced understanding of environmental issues (Sadler, Barab, & Scott, 2007). They learn to weigh multiple viewpoints, assess the credibility of information, and make informed decisions that balance ecological, economic, and social concerns. Ethical reasoning thus acts as a bridge between environmental knowledge and sustainable action. Rest (1986) conducted a study on Ethical reasoning and suggested three components moral sensitivity, moral judgement and moral reasoning has strong role in reasoning in ethical manner. Nucci and Narvaez (2008) argue that moral education integrated with environmental content helps students grapple with complex dilemmas by using reasoning based on fairness, harm, and care. This intersection of ethics and environmental education fosters critical thinking skills and prepares learners to tackle sustainability challenges holistically.

Decision-making is the final behavioral manifestation of one's cognitive and emotional processing, especially in the context of environmental education where learners must navigate complex ecological dilemmas (Hogan, 2002; Garrecht, Bruckermann, & Harms, 2018; UNESCO, 2014). It is a complex process that integrates values, knowledge, and reasoning to select among multiple options. In sustainability contexts, decision-making often involves trade-offs and uncertainties, making it a particularly challenging skill for adolescents to master. Information on sustainability that is grounded in research is necessary for making judgements about sustainable production and consumption. For specific choice problems, there are many environmental sustainability objectives (Dong, Y., & Hauschild, M. Z. (2017)). Making decisions improves in spotting ecological challenges and determining the most critical problems with long-term implications. One of the life skills that aids in preserving nature and natural resources is the ability to take prudent environmental protection acts. Increasing the number of favourable results in environmental education the environmental protection force will inevitably need to make decisions. A wide range of computer-based tools known as decision support tools were created to help make wise decisions, such as mitigating environmental hazards and preparing for effects in various industries and locales (Wong-Parodi, G., Mach, K. J., Jagannathan, K., & Sjoström, K. D., 2020).

Education for Sustainable Development (ESD) emphasizes decision-making as a core competence, aiming to empower learners to take responsible actions in the face of environmental challenges (UNESCO, 2014). Adolescents must be equipped not only with knowledge but also with the skills and dispositions necessary to make thoughtful and ethical environmental decisions. Research has indicated that experiential and interdisciplinary learning approaches enhance adolescents' decision-making capabilities by grounding abstract concepts in real-world contexts (Garrecht, Bruckermann, & Harms, 2018). In line with this, Hogan (2002) highlights the importance of decision-making within science education, suggesting that students exposed to decision-making models based on real environmental problems show increased engagement and deeper learning outcomes. Such models encourage adolescents to consider alternatives, reflect on values, and anticipate the consequences of their actions.

3. Interrelationship Among the Variables

The interplay between environmental empathy, ethical reasoning, and decision-making forms a triadic model essential for fostering environmental sustainability. Empathy serves as the emotional impetus that drives individuals to care. Ethical reasoning provides the cognitive scaffold to evaluate actions. Decision-making operationalizes these values and judgments into tangible behaviors. When adolescents develop environmental empathy, they become emotionally invested in ecological well-being. This emotional investment motivates them to engage in ethical reasoning, where they deliberate on the moral dimensions of environmental issues. This reasoning, in turn, informs their decisions, leading to more sustainable choices. The dynamic interaction among these variables creates a holistic framework for environmental education.

4. Rationale for Focusing on Adolescent Learners

Adolescents represent a critical target group for interventions aimed at fostering sustainable behaviors (Piaget, 1952; Nucci & Narvaez, 2008; Stevenson et al., 2014; Chawla, 1999; Clayton & Myers, 2009). During adolescence, individuals undergo significant cognitive, emotional, and social development. They begin to form abstract thought, question societal norms, and establish personal values (Piaget, 1952). These developmental milestones make adolescents particularly receptive to learning experiences that integrate empathy, ethics, and decision-making'. 'Adolescents are future voters, consumers, and leaders (Kollmuss & Agyeman, 2002; Otto et al., 2019; Ojala, 2015). Their environmental attitudes and behaviors will shape the trajectory of sustainability efforts in the coming decades (UNESCO, 2014; Stevenson et al., 2014; Chawla, 1999)'. By cultivating environmental empathy and ethical reasoning during this formative stage, educators can lay the groundwork for a generation of environmentally responsible citizens. The psychological malleability of adolescents also makes them more susceptible to transformative educational experiences (Stevenson, Peterson, Bondell, Mertig, & Moore, 2014). Integrating empathy-driven and ethically informed curricula at this stage can profoundly influence their worldview, promoting lifelong pro-environmental behavior.

While existing research has explored each of the constructs independently, few studies have examined the integrated influence of environmental empathy on ethical reasoning and decision-making in the context of environmental sustainability. This gap is particularly evident in adolescent populations, where developmental transitions make them both vulnerable and open to influence. Understanding how these variables interact can inform more effective educational strategies, curriculum development, and policy-making. Furthermore, in a global context marked by climate crises, biodiversity collapse, and resource depletion, the need for individuals who can think and act sustainably has never been more urgent. This study aims to contribute to the growing body of literature by providing empirical insights into how environmental empathy can shape ethical reasoning and decision-making, ultimately promoting environmental sustainability.

Research Questions formulated for the present study are,

- Is there any relationship between Environmental empathy, decision making, and ethical reasoning in maintaining environmental sustainability?
- Whether Environmental empathy influences Decision-making and ethical reasoning in the context of environmental sustainability?

5. Objectives of the Study

- To find out the relationship between Environmental Empathy and Ethical Reasoning for Environmental Sustainability among Adolescent learners.
- To find out the relationship between Environmental Empathy and Decision-making for Environmental Sustainability among Adolescent learners.
- To find out whether Environmental Empathy is a significant predictor of Ethical Reasoning for Environmental Sustainability among Adolescent learners.
- To find out whether Environmental Empathy is a significant predictor of Decision-making for Environmental Sustainability among Adolescent learners

6. Methodology

The Investigators adopted normative survey method for the study. The population of the study comprises all adolescent learners across Kerala. A sample of 200 higher secondary school students between the age 15 and 17 drawn from various educational institutions across Thiruvananthapuram district was selected for the present study. The Random sampling technique was used for the study. Environmental Empathy Scale, tests on Ethical reasoning and decision making (Prepared by the investigators) were used for data collection. Three-point rating scale of Environmental Empathy with 30 statements were used for the study. The components of environmental empathy such as Cognitive, Emotional and Compassionate were used to prepare the scale. Test on Ethical reasoning with three components such as Moral sensitivity, Moral judgement, and Moral motivation were used for the study. Total 30 items were used to prepare the test. Test on Decision making with 40 items was used for the study. The decision-making abilities such as collaboration, critical thinking, logic, and active listening were used for preparing the test.

6.1 Statistical Techniques used for the Study

- Correlation analysis
- Regression analysis

6.2 Delimitations of the study

- The present study was delimited to higher secondary school students between the age 15 and 17 in Thiruvananthapuram district.

7. Analysis and Interpretation of Data

The data for the study was collected from a sample of 200 from schools using the Normative Survey Method. It was collected by using appropriate tools and analyzed with proper statistical techniques. The analysis of the data has been presented in the following heads.

7.1 Descriptive Statistics of Environmental Empathy on Ethical Reasoning and Decision-Making among Adolescent Learners

The Descriptive statistics of Environmental Empathy on Ethical Reasoning and Decision-Making Among Adolescent Learners are given in the table 1.

Table 1: Descriptive Statistics for the variable's Environmental Empathy on Ethical Reasoning and Decision-Making Among Adolescent Learners.

Descriptive Statistics	Environmental Empathy	Ethical Reasoning	Decision-Making
N	200	200	200
Mean	96.70	20	27
Standard Deviation	10.90	1.97	6.83
Skewness	0.01	-0.25	-0.52
Std. error of Skewness	0.17	0.17	0.17
Kurtosis	-0.95	-1.09	-0.47
Std. error of Kurtosis	0.34	0.34	0.34

The values of Skewness and Kurtosis of Environmental Empathy on Ethical Reasoning and Decision-Making Among Adolescent Learners shows that all these variables are approximately normally distributed.

7.2 Relationship Between Environmental Empathy and Ethical Reasoning for Environmental Sustainability Among Adolescent Learners

Table 2: Shows the relationship between Environmental Empathy and Ethical Reasoning for Environmental Sustainability among Adolescent learners.

Variables	N	Co-efficient of correlation (r)
Environmental Empathy		
Ethical Reasoning	200	0.787

From table 2, the investigator used Karl Pearson's Coefficient of Correlation (r) to study the intensity of the relationship between Environmental Empathy and Ethical Reasoning for Environmental Sustainability among Adolescent learners. The obtained value of r is 0.787, the calculated $r = 0.787$ and it is significant at the 0.01 level. ($r = 0.787$; $p < 0.01$). Investigator concluded a significant positive relationship between Environmental Empathy and Ethical Reasoning for Environmental Sustainability among Adolescent learners.

7.3 Relationship Between Environmental Empathy and Decision-Making for Environmental Sustainability Among Adolescent Learners

Table 3: Shows the relationship between Environmental Empathy and Decision-making for Environmental Sustainability among Adolescent learners.

Variables	N	Co-efficient of correlation (r)
Environmental Empathy		
Decision-making	200	0.746

From table 3, the investigator used Karl Pearson's Coefficient of Correlation (r) to study the intensity of the relationship between Environmental Empathy and Decision-making for Environmental Sustainability among Adolescent learners. The obtained value of r is 0.746, the calculated $r = 0.746$ and it is significant at the 0.01 level. ($r = 0.746$; $p < 0.01$). Investigator concluded a significant positive relationship between Environmental Empathy and Decision-making for Environmental Sustainability among Adolescent learners.

7.4 To Find Out the Predictability of Environmental Empathy on Ethical Reasoning for Environmental Sustainability Among Adolescent Learners

Table 4: Model summary of Environmental Empathy on Ethical Reasoning Regression Model Summary^b

Model	R	R Square	Change Statistics				df1	df2	Sig. Change	F
			Adjusted Square	R Std. Error of the Estimate	Square Change	F Change				
1	0.787 ^a	0.620	0.618	3.074	0.620	322.49	1	198	0.000	

a. Predictors (Constant): Environmental Empathy

Table 5: ANOVA table for Environmental Empathy on Ethical Reasoning ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3048.269	1	3048.269	322.490	.000 ^a
	Residual	1871.551	198	9.452		
	Total	4919.820	199			

a. Predictors: (Constant), Environmental Empathy

b. Dependent Variable: Ethical Reasoning

Table 6: Regression table for Environmental Empathy on Ethical Reasoning Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(constant)	-14.582	1.940		-7.518	.000
1	Environmental Empathy	0.358	0.020	0.787	17.958	.000

a. Dependent Variable: Ethical Reasoning

From the table 4,5 and 6 it is clear that Environmental Empathy significantly and positively predicts Ethical Reasoning among adolescent learners. The strong correlation ($R = 0.787$) and high coefficient of determination ($R^2 = 0.620$) suggest that 62% of the variation in Ethical Reasoning can be explained by Environmental Empathy. The ANOVA results ($F = 322.490$, $p < 0.001$) confirm that the model is statistically significant. Furthermore, the regression coefficient ($B = 0.358$) and standardized beta ($\beta = 0.787$) show a substantial positive impact, meaning that greater empathy toward the environment is associated with higher ethical reasoning related to environmental sustainability.

7.5 To Find Out the Predictability of Environmental Empathy on Decision-Making for Environmental Sustainability Among Adolescent Learners

Table 7: Model summary of Environmental Empathy on Decision-Making Regression Model Summary^b

Model	R	R Square	Change Statistics				df1	df2	Sig. F Change
			Adjusted Square	R Std. Error of the Estimate	Square Change	F Change			
1	0.746 ^a	0.557	0.554	4.558	0.557	248.515	1	198	0.000

a. Predictors (Constant): Environmental Empathy

Table 8: ANOVA table for Environmental Empathy on Decision-Making ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5164.307	1	5164.307	248.515	0.000 ^a
	Residual	4114.568	198	20.781		
	Total	9278.875	199			

a. Predictors: (Constant), Environmental Empathy

b. Dependent Variable: Decision-Making

Table 9: Regression table for Environmental Empathy on Decision-Making Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1	(constant)	-18.026	2.876	-6.268	0.000
	Environmental Empathy	0.466	0.030	0.746	15.764

a. Dependent Variable: Decision-Making

Table 7,8 and 9 reveals that Environmental Empathy is a significant and strong predictor of Decision-Making for environmental sustainability among adolescent learners. The model shows a high correlation ($R = 0.746$) and an R Square value of 0.557, indicating that approximately 55.7% of the variance in Decision-Making is explained by Environmental Empathy. The ANOVA table confirms the statistical significance of the model ($F = 248.515$, $p < 0.001$). The regression coefficient ($B = 0.466$) and standardized beta value ($\beta = 0.746$) indicate a substantial positive influence, suggesting that an increase in environmental empathy is associated with improved decision-making ability.

8. Findings of the Study

- A significant positive relationship was found between Environmental Empathy and Ethical Reasoning ($r = 0.787$; $p < 0.01$), indicating that adolescents with higher environmental empathy tend to show stronger ethical reasoning.
- A significant positive relationship was also observed between Environmental Empathy and Decision-Making ($r = 0.746$; $p < 0.01$), suggesting that greater empathy toward the environment enhances responsible decision-making in adolescents.

8.1 Related to Environmental Empathy and Ethical Reasoning

- A strong positive correlation was found between Environmental Empathy and Ethical Reasoning ($R = 0.787$).
- Environmental Empathy accounted for 62% of the variance in Ethical Reasoning ($R^2 = 0.620$).
- The adjusted R^2 value was 0.618, confirming the model's reliability.
- The regression model was statistically significant ($F = 322.490$, $p < 0.001$).
- The unstandardized coefficient ($B = 0.358$) indicates that Ethical Reasoning increases by 0.358 units for every one-unit increase in Environmental Empathy.
- The standardized beta coefficient ($\beta = 0.787$) shows a strong predictive influence.

8.2 Related to Environmental Empathy and Decision-Making

- A strong positive correlation was observed between Environmental Empathy and Decision-Making ($R = 0.746$).
- Environmental Empathy explained 55.7% of the variance in Decision-Making ($R^2 = 0.557$).
- The adjusted R^2 was 0.554, indicating a good model fit.
- The regression model was statistically significant ($F = 248.515$, $p < 0.001$).
- The unstandardized coefficient ($B = 0.466$) suggests that Decision-Making increases by 0.466 units with every one-unit rise in Environmental Empathy.
- The standardized beta coefficient ($\beta = 0.746$) confirms a substantial influence.

9. Educational Implications

- The strong positive relationships observed between Environmental Empathy and both Ethical Reasoning and Decision-Making shows the importance of integrating empathy-driven environmental education in the school curriculum.
- The findings suggest that when adolescents are motivated to emotionally connect with environment and its challenges deepens their concern towards the nature and, also enhances their ability to reason ethically and make relevant decisions.
- The aim of educational programs is to cultivate environmental empathy through experiential learning, like nature-based activities, community clean-up drives, sustainability projects, and real-life case studies on environmental justice.
- The development of critical and ethical thought may be promoted by incorporating environmental issues into moral and value education.
- Teachers can contribute to significant impacts by demonstrating empathy in class discussions and encouraging students to think about environmental concerns from an array of perspectives, primarily those of future generations and marginalized individuals.

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Conflict of Interest

There is no conflict of interest to declare for this paper.

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