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School children's attitudes toward green education: Validity and reliability of the revised 2-MEV scale in West Bengal, India

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Abstract

Schools are strongly encouraged to transition from traditional didactic teaching methods to smart education to enhance the overall learning experience for students. Over the past 40 years, technological advancements have led to significant breakthroughs in learning. One important initiative, known as green schooling, plays a crucial role in promoting sustainable development by equipping individuals with the necessary knowledge, skills, values, and perspectives to tackle environmental challenges and strive for a more sustainable future. So, here, the attitudes of school children towards green education (GE) are explored by examining environmental utilization (UT) and preservation (PR). This present study aimed to test the validity and reliability of the Revised 2-MEV Scale of Johnson & Manoli (2010) in the Indian context. With a sample size of 222 secondary students from West Bengal, India, this study followed descriptive statistics such as Mean, Median, and Test of normality, Kaiser-Meyer-Olkin (KMO) Test, Bartlett's Test of Sphericity (BTS), Confirmatory Factor Analysis (CFA) and Cronbach's Alpha using AMOS v21 and SPSS v23. The original scale with 16 items across two constructs was retained throughout the stringent validation process and resulted in a high-reliability score proving it apt for future usage to measure 16-18-year-old students' attitudes towards green education. The analysis of responses concerning Environmental UT and PR was two key dimensions, supported by sub-factors. The Goodness of Fit index (GoF) (CMIN/DF=1.654) confirms the appropriateness of the model. The revised 2 MEV scale is a valuable and reliable tool for assessing students' attitudes toward green education (GE) in West Bengal, India. Researchers, academics, and policymakers may use the scale to understand the attitude of 16-18 aged children towards green education. Stakeholders can utilize this scale to find existing gaps in understanding, raise awareness about environmental issues, and improve the quality of GE training.

Introduction

People are becoming increasingly aware of environmental issues due to the global ecological crisis, which encompasses climate change (Randler et al., 2024). A green school promotes environmentally conscious attitudes and behaviors among students and the school community, encouraging them to integrate these habits into their daily lives, both on campus and at home (Hidayat et al., 2023). The mainstream educational institutions in the post-COVID-19 era are increasingly recognizing the importance of nature-based and environmentally friendly pedagogical and curricular infrastructures (Dey, 2022, p. 16). The urgency of addressing environmental issues such as climate change, various forms of pollution, and resource depletion is becoming increasingly evident. A report by the Intergovernmental Panel on Climate Change (IPCC) highlights the need for immediate and sustained large-scale actions to tackle our global challenges (IPCC, 2021). According to Gough (2013) and Sterling and Orr (2001), green education (GE) plays a crucial role in this effort by equipping individuals with the knowledge and skills necessary to address environmental problems while promoting sustainable development. This study validated the revised scale of the attitudes of school children toward GE concerning Environmental UT and PR. GE aims to integrate environmental themes into school curricula, promoting student engagement in conservation efforts and instilling a sense of responsibility from a young age (Tilbury, 1995). According to Kollmuss and Agyeman (2002), early exposure to environmental education is essential, as it influences attitudes and behaviors that contribute to lifelong environmental sustainability. Children, who are in the process of developing their beliefs and behaviors, are ideal candidates for educational initiatives that promote environmental stewardship. Research by Constantin et al. (2024), indicates that GE programs in schools can effectively foster social responsibility, environmental awareness, and sustainable habits among students, positively influencing their views on environmental preservation and sustainability. A study conducted among students at senior secondary government schools in Indore, India, revealed diverse opinions on the teaching of green skills. Despite a low mean score and a high standard deviation, students were applying the green concepts they learned in vocational courses (Mahapatra & Ravichandran, 2023). Additionally, Choudhury (2014) found that secondary school students generally exhibited a positive attitude toward environmental conservation, highlighting the significance of fostering informed decision-makers and active participants through dedicated Green Education initiatives.

According to Llopiz-Guerra et al. (2024), GE programs in schools can significantly influence students' attitudes toward sustainability and environmental conservation. Most psychologists assume a framework of cognitive (i.e., facts, knowledge, or understanding), affective (emotion and feeling), and conative (action and behavior) components for the theoretical construct of attitude (e.g., Fishbein & Ajzen, 1974; Gray et al., 1985). According to Dunlap and Jones (2002) more focused on environmental concerns with Variables of socio-psychological. According to Schultz et al. (2004), a person's environmental attitude is made up of their beliefs, feelings, and behavioral intentions about topics or activities that have an impact on the environment. Bogner and Wiseman, (1999; 2002a; 2002b) established a scale for the entire European on UT and PR factors for ecological attitudes. Based on environmental/ecological attitude theory sets in two orthogonal (uncorrelated) factors- UR and PR (Wiseman & Bogner, 2003). According to Wiseman and Bogner (2003), an individual's position on two orthogonal dimensions associated with natural resources shapes their ecological values. Scale validation is important in this situation because, even though this scale has been used in many countries in various age groups, the researcher could not find a 2-MEV scale in the Indian setting. The researcher provided more evidence in the review section. Questionnaires are essential for identifying behavioral patterns and tracking attitude changes over time or across demographic groups (Randler et al., 2024). Our younger generation has a significant responsibility to promote and achieve the Sustainable Development Goals (SDGs), especially in the era of social media, where digital issues often take precedence over environmental concerns. The present study aims to establish the validity and reliability of the Revised 2-MEV (2-Major Environmental Values) Scale to investigate attitudes toward GE in the context of West Bengal, India.

Review of literature (RL)

According to Yadav et al. (2021), environmental issues have become more prevalent and severe because of growing industrial and human impacts on the environment. Güngör et al. (2022) reported that schoolchildren's awareness of the ecological footprint concept was primarily at a medium level (51.5%). According to research, environmental knowledge and attitudes begin to develop in early childhood, and positive attitudes and behavior toward the environment are significantly influenced by the environmental awareness acquired during this time (Ardoin & Bowers, 2020; Spiteri, 2020; Perez-Lopez et al., 2021). Environmental attitude depends on conservation behavior and environmental awareness. Environmental challenges, such as water poisoning and climate change, have received more attention since the United Nations 2015 released Agenda 2030 and its 17 Sustainable Development Goals (SDG) (Samejo et al., 2023; Borg et al., 2017). Fayyaz et al. (2023) stated that students should be aware of the importance of conserving the environment. Over time, there have been different questionnaires or scales developed globally to find environmental attitudes (Randler et al., 2024). Numerous scales are now in use to measure concepts that appear to be connected, but there needs to be more confirmation research (Bogner & Wiseman, 2006). Presently measuring environmental attitude (EA) is essential, but there are significant issues related to the absence of standardized measurement instruments (Randler et al., 2024; Hines et al., 1987, Dwyer et al., 2016). Here, a researcher adds on the strongly validated scales in RL like, Dunlap et al. (2000) used scales, including the New Ecological Paradigm (NEP) through the 2-MEV model for adolescents. Here, utilization is an anthropocentric dimension, that represents the use of natural resources, preservation, is a biocentric dimension that represents environmental preservation and conservation (Wiseman & Bogner, 2003; Kibbe et al., 2014). Preservation

stands for willingness to preserve the environment, and it is typically used to identify the selfless domain (Kibbe et al., 2014). Bogner and Wilhelm established the Environmental Scale, 2-MEV model, which consists of 69 items that can be used to measure environmental concern and actual behavior toward the environment (Bogner & Wilhelm, 1996; Johnson & Manoli, 2010). For the German-speaking populations, Bogner and Wiseman (1999) again developed a 2-MEV model to measure EA. Bogner and Wiseman (2006) validated the first version which was conducted with 11–18-year-old secondary school students with the help of good agreement with a model that included two higher-order factors, UTL (utilization) and PRE (preservation), along with the two fundamental variables (Bogner & Wiseman, 2006; Binngießer & Randler, 2015). A high preservation factor score suggests that the individual values the conservation and protection of ecological resources, implying an ecocentric attitude. PRE measures three primary factors: Intent of Support, Care with Resources, and Enjoyment of Nature and UTL consists of Human Dominance over Nature and Altering Nature (Randler et al., 2024). According to Randler et al. (2024)'s study to find out, in widespread validity across continents, more than 30 languages, and numerous countries, the 2-MEV model is robust across regions and cultures, including Tanzania (Nkaizirwa et al., 2022), New Zealand (Milfont & Duckitt, 2004), the USA (Johnson & Manoli, 2010), and Europe (Boeve-de Pauw & Van Petegem, 2018; Le Hebel et al., 2014). The present study also followed the same primary factor for preservation (PR) and utilization (UT) due to strong theoretical and empirical evidence. However, it is unavailable in the Indian setting, creating a research deficit for this kind of work as well. Several studies indicate 9-12 years old adolescents and expanded it to youths for the validity of this scale (Munoz et al., 2009; Oerke & Bogner, 2010; Johnson & Manoli, 2010; Schumm & Bogner, 2016; Schneiderhan-Opel & Bogner, 2020; de Almeida Barbosa et al., 2021; Randler et al., 2024).

All this evidence can be said to support that the 2-MEV model is suitable for measuring EA across this age group and verifying that it is culturally invariant. Therefore, the purpose of this study is to establish the validity and reliability of the Revised 2-MEV Scale to investigate attitudes of students in West Bengal, India, toward GE.

Inadequate scale of measurement for attitude in green education in India

Kapoor et al. (2021) stated that the goal of green education is to instil in learners an awareness of the environment, sustainability, and eco-friendly behavior. As such, a reliable assessment method that appropriately represents these views is needed. In India, measuring attitudes toward green education is becoming progressively important. However, the inadequate scales now in use make it difficult to fully capture the richness and multidimensionality of environmental attitudes. According to Sharma and Sharma (2023), validated scales frequently draw on Western-developed constructs that may not be entirely appropriate in the Indian context due to the country's unique cultural, social, and environmental elements that influence attitudes toward green education. Inadequate measures not only impede but also weaken efforts to customize educational interventions that can promote significant environmental change when we attempt to assess the efficacy of green education initiatives using Western standards (Sharma & Rao, 2024). While significant affective and behavioral components of environmental attitudes should not be disregarded, current measurement instruments frequently concentrate on cognitive dimensions of attitudes toward the environment, such as awareness and knowledge. Therefore, a thorough understanding of environmental attitudes necessitates the integration of these components, which are influenced by social values, cultural norms, and personal experiences (Grosseck et al., 2019). Despite the drawbacks, there are still issues in the field of green education research, particularly about attitude toward GE, with the availability of clear definitions and reliable measurement instruments in the present context. In the RL section, the researcher did not find any valid scale in the present study area. These obstacles make it challenging to investigate the prevalence of this type of disordered behavior, which in turn impedes crucial advancements in the field of addiction research (Choudhury et al., 2024). According to Kapoor et al. (2021), to assure environmental stewardship and sustainable development, it is critical to address the inadequateness of measurement scales in today's educational programs and green education advancements.

> Objective 1. To validity and reliability of the Revised 2-MEV Scale of Johnson, B., & Manoli, C. C. (2010) in the Indian context.

Methodology

The Comprehensive Model of Scale Development model was covered in the scale development process using a rigorous empirical method; see Kundu et al. (2024, p. 709). The researcher used purposive sampling to select 222 students from different higher secondary schools in West Bengal, India. The data were collected in rural and urban areas distributed throughout Western (Birbhum, Purulia, Bankura) and Southern part (South 24 Parganas) West Bengal, India. Collection of demographic data beyond the pupils' area (51.35% Rural and 48.65% Urban) and gender (46.4% Male and 53.6% Female) (Bogner & Wiseman, 2006). The data collection lasted for four months between April-July, 2024 and is prevented by all regulations. According to Tinsley and Tinsley (1987), a sample size of approximately 270, or 5-10 subjects per item, is recommended for factor analysis. Following this recommendation, a 16-item questionnaire was administered to 160 consenting participants who met these criteria. Additionally, DeVellis and Thorpe (2021) noted that a larger sample size is preferable for creating scales, as it helps reduce subject variability. Therefore, this sample size was considered acceptable and indicative of the study's significance. The questionnaires were distributed during regular school hours and completed in class using Google Forms for the higher secondary students. Data were gathered from a single questionnaire featuring a 5-point Likert scale, where responses ranged from "strongly agree" (1 point) to "strongly disagree" (5 points), with an undecided option included (Likert, 1932).

Inclusion and exclusion criteria

To ensure the study's relevance, 222 participants were carefully selected based on specific inclusion and exclusion criteria. The inclusion criteria required participants to be students in 11th and 12th grades attending government and private schools, with a requirement for regular school attendance. The exclusion criteria disqualified those who did not complete the questionnaire fully or filled it out incorrectly.

Statistical analysis

SPSS v.23 was used for all other statistical analyses. All participants who had data for the specified variables were kept in case of missing data. The researcher first used the Kaiser-Meyer-Olkin (KMO) test and Bartlett's Test of Sphericity (BTS) (Field, 2013) to begin data analysis. According to Hutcheson and Sofroniou (1999), testing the sampling adequacy whereas the latter tests the hypothesis that the correlation matrix implies (Tabachnick & Fidell, 1996). We performed an Exploratory Factor Analysis (EFA) with principal component extraction and varimax rotation to analyze this sample statistically (Thompson, 2004). An exploratory factor analysis was employed to establish the validity of the scale (Bhandarkar, 2009). The number of factors was determined by the author using two main criteria: a parallel analysis based on 16 variables (items) and 110 participants, and a reliability analysis using Cronbach's α. Items taken from the 2-MEV Scale (Johnson & Manoli, 2010) are enclosed in double quotes to address concerns about plagiarism, and the researcher did not reword any sentences because they were originally expressed. The parallel analysis was based on the scree plot and the eigenvalue greater than one criterion. To check whether the factor structure produced by the EFA procedure was compatible with the data, it was then examined again using Confirmatory Factor Analysis (CFA) on the second sample (n= 112).

Results and discussion

Exploratory factor analysis and scale optimization

Exploratory Factor Analysis (EFA) provided insights into patterns regarding the 2-MEV scale. As noted by Tabachnick and Fidell (1996), the dataset demonstrated a KMO measure of 0.751, indicating acceptable sampling adequacy for the analysis. Furthermore, a stronger KMO value of over 0.7 was observed for the 16 total items in Table 4, suggesting a high level of association between the factors and the items (Hair et al., 2010). Bartlett's Test of Sphericity (Table 2) yielded a significant result ($\chi 2 = 3819.657$, $p < 0.001$), further confirming the factorability of the data, as proposed by Field (2018). According to Guttman's rule and an examination of the scree plot (Figure 1) (Guttman, 1954), meaningful factors with eigenvalues greater than 1 were identified; however, no distinct factors were ultimately found (Kundu et al., 2024).

In Table 3, we present the factor loadings (λ), the exploratory factor analysis (EFA) results for the rotated component matrix, and the correlations between the five sub-factors

Table 1. The Original 16 item 2-MEV Scale (Johnson & Manoli, 2010).

PRESERVATION (PR)	
(Intent of support)	
1PIS	"If I ever have extra money, I will give some to help protect nature". (Johnson & Manoli, 2010; Baierl et al., 2021; Bogner & Wiseman, 1997; Randler et al., 2024)
2PIS	"I would help raise money to protect nature." (Johnson & Manoli, 2010; Randler et al., 2024)
3PIS	"I try to tell others that nature is important." (Johnson & Manoli, 2010; Randler et al., 2024)
Care with Resources	
1PCR	"To save energy in the winter, I make sure the heat in my room is not on too high." (Randler et al., 2024)
2PCR	"I always turn off the light when I do not need it anymore." (Randler et al., 2024)
3PCR	"I try to save water by taking shorter showers or by turning off the water when I brush my teeth." (Randler et al., 2024; Bogner & Wiseman, 2006; Bogner & Wiseman, 2004; Baierl et al., 2022; Bogner & Wiseman, 1997; Bogner & Wiseman, 2002; Schneiderhan-Opel & Bogner, 2021a; Schneiderhan-Opel & Bogner, 2021b; Raab & Bogner, 2021).
Enjoyment of nature	
1PEN	"I would like to sit by a pond and watch different trees." (Randler et al., 2024; Bogner & Wiseman, 2006; Bogner & Wiseman, 2004; Johnson & Manoli, 2010; Bogner & Wiseman, 1997; Bogner & Wiseman, 2002; Schneiderhan-Opel & Bogner, 2021a; Schneiderhan-Opel & Bogner, 2021b)
2PEN	"I like to go on trips to places like forests away from cities." (Randler et al., 2024)
3PEN	"I like the quiet of nature." (Randler et al., 2024; Bogner & Wiseman, 2004; Bogner & Wiseman, 1997; Bogner & Wiseman, 2002; Randler et al., 2024)
UTILIZATION (UT)	
(Altering nature)	
1UAN	"People have the right to change the environment (nature)." (Randler et al., 2024; Bogner & Wiseman, 2004).
2UAN	"I like a grass lawn more than a place where flowers grow on their own." (Randler et al., 2024)
3UAN	"To feed people, nature must be cleared to grow food." (Randler et al., 2024)
4UAN	Weeds should be killed because they take up space from plants we need. (Randler et al., 2024)
Dominance	
1UD	"Building new roads is so important that trees should be cut down." (Randler et al., 2024)
2UD	"Because mosquitoes live in swamps, we should drain the swamps and use the land for farming." (Randler et al., 2024)
3UD	"People are supposed to rule over the rest of nature." (Randler et al., 2024)

Table 2. KMO and Bartlett's Test.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.751
Bartlett's Test of Sphericity	Approx. Chi-Square	3819.657
	df	120
	Sig.	.000

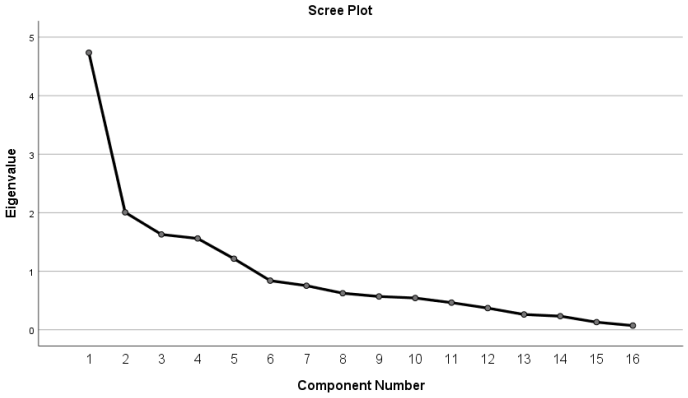

Figure 1. Scree Plot.

and their respective items. Due to the lack of a feature in SPSS to compute Average Variance Extracted (AVE) and Composite Reliability (CR) directly from the factor loadings, we performed the calculations manually utilizing the methods developed by Raykov (1997) (Kundu et al., 2024). The results indicate that the AVE values for the five constructs— "Intent of Support," "Care with Resources,"

"Enjoyment of Nature," "Altering Nature," and "Dominance"—are as follows: 0.58, 0.65, 0.57, 0.67, and 0.66, respectively. According to Fornell and Larcker (1981), an AVE of at least 0.50 is recommended. Since all the constructs exceeded this threshold, we conclude that they effectively measure the latent variables, thereby meeting the criteria for convergent validity. This provides further evidence for the authenticity and validity of the five factors.

Table 3. Factor Loading, AVE, CR, and Cronbach's alpha (α).

Factors	Items No.	Items Code	Factors Loadings (λ)	AVE#	CR##	Cronbach's alpha (α)
Intent of support	1	1PIS	.62	0.58	0.67	0.75
	2	2PIS	.75			
	3	3PIS	.79			
Care with Resources	4	1PCR	.77	0.65	0.71	0.79
	5	2PCR	.62			
	6	3PCR	.59			
Enjoyment of nature	7	1PEN	.72	0.57	0.67	0.81
	8	2PEN	.71			
	9	3PEN	.60			
Altering nature	10	1UAN	.87	0.67	0.61	0.76
	11	2UAN	.80			
	12	3UAN	.74			
	13	4UAN	.68			
Dominance	14	1UD	.83	0.63	0.64	0.72
	15	2UD	.79			
	16	3UD	.70			

Note(s): AVE# = $\sum(\lambda^2)/n$, where n = number of indicators or items under a contract CR## = $(\sum(\lambda^2)/[(\sum\lambda^2)+\sum(1-\lambda^2)]$ (formula invented by Raykov, 1997)

The CR values "Intent of support (0.67), Care with Resources (0.71), Enjoyment of nature (0.67), Altering nature (0.61), and Dominance (0.64)" are presented in Table 2 in a comparison way, along with the internal consistency. For the same factors, the corresponding Cronbach's alpha values are 0.75, 0.79, 0.81, 0.76, and 0.72, which is within acceptable norms. The necessary levels of reliability are present in all five constructions. Both are high and exceed the cutoff value of 0.07 in both instances. It concludes that each component is workable and dependable. Whether the results are computed manually or with SPSS, there is a noticeable low difference between them, which is also a positive indicator of strong reliability as per the rule of thumb (Kundu et al., 2024).

Determining the number of dimensions to retain for further analysis relies on the total variance explained. According to Kaiser and Caffrey (1965), the combined explanation of the data's total variance from the five components is 69.648%, as shown in Table 3. Specifically, the first component contributes 18.454% to the variation, the second component contributes 32.787%, the third contributes 46.280%, while the remaining components contribute gradually less. A more evenly distributed variance across the components, ranging from 18.456% to 10.560%, was achieved through the rotating sums of squared loadings. An Exploratory Factor Analysis (EFA) with a sample size of 110 was utilized, resulting in a Rotated Component Matrix for the subsequent analytical step. The underlying factor structure was rotated using Varimax with Kaiser normalization, and Principal Component Analysis (PCA) was employed as the extraction method (Ahmad et al., 2023). The rotation method implemented is orthogonal, based on the assumption that the elements are uncorrelated. This approach maximizes the variance of the squared loadings for each factor.

Table 4. Total variance explained.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.734	29.590	29.590	4.734	29.590	29.590	2.953	18.454	18.454
2	2.007	12.542	42.131	2.007	12.542	42.131	2.293	14.334	32.787
3	1.628	10.178	52.310	1.628	10.178	52.310	2.159	13.493	46.280
4	1.560	9.748	62.058	1.560	9.748	62.058	2.049	12.808	59.088
5	1.214	7.590	69.648	1.214	7.590	69.648	1.690	10.560	69.648
6	.839	5.245	74.893						
7	.753	4.705	79.598						
8	.624	3.902	83.500						
9	.569	3.557	87.057						
10	.542	3.389	90.446						
11	.463	2.895	93.342						
12	.370	2.313	95.655						
13	.261	1.634	97.289						
14	.232	1.451	98.740						
15	.130	.813	99.553						
16	.072	.447	100.000						

Extraction Method: Principal Component Analysis.

Table 5. Rotated Component Matrix.

Elements	Component 1	2	3	4	5
1PIS	.853				
2PIS	.836				
3PIS	.700				
1PCR		.928			
2PCR		.902			
3PCR		.922			
1PEN			.671		
2PEN			.745		
3PEN			.682		
1UAN				.699	
2UAN				.835	
3UAN				.787	
4UAN				.728	
1UD					.776
2UD					.731
3UD					.753

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Verifying factor structure with Confirmatory Factor Analysis (CFA)

Following EFA with the second half of the sample, or 112 respondents (Tinsley & Tinsley, 1987), CFA was used to validate the constructs and their quantifiable indicators. By visualizing and fitting the model, CFA is used to validate the outcomes of the EFA. The final structural model between the five latent variables was assessed using empirical data following the completion of CFA (Dash & Paul, 2021).

Table 5 presents the analytical summary of the model generated using IBM SPSS Amos v21. The standardized factor loadings range from 0.60 to 0.77, as illustrated in Figure 2. The five-component structure identified by exploratory factor analysis (EFA) is confirmed by confirmatory factor analysis (CFA). Three elements correspond to four factors: "intent of support," "care with resources," "enjoyment of nature," and "dominance." Additionally, four elements correspond to one factor labeled "altering nature." The alignment between EFA and CFA results enhances the construct validity of the measurement (Choudhury et al., 2024).

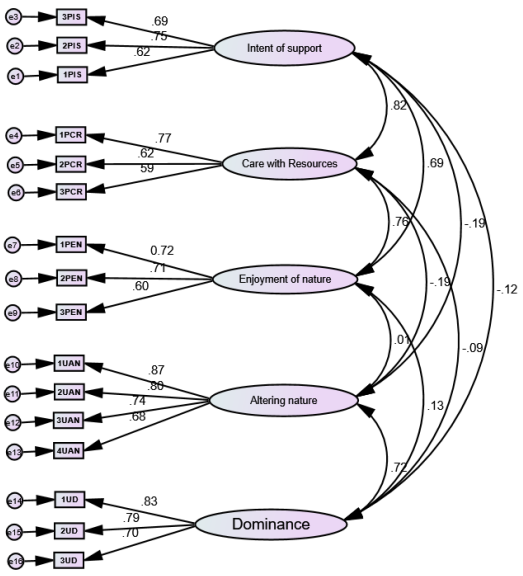

Figure 2. Factor structure of the model.

According to the indicators established by Hu and Bentler (1999), the CMIN/DF value is 1.654 (with a threshold limit of <3), and the chi-square p-value is 0.000 (<.05). The model also generated several goodness-of-fit indices: GFI = 0.923, AGFI = 0.803, CFI = 0.823, and NFI = 0.808, all of which exceed their respective threshold limits, indicating a good fit. The lower RMSEA value demonstrates how well the data fits the model, further supporting the appropriateness of the CFA measurement approach. Two indicators suggesting badness of fit are RMSEA = 0.026 (< 0.10) and SRMR = 0.042 (< 0.09), which further confirm that the model is appropriate.

Table 6. Summary of CFA Model fit.

Name of Category	*Model Fit indices*	*Threshold Limits*	*Value Attained*
Absolute fit Indices	X^2	p-value > 0.05	0.000
	RMSEA	>0.10 bad fit; 0.05-0.10 mediocre fit; and if <0.05 good fit	0.026
	SRMR	<0.09	0.042
	GFI	<0.90	0.823
Incremental Fit Indices	AGFI	>0.80	0.803
	PCFI	<0.80	.714
	CFI	>0.80 sometimes permissible; >0.90 traditional; and if >0.95 great	0.911
	TLI	>0.90	0.886
	NFI	>0.90	0.808
Parsimonious Fit	CMIN/ DF	<3 good; and if <5 sometimes permissible	1.654

Conclusion

Adolescent environmental attitudes in different European cultures have been examined using the 2-MEV scale since 1994, and it remains a valid assessment tool with a well-established theoretical foundation (Johnson & Manoli, 2010). Therefore, the current study aims to validate a scale for students' attitudes toward green education from various socioeconomic backgrounds in the context of West Bengal, India (Gorai et al., 2024). The author employed the same five components and the entire 16-item 2-MEV Scale from Johnson and Manoli (2010) to measure the GE attitudes of children ages 16–18. The scale has yielded robust findings that significantly contribute to our comprehension of the attitude towards green education through rigorous statistical analysis, such as EFA (refer Table 3), CFA (refer Table 6), and reliability testing. The 110 first subsample was used for EFA then the second subsample (112) was used for CFA, which falls within the acceptable limit of sample size (Tinsley & Tinsley, 1987). Table 3 indicated a commendable Cronbach's alpha for the internal consistency of the scale. CMIN/DF value of 1.654 and chi-square p-value of 0.000. Additional goodness indices that the model generated were GFI = 0.923, AGFI = 0.803, and CFI = 0.823, all of which indicate that the model is well-fitted and is over their corresponding threshold limits. In summary, the scale was subjected to strong evidence based on a systematic and comprehensive procedure. The 16-item 2-MEV revised scale is a valid and trustworthy instrument for evaluating higher secondary school students' attitudes concerning GE. The scale is appropriate for use in future research, even in various national and state contexts, as it has undergone many analyses to verify its validity and reliability. In addition to being a helpful tool for identifying gaps, this scale can aid researchers who want to better understand attitudes about GE in their future research. It may also help to increase awareness of environmental issues and enhance the quality of GE training after use.

Limitations

This research employed 222 respondents through purposive sampling, therefore investigating the attitudes toward green education on these measures may benefit from investigating a representative sample of Indian youth, ages 16 to 18.

Implications

This scale can be utilized because of its briefness and since it is intended to establish validity and reliability, but only in situations when environmental attitudes are not the primary focus of the research investigation, and the use of longer scales may be hampered by time restraints, compliance issues, or language barriers. Therefore, a modest study might focus on the five sub-factors under the above-mentioned preservation and utilization. The scale may be used by researchers, academics, and policymakers to understand the attitude of 16-18 aged children towards green education.

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Conflict of Interest

The authors declare that there is no conflict of interest.

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About the Author

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