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Study the relationship between environmental knowledge and environmental values using environmental education

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Abstract

In recent years, the issue of global warming has garnered worldwide attention. Promoting environmental education is essential in improving human-environmental literacy and resolving global environmental problems. Increasing emphasis has been made on environmental education and environmental concerns in management education to change people's attitudes toward the environment by enhancing their environmental knowledge and environmental value. In this scenario, individuals would naturally focus on environmental concerns, adopt environmentally beneficial behaviors, i.e., responsible environmental behaviors, and foster the habit of protecting the environment, especially among the next generation's environmental knowledge. A total of 370 questionnaires are randomly delivered to students at the Central University of Finance and Economics, with a retrieval rate of 290 valid questionnaires of 90%. The relationships between environmental education and environmental knowledge, environmental knowledge and environmental value, and environmental education and environmental value are strong and beneficial, according to the findings of this study. Environmental education is expected to have an impact on people's environmental knowledge and environmental value, and it is expected that environmental units would identify particular strategies to increase citizens' environmentally responsible actions based on these outcomes.

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Introduction

Most ethnic groups used to have "infinite" views and attitudes towards nature and the environment, but this is no longer the case. Humans could survive, live, and even enjoy themselves in such an "inexhaustible" environment since they did not understand where it came from. People had to adapt to an unfamiliar natural world (Ardoin 2020). When humans had no knowledge or technology, they depended on the natural environment to survive and live. The concept of relying on "God" as a source of life and survival grew more prevalent. The inaugural Earth Day served as a reminder that human actions were threatening the existence of both humans and other animals on the planet. As a result, the general public, particularly consumers and nations with sophisticated economies, were aware of shifts in production and consumption patterns. As a result of individuals seeking personal safety, comfort, prestige, power, time savings, and pleasure, environmental concerns have arisen as a direct result of poor human conduct (Shrivastava *et al.*, 2020). "As a result of this, some behavior lists began proposing different technologies to correct human conduct and safeguard the environment."

Contribution to the knowledge base of this article

In-service "teachers' abilities to do environmental education research and development should be cultivated via training and studies at environmental education teacher training institutes, which should focus on course planning, design, and integration." Teachers should be encouraged to see the possibilities, affirmed in their efforts, and rekindled in their enthusiasm for environmental education while promoting environmental education. Teachers will not give up on their goals despite the lack of financial compensation. Students should be encouraged to express their views on a variety of environmental issues "and guided to engage in more in-depth discussions about various types of environmental knowledge and value to better clarify and construct environmental value through comparison and criticism in their minds." This is especially important in environmental education. Environmental education or environmental concerns in management education have become more critical in recent years. Likewise, consumers are placing greater emphasis on the potential environmental effect of their purchasing choices. A lot of work has been done by the government and the public sector to advance environmental education to change attitudes and increase residents' environmental awareness and appreciation for the environment (Posner and Cvitanovic 2019). Environmental concerns, "as well as responsible environmental behaviors, such as environmental awareness and the environmental protection habit of the next generation, would naturally be emphasized by people." Environmentally friendly items are becoming increasingly common, yet actual usage is riddled with inconsistencies, contradictions, and ambiguity (Jiang *et al.*, 2018). Do you think that if you promoted environmental education, more people would adopt environmentally-friendly habits? Real-world evidence shows that the environment is deteriorating, and environmental incidents are regularly occurring, although individuals seldom assume environmentally responsible actions (Dewulf *et al.*, 2020). Therefore, "the research aims to investigate how environmental education impacts people's environmental knowledge and environmental values, and how environmental units might discover unique strategies to encourage citizens to engage in environmentally responsible conduct."

Literature and Hypothesis

Environmental Education

They argued that environmental education should focus on teaching people about the "interrelationship between their aspirations and needs and the environment, as well as correcting and reflecting people's attitudes about and value for the natural world." "According to (Varela-Candamio *et al.*, 2018), the goal of environmental education is not simply to gain an objective understanding of nature; rather, it is to gain an objective understanding of the relationship between subjective human desires and the environment and the ability to self-regulate and self-reflect the permanent relationship between human survival and the natural environment." Science and humanity, "as well as the philosophy of knowledge

between the natural environment, natural norms, and natural law," should be included in every educational material, according to (Maurer and Bogner, 2020). According to (Tong *et al.*, 2020), it is not enough to have a scientific understanding of the objective environment and the techniques for dealing with environmental issues. (Tong and colleagues) Future environmental education will have to deal with the importance of human self-awareness and self-reflectiveness and the importance of natural law's balance, limitation, extreme, and relativeness (Turrini *et al.*, 2018). In the view of (Cincera *et al.*, 2018), environmental education refers to how people get a better awareness of the environment and develop more positive attitudes about it. However, it had no personal freedom of choice in certain respects. It was a matter of national need and compulsion; in other words, it was a matter of universal acceptance. "There were no individual interests or needs in mind when it came to the content and requirements, but rather, they were designed to educate and mold a person's understanding of the world or the planet' s natural environment." "(Chuvieco *et al.*, 2018) (Lehtonen *et al.*, 2018) said that environmental education was mandatory and that its content was distinct from general scientific, skill, or general knowledge education in that it emphasized human commonality."

This research proposes the following aspects of environmental education:

1. Nature as a system, the planet as a whole as well as the biosphere.
2. Earth resources: the distribution, usage, management, conservation, and pollution of natural resources.
3. To develop environmental value, laws should be put in place for humans as a component of the ecosystem.

Environmental Knowledge

Consumers' environmental behavior isn't primarily influenced by their environmental awareness (Wang *et al.*, 2018); however, a few researchers disagree. According to their findings, people with a better understanding of the environment were more likely to make environmentally friendly purchases. As a result, people who bought organic food once a week had a better experience of environmental goods than those who bought organic food less often. Customers "with strong environmental awareness are more likely to purchase beverages with environmentally friendly packaging," according to a study (Maravilhas and Martins 2019) on consumer beverage preferences. Environmental awareness was necessary to engage in environmental-friendly actions (O'Donnell *et al.*, 2018). In addition, a lack of environmental understanding would limit environmentally friendly conduct. Environmental studies were considered an interdisciplinary field, "drawing on insights from the natural and human sciences and the social sciences and anthropology." This may occasionally extend to questions of morality, particularly in the distribution of value and power. Environmental knowledge might be defined as knowledge about living organisms and their surroundings.

The following cognitive aspects of environmental knowledge are addressed in this investigation:

1. General knowledge includes knowledge of the complete environment, such as the history and ecology of the natural environment, the history and ecology of the social environment, and human ecology.
2. Environmental challenges created by misuse of natural resources and the ability to keep resources under check.
3. Environmental action knowledge, problem-solving abilities, and environmental action knowledge all fall under the umbrella term of action knowledge.

Environmental Value

When we talk about environmental value, we're referring to "human beliefs, attitudes, and values toward the environment to drive and govern human environmental behavior" (Martins *et al.*, 2019). The environmental value was based on an individual's perception of the natural environment's intrinsic worth. "Each person's intrinsic worth in the environment would influence their attitudes and

intrinsic drive to the environment, and this would constitute the environmental paradigm." While universal value may impact the environment, it can also influence the conduct of people concerned about the environment (de Lange *et al.*, 2019).

In other words, attitudes are affected by one's values, which shape one's environmental behavior. Several elements went into determining value, including social ones (such as friends and neighbors) as well as ecological ones (such as the media and political groups) (culture, religion). According to certain studies, environmental conservation is a higher priority for collectives than individuals (Zhang *et al.*, 2019). "The value-belief-norm (VBN) model was created to explain the emergence of environmentally responsible behavior by researchers who found that value was detrimental to environmental conservation." "Considered environmental value to be the particular conditions in the environment, the general environment, and the belief makeup of those involved in the environment." An environmental attitude is often defined as a person's or a group's actions in response to their perceptions of the environment and their emotions and motivations. It has been proposed that environmental value is defined as "individual opinions about environmental value in its entirety, as well as human responsibility and role in the environment," according to (Latulippe and Klenk, 2020). Environmental value can manifest as an emotional preference for pro or con, liking or disliking environmental issues. According to this research, the environmental value has the following dimensions:

1. The first component of cognition is the ability to comprehend and evaluate one's surroundings.
2. Like/dislike feelings toward the surrounding environment, with an emotional inclination as one of the components.
3. Component of behavior: A person's proclivity to adapt to their surroundings.

Ecological Education and Environmental Knowledge: A Correlational Study

They pointed out that education's ultimate goal is to modify people's behavior. According to the "knowledge-attitude-behavior" paradigm, an increase in environmental knowledge may lead to a shift in one's attitude toward the environment and a subsequent rise in environmentally-responsible conduct. For this reason, environmental education was focused on cultivating and enhancing individual and group environmental understanding. According to (Abbas and Sasan, 2019), "the process of environmental education aims to improve environmental problems by teaching people about the relationship between humans and nature and the importance of developing basic concepts to understand the interrelationships between culture, creatures, and the physical environment." According to them, environmental education has become a worldwide trend. Educating the public on environmental issues may help them better comprehend their place in the natural world and how their actions impact it, as well as help them prepare logically or provide environmental knowledge for future sequential management (Brezovszky *et al.*, 2019). Because of this, the researchers in this study have come up with the following theory.

E1: Knowledge of the environment is linked to environmental education.

Ecological Education and the Value of the Environment

They brought out the links between students' understanding of the environment and their value for the environment. According to a study, students who performed better on environmental knowledge tests were found to be more concerned about environmental issues (Guo *et al.*, 2020).

According to a study, environmental knowledge and value among elementary school kids were found to be of a high level and to have a favorable impact on students' attitudes toward environmental issues. "It was noted that a single variable set could not predict environmental behaviors; it seems that environmental elements are complex." (Dlouhá and Pospilová, 2018) People must better grasp how the environment affects them and how they can better forecast and address environmental issues by

enhancing their fundamental understanding of how the environment affects them and better understanding how the environment impacts them. As a result, environmental cognition is suggested to improve environmental value in this research. As a result, the following theory is put out in this investigation:

E 2: Knowledge of environmental issues has a strong link to a person's sense of environmental responsibility.

Environmental Education and the Value of the Environment: A Correlation Study

In environmental education, they emphasized the significance of understanding students' environmental values. According to environmental education studies, it is critical to instill favorable environmental attitudes and values in pupils to successfully implement environmental education. "Environmental education also taught individuals how to make choices when confronted with environmental quality challenges and how to create self-behavioral environmental value, according to (Murillo-Zamorano *et al.*, 2019)."

They stressed the need to instill an excellent environmental value in kids as part of their education, as this would aid in the resolution of environmental issues and the improvement of environmental quality (Panda *et al.*, 2020). Environmental education, they said, directed and taught people how-to live-in harmony with nature. "Deep environmental education refers to ecological philosophy, environmental ethics, and environmentally responsible value from an ecological standpoint." "They saw environmental education as integrated education, rather than teaching to specific age groups or groups of people; it emphasized universality, lifelong learning, and integrity, as well as integration of politics, economics, society, culture, and aesthetics, and was a type of value and lifestyle (Malanchini *et al.*, 2020)." As a consequence, this research proposes the following theory.

E 3: Environmental education uncovers significant links between environmental value and education.

Research method and model

When evaluating the "LISREL model's" "overall model fit (i.e., the model's external quality)," it is typical to compare it to "the model's internal quality." "In terms of overall model fit, the commonly used goodness-of-fit indicators" include (1) "2 ratio (Chi-Square ratio)," "representing the gap between the theoretical model and expected value," "which is better smaller than 3," "(2) goodness of fit index (GFI) and adjusted goodness of fit index (AGFI)," "which is better close to 1," "and (3) root mean square residual (RMR), reflecting the square root of residual variance/covariance mean, which is better smaller than 3. The internal structure model is frequently used in LISREL," "which includes (1) square multiple correlations (SMC) of individual manifest variable, as R2 of manifest variable and latent variable, which should be higher than 0.6." "(2) component reliability of latent variable, as the Cronbach's of the observation indicators of latent variables, which should be higher than 0.7." And (3) average variance extracted of the latent variable, which is calculated with the R2 sum of ma.

Research Sample and Object

Aiming at students of Central University of Finance and Economics, 370 copies of the questionnaire are randomly dispersed, and 290 valid copies are recovered, with the retrieval rate 90 percent." (Martínez-Martínez *et al.*, 2019) "Central University of Finance and Economics is one of the national 220 major institutions to which the Chinese central government has placed great attention.

Reliability and Validity Test

"Validity refers to the ability of a measuring scale to genuinely measure the degree that a researcher wishes to assess" (Bouman *et al.*, 2020). Among the three types of legal validity are "content validity," "which is geared toward qualitative verification," "criterion validity," "which involves using an established external standard and a correlation coefficient in the evaluation process," and "construct validity," "which assesses the measurement's theoretical consistency with other variables that can

be observed (Liu *et al*.,2018).” In this research, “the questionnaire content is based on previous theories and based on the actual situation to develop the measuring instrument, which could genuinely convey the essence of affairs and full representativeness, to assure the questionnaire conforms to content validity” (Van der Molen, 2018).

This questionnaire's construct validity is also tested using the final commonality estimate of the Factor Analysis result, and the validity is found to be between 0.9 to 0.10.

Evaluation of the Empirical Findings

Model Fit Test

Thanks to an estimate based on "maximum likelihood" (ML), the analysis's results are converging. “Table 1 shows high external model quality in terms of overall model fit metrics.”

Table 1. The outcome of a model's analysis.

	“Evaluation indicator”	“Judgment standard”	“Result”
Overall goodness fit	“p –value”	“p -value > 0.06”	.1
	“χ2/d.f.”	< 4	2.762
	“GFI”	> .10	.887
	“AGFI”	> .10	.816
	“CFI”	> .10	.873
	“RMR”	“< 0.06, excellent to be < 0.026”	.123
	“RMSEA”	“0.06~0.10 good excellent to be < 0.06”	.431
	“NFI”	> .10	.838
	“IFI”	> .10	.822

Test for Path Relationships

A high SMC of manifest variables (Table 2, 3) indicates appropriate measuring indicators for latent variables for the model's internal quality test. “As shown in Table 4, the average variance extracted from dimensions is greater than 0.6, apparently meeting the test requirement for fit to the internal structure model, and latent variables measuring environmental knowledge, education, and environmental value all show component reliability greater than 0.6.”

Table 2. Inverse SMC of the dimensional variable.

	Environmental knowledge	
General knowledge	“Problem knowledge”	“Action knowledge”
.83	.87	.82

Table 3. Inverse SMC of dimensions and variables.

“Environmental education”				“Environmental value”	
“Natural system”	“Earth resources”	“Human” “Environment”	“Cognitive” “Component”	“Affective” “Component”	“Behavioral” “Component”
.86	.82	.87	.78	.80	.83

Table 4. Average variance of the components and their component dependability are calculated.

Item	Environmental knowledge	Environmental education	Environmental value
“Component reliability”	.838	.867	.892
“Average variance” “extracted."	.84	.86	.90

It appears that “The model analysis result supports B1, B2, and B3, Table 5, which shows a positive and notable correlation (0.885) between environmental education and environmental knowledge, as well as a positive and notable correlation (0.846) between environmental education and environmental value.” Table 6 shows the hypothesis test for the study project.

Table 5. “Structural examination of linear relationships”.

Evaluation item	Parameter/evaluation standard	Result	T
Internal fit	“environmental education→environmental knowledge”	.885	38.48**
	“environmental knowledge→environmental value”	.877	27.84**
	“environmental education→environmental value”	.846	22.57**

Table 6. “Hypothesis test”.

“Research hypothesis”	“Correlations”	“Empirical result”	“P”	“Result”
B1	+	.885	.1	“Supported”
B2	+	.877	.1	“Supported”
B3	+	.846	.1	“Supported”

Conclusion

Research shows that environmental education is essential for students to know and understand objective and tangible facts and phenomena about the environment, to realize how to deal with, solve or prevent environmental damage or worsening, to understand the essence of the tangible natural environment, the unchanged abstract rules behind the natural environment, and to status and role in the natural environment, as well as multi People's ability

to coexist peacefully with the natural world without harming it is the primary goal of environmental education, as well as the ultimate goal and pursuit. “Kids spend nearly a third of their day at schools, so campuses naturally become their primary learning environment.” Educators and administrators who can make the most of their available resources by carefully planning their students' physical and mental development while also teaching them about environmental issues and the importance of environmental stewardship can ensure that their classes have the greatest possible educational impact.

Suggestion

This study's practical recommendations are aimed at the study's significant research outcomes and conclusions. Environmental education teacher trainers need to conduct training and studies related to the design of environmental education courses, the development of in-service teachers' research and development skills, and the creation of environmental education integration ideas. Encouraging the potential and affirming the efforts of instructors who are passionate about “environmental education is essential in promoting environmental education.” Teachers would not abandon their goals if they were not financially compensated for their efforts. To inspire instructors to commit themselves to the classroom, schools should develop a positive and supportive atmosphere and give timely spiritual and material rewards. “Environmental education instructors, on the other hand, should be allowed to introduce themselves on stage and be moved by the progress they have made. Students should be encouraged to express their views on a variety of environmental issues and guided to engage in more in-depth discussions about various types of environmental knowledge and value to better clarify and construct environmental value through comparison and criticism in the educational process.” Expanding and reacting to environmental concerns in the classroom might help students better understand their learning material. Keeping a daily journal allows students to document their thoughts and feelings about environmental issues while also providing a platform for their expression. Value sheets and diaries may help teachers better understand their students' environmental knowledge and values to give direction and affirmation to those pupils.

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