

Defining Youth Environmental Value Towards First Class Mindset Component: A Scale Development



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ABSTRACT

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One of the elements to creating a first-class mindset among youth is environmental value. The present study was conducted to validate the component to build the model of environmental values amongst Malaysian youths with first-class minds. One thousand Malaysian youths were selected from five geographical zones (North, Central, South, East Coast, and East Malaysia). The sample was chosen using a stratified random sampling technique that considered gender, age, and location. A questionnaire was used as the research instrument. The environmental value constructs generated via exploratory factor analysis (EFA) were anthropocentric, ecocentric, and egocentric. The data were analysed to determine reliability using Cronbach's alpha. Confirmatory factor analysis (CFA) was used to obtain a three-factor solution with SPSS Version 22 and AMOS Version 20. The analysis showed that Cronbach's alpha was greater than 0.7, indicating high reliability. According to the recommended fit indices, the CFA analysis for the measurement model revealed that the three-factor solution was acceptable (CMIN=58.739, DF=32, CMIN/DF=3.967, GFI=.905, CFI=.966, TLI=.965, and RMSEA=.092). Therefore, the 28-item measurement model developed was appropriate for assessing the level of environmental value amongst youths with first-class minds. It could be used as a backup when developing environmental value instruments.

1. INTRODUCTION

The world's rapid modernisation has caused environmental, economic, social, and cultural disruption. However, some people believe it to be a necessary evil [1]. As a result, many people minimise the negative repercussions, most notably sustainability. Hence, education is the most effective way to increase global awareness of the conservation of the environment.

The United Nations designed the years 2005 to 2014 the decade of education for sustainable development (DEfSD). The aim was to integrate sustainable development principles, values, and practices into all facets of education and learning. This was reaffirmed in the Bonn Declaration 2009, which stated that education for sustainable development (ESD) represented a new direction for education and learning for all. The primary objective was to ensure that all people received a high-quality education founded on the values, principles, and practices necessary to address current and future challenges, particularly in the Industrial Revolution 4.0 era. The role of education in promoting sustainable development was evident in the Rio Conference's Agenda 21, which stated that education must be recognised as a process by which individuals and communities reach their full potential.

Sustainability education is crucial for producing world-class thinkers. According to Canterucci [2], such people have four

primary characteristics: Awareness, curiosity, focus, and initiative. Goleman's [3] theory of emotional intelligence identified awareness as a critical attribute for those skilled at managing their emotions. Conscious humans are constantly aware of what needs to be done for themselves, others, and the environment. Awareness ensures that individuals who possess it can adapt to any situation.

Inquisitiveness is indicative of those with a first-class mind. Curious individuals are not satisfied with merely determining the cause of an event. When a person is inquisitive, they seek additional knowledge to address questions. For instance, they constantly ask, "what if?" Curiosity is also at the heart of caring behaviour. It is critical if the mind and emotions are to make the best choices. Curiosity helps us to care about others and anticipate their wants and needs, and such behaviour becomes more appealing and acceptable [2].

The ability to focus on an issue, matter, or situation is also critical in determining how the mind perceives the best way to resolve a problem. It enables the individual to comprehend a situation or problem and employ a variety of approaches and methods for their personal and society's betterment. Focus necessitates a substantial investment in time and mental energy. In other words, the more concentrated attention that is given to a subject, the more information can be gathered for problem-solving purposes. Furthermore, it increases diligence and the capacity to develop a dynamic and rational mind [4].

Finally, these three characteristics spark the initiative to implement the best decision. This process stimulates the mind, which is then able to produce an exceptionally high-quality result.

The above primary characteristics contribute significantly to the development of the nine elements of the mind: integrity, humility, justice, fortitude, openness, faith in reason, courage, empathy, and autonomy (Figure 1) [5].

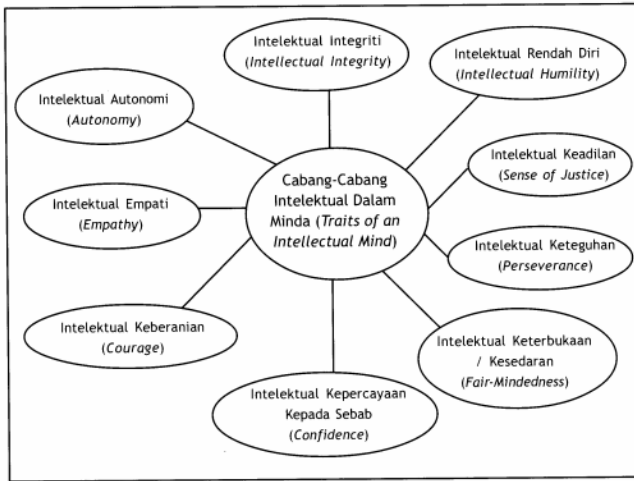


Figure 1. The intellectual branches of the mind [5]

As a result, this study was carried out to validate the component to build the model of environmental values among Malaysian youths with first-class minds from five geographical zones in Malaysia.

2. ENVIRONMENTAL VALUES AND FIRST-CLASS MINDS

In human life, values serve as indicators that guide behaviour. Individuals' values determine how they enter a situation and behave within it [6, 7]. Individuals adopt values as criteria when making decisions [8]. Danan Djaja [9] suggested that values direct an individual's attitudes, beliefs, and behaviour. To put it another way, values are a determining factor in human social behaviour [7, 9].

Additionally, values are one of the components contributing to the generation of behaviour. Numerous studies have demonstrated that behaviour can be altered by altering the structure of value systems [10] and that changes in values result in changes in attitudes and behaviour in daily life [11]. Values are intricately related to a person's experience and impact their motivations, reasoning, and justifications for their behaviour.

The environment is regarded as a complex system with intrinsic values, for example, that it, too, has rights and interests [12]. The environmental value system is not self-contained and exclusive; it is influenced by economic, political, and social value systems [13]. Different interpretations of environmental values lead to divergent interpretations of behaviour. The environment is a dynamic entity that constantly changes, whether spatially or temporally, naturally, or unnaturally.

The development of such a value system must take cultural diversity and environmental rights and interests into account when right and wrong behaviour are being proposed, identified,

and formulated. Developing an environmental value system compatible with each component's diverse beliefs, interests, and commitments is exceedingly difficult. It is a rallying point for missions and visions, rights, and obligations, as well as traditions and interests [14]. Despite its difficulties, this environmental value system is necessary because it contains the principles of proper procedure in human-environment interactions and serves as a foundation for resolving any conflict of interest between humans and the environment [15].

Researchers studying environmental value systems have attempted to demonstrate environmental values in everyone. Environmental value orientations are broadly classified into *anthropocentric* and *ecocentric* [16]. Some researchers consider anthropocentric to be synonymous with social altruism and ecocentric with *biocentric*. From an ethical standpoint, anthropocentric is seen to prioritise human beings; that is, only human beings have intrinsic value. By comparison, the intrinsic value of environmental components other than human beings is determined by their function and significance to human beings.

The ecocentric concept asserts that each environmental component has intrinsic value unrelated to human assessment. Stern and Dietz [17] proposed an additional premise for environmental value orientation, namely *egocentric*, in addition to anthropocentric and ecocentric values. Based on the egocentric viewpoint, nature is wholly owned by humans and must be preserved solely for human well-being. Egocentric is characterised as value-oriented individual interests, whereas anthropocentric is characterised as a value-oriented society. According to the researcher, ecocentric values all living organisms, not just humans.

However, some researchers dispute the distinction between anthropocentric and egocentric value orientations [18]. According to them, there is no distinguishing feature between the two orientations because they prioritise human interests. They propose a combination of anthropocentric and egoistic orientations, while the ecocentric maintains its orientation based on this rationale. Thus, the present study quantified the value of environmental sustainability using three constructs, or values: anthropocentric, ecocentric, and egocentric.

3. METHODOLOGY

3.1 Study model

Data were gathered via a questionnaire. The primary objective of the study was to develop a scale for assessing the level of environmental values amongst youth with first-class minds.

3.1 Population and study sample

The total sample comprised 1,000 young Malaysians aged between 20 and 39. They were selected using stratified random sampling based on their location, gender, and age. The age was determined following the National Youth Development Policy [19] and the Malaysian Youth Index [20]. The sample was then divided into two age groups—20 to 29 years and 30 to 39 years—to examine the differences between early-stage youths (20 to 29 years) and late-stage youths (31 to 39 years), as suggested by Erikson's [21] theory of developmental psychology. The youths aged between 20 and 39 years were chosen based on their ability to think and make decisions.

Table 1 shows that the total population of Malaysian youths aged 20 to 39 years is 11,146,000. Three criteria for inclusion were applied: (a) Krejcie and Morgan’s [22] sample table and Cohen, Manion, and Morrison’s [23] sample table; thus, if 10 study constructs were used for multiple regression analysis at a 0.05 significance level, the sample size had to be 833. In the present study, the estimated number of constructs was between 10 and 15 (the actual number would be determined by CFA analysis); and (b) according to Tabachnick and Fidell [24], the appropriate sample size for factor analysis was 300 respondents or 50 respondents for each factor. By contrast, Comrey and Lee [25] recommended a sample size of 1,000. In accordance with the guidelines for the three conditions, the study selected a total sample size of 1,000 individuals, as was noted above (Table 2). Live samples were collected at each stage using a stratified sampling method based on the location, gender, and age category of youths in each zone, as listed in Table 2.

3.3 Study location

The study location encompassed all of Malaysia’s states, which were divided into five zones. The first zone was the

northern zone. This included the states of Perlis, Penang, and Perak. The second zone was the central zone, which comprised Selangor, Kuala Lumpur, and Putrajaya. The third zone, which was the southern zone, encompassed Negeri Sembilan, Melaka, and Johor. The fourth zone that was the east coast zone included the states of Pahang, Kelantan, and Terengganu, while the fifth zone was the East Malaysia zone, encompassing the states of Sarawak and Sabah. Each zone's category is based on the classification of zones used by Malaysian government agencies such as the Department of Survey and Mapping Malaysia (JUPEM) and the Ministry of Education Malaysia (MOE). This method can also represent the study sample's overall characteristics. Figure 2 summarises the study locations by zone.

Table 1. Malaysian youth population by age

Age	Total population	Phase	Total
20 until 24	2,272,000	Early	4,509,000
25 until 29	2,237,000		
30 until 34	3,288,000	End	6,637,000
35 until 39	3,349,000		
Total	11,146,000	Total	11,146,000

Table 2. Study sample fraction

Location	Category								Total
	Rural				Urban				
	20 – 29 years old		30 – 39 years old		20 – 29 years old		30 – 39 years old		
Age Category	M		F		M		F		
Gender	M	F	M	F	M	F	M	F	
North (Perlis, Pulau Pinang, Perak)	25	25	25	25	25	25	25	25	200
Central (Selangor, Kuala Lumpur dan Putrajaya)	25	25	25	25	25	25	25	25	200
South (Negeri Sembilan, Melaka, Johor)	25	25	25	25	25	25	25	25	200
East Coast (Pahang, Kelantan, Terengganu)	25	25	25	25	25	25	25	25	200
East Malaysia (Sarawak, Sabah, Labuan)	25	25	25	25	25	25	25	25	200
Total	125	125	125	125	125	125	125	125	1000

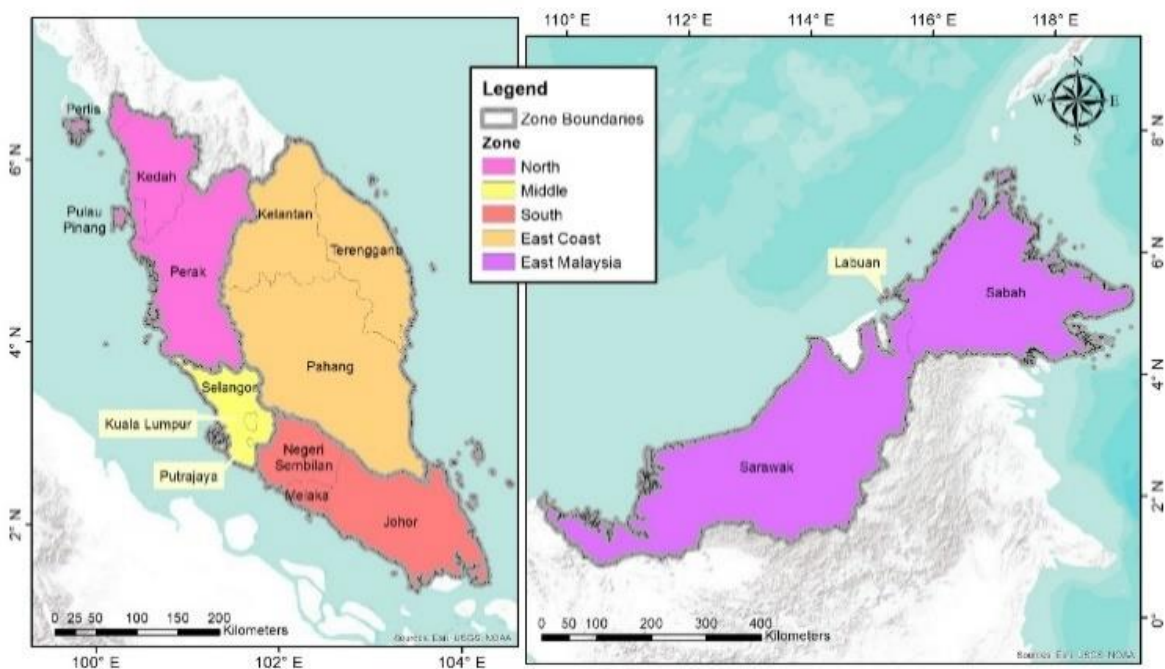


Figure 2. Locations of study area by zone



Figure 3. Phases of scale construction

Table 3. Items, statements, and sub-constructs of environmental values amongst youths with first-class minds

Sub-Construct	Item	Statement
Antroposentric Value (human to human)	n1	I like to convey environmental information to all family members.
	n2	I feel heartbroken if the government does not manage environmental pollution.
	n3	I feel anxious to see the behaviour of people polluting the environment.
	n4	I'm happy to see people save on electricity.
	n5	I'm happy if family members save water at home.
	n6	I do not mind people throwing rubbish everywhere.
	n7	I am concerned about environmental problems in residential areas.
Ecocentric Value (environmental)	n8	I feel proud if I don't use plastic bags to pack things.
	n9	I am satisfied if I can separate the garbage at home.
	n10	I'm in pain when it gets foggy.
	n11	I appreciate all living things.
	n12	I am happy to recycle aluminium, glass, cardboard, plastic, and paper products.
	n13	I like to use handkerchiefs instead of tissue paper.
	n14	I was happy to learn how to make compost.
	n15	I worry when using polystyrene as a food container.
	n16	I am satisfied when using a product packaged in recyclable containers.
	n17	I was happy when a tree I planted started to grow.
	n18	I enjoy biking or walking for close trips.
Egocentric Value (human-made)	n19	I love having a clean environment.
	n20	I was concerned about the smoke released by motor vehicles.
	n21	I am frustrated with the increasing pollution of the environment.
	n22	I am disappointed with the growing pollution of nature.
	n23	I like to read information/info related to the environment.
	n24	I am aware of my responsibility to the environment.
	n25	I am interested in reading environmental issues in electronic media.
	n26	I'm concerned about the issue of toxic waste disposal into rivers.
	n27	I feel regret if there is a party damaging the environment.
	n28	I am sad if there is a problem of river pollution.

3.4 Procedure

The scale construction procedure for the present study was based on previous literature. Scaledevstat [26] and McMillan and Schumacher [27] identified six processes in scale construction: conceptual framework construction, item clustering, content expert validity, pilot study, validity testing, and reliability testing (Figure 3).

3.4.1 Conceptual framework construction phase

A conceptual framework briefly describes a study's purpose, format, and stages or phases. It can be based on an established theory or self-designed. A conceptual framework is not yet fully developed, so is more tentative than a theoretical one. The conceptual framework serves as a guide for selecting the study's constructs or sub-constructs during scale development. Table 3 show a list of previous research-derived items, statements, and sub-constructs from Salwati [28], Kempton, Boster and Hartley [16] and Onur, Sahin and Tekkaya [29].

3.4.2 Item clustering phase

Confirmation factor analysis was used to analyse 50 codes obtained through a literature review. Twenty-five items were generated from 50 codes, as some of these statements should not be evaluated and should be stated more commonly.

3.4.3 Content expert validation phase

Following the item clustering phase, five content validation experts with expertise in instrument construction, environmental education, environmental management, sustainable environmental development and consumption, and consumer behaviour evaluated the scale. The content's validity was determined by judging and expert validation content relevant to the field studied twice using an evaluation form.

3.4.4 Pilot study phase

A pilot study was conducted following consultation with experts. It used a 5-point Likert scale questionnaire (1 = strongly disagree, 2 = disagree, 3 = not sure 4 = agree, and 5 = strongly agree). The questionnaire was distributed online to 100 youths in Bandar Belia Muallim, Perak, Malaysia (Table 4). The purpose of the pilot study was to ascertain whether respondents comprehended and responded appropriately to the scale. Afterwards, several items were revised in terms of language, expression, and structure based on feedback from pilot study participants.

Table 4. Reliability of pilot study questionnaire by construct

Construct	Number of Item	Cronbach Alpha Value
Antroposentric Value	.788	7
Ecocentric Value	.903	11
Egocentric Value	.969	10

Table 5. Normality test by construct

Construct	Mean	SD	Skewness	Kurtosis	Kolmogorov Smirnov
Antroposentric Value	4.380	.511	.373	-.761	p=.000
Ecocentric Value	4.369	.464	.049	-1.492	p=.000
Egocentric Value	4.583	.489	-.995	.327	p=.000

3.4.5 Validity and reliability testing phase

Following the completion of the pilot study and the refinement of the questionnaire, the field study was conducted using face-to-face and online questionnaires. To ascertain the validity of the constructs, normality tests were performed on each independent and dependent construct after collecting the study data. Table 5 shows that the mean and standard deviation of all constructs were almost identical. They had a normal distribution and thus were suitable for analysis. Pallant [30] stated that the standard deviation for skewness and kurtosis was between +2 and -2. All constructs were normally distributed in the normality test because they fell within the specified range.

Cronbach’s alpha was used to determine the questionnaire’s reliability. This test can be applied to a single measure to ensure that the same results are obtained repeatedly and under varied conditions. The term reliability refers to whether measurements are error-free and whether they consistently produce accurate data. Sekaran [31] asserted that the closer an item’s Cronbach’s alpha value was to 1, the more reliable it was. The values obtained for each construct in the present study were greater than .7, indicating a high level of reliability.

4. RESULTS

Construct and item validity was tested to determine the development scale validity of the environmental values amongst the participants. To ascertain the validity of scale constructs, item validity and discrimination indices were calculated using exploratory factor analysis (EFA) and CFA.

4.1 Exploratory factor analysis of environmental values amongst youths with first-class minds

The EFA results revealed a correlation coefficient greater than 0.5 in the anti-image correlation analysis procedure, so factor analysis could be performed. Kaiser-Meyer-Olkin (KMO) sampling adequacy measures and Bartlett’s test of sphericity showed a KMO value of 0.889 and a significant Bartlett’s test of sphericity with a chi-squared value of 3120.324 at 378 degrees of freedom (Table 6).

Table 6. Kaiser-Meyer-Olkin and measure of sampling adequacy value

Kaiser-Meyer-Olkin	Measure of Sampling Adequacy	0.889
Bartlett’s Test of Sphericity	Approx. Chi-Square Sphericity	3120.324
	df	378
	Sig.	.000

Factor analysis was performed, with the number of factors to be extracted set to three (as specified in the questionnaire). Table 7 shows the component matrix with varimax rotation. The varimax rotation method was used because it minimises the number of complex constructs while improving the

expected results. The values of n1, n2, n3, n4, n5, n6, and n7 belonged to component 1 (anthropocentric); n8, n9, n10, n11, n12, n13, n14, n15, n16, n17, and n18 were accumulated in component 2 (ecocentric); and n19, n20, n21, n22, n23, n24, n25, n26, n27, and n28 were accumulated in component 3 (egocentric). Table 4 displays the coefficients or loading factors for each item that tended to each accumulated factor. This value reflected the relationship between the item and the resulting factors, and it was essential for understanding the nature of these factors.

Table 7. Component matrix with varimax rotation domain of environmental values amongst youths with first-class minds

Item	Component / Construct		
	Antroposentric	Ekosentric	Egocentric
n1	.570		
n2	.746		
n3	.737		
n4	.741		
n5	.785		
n6	.724		
n7	.556		
n8		.667	
n9		.773	
n10		.625	
n11		.715	
n12		.855	
n13		.611	
n14		.620	
n15		.587	
n16		.753	
n17		.620	
n18		.669	
n19			.835
n20			.796
n21			.862
n22			.825
n23			.815
n24			.879
n25			.826
n26			.836
n27			.828
n28			.796

4.2 Confirmatory factor analysis of environmental values amongst youths with first-class minds

Arbuckle [32] and Tabannick and Fidell [24] have been frequently referred to when the suitability of developed models is being assessed. The present study used chi-square goodness of fit (χ^2), root mean square error of approximation (RMSEA), goodness-of-fit index (GFI), Tucker-Lewis Index (TLI), and comparative fit index (CFI). The recommended fit indices values of CMIN = 58.739, DF = 32, CMIN/DF = 3.967, GFI = .905, CFI = .966, TLI = .965, and RMSEA = .092 were found to be within acceptable ranges based on the cut-off point results of the validation factor analysis model (Figure 4) for the environmental values scale of the participants. As Table 8 shows, the values of fit indices indicate the model’s accuracy.

In other words, the scale constructions presented by EFA were validated.

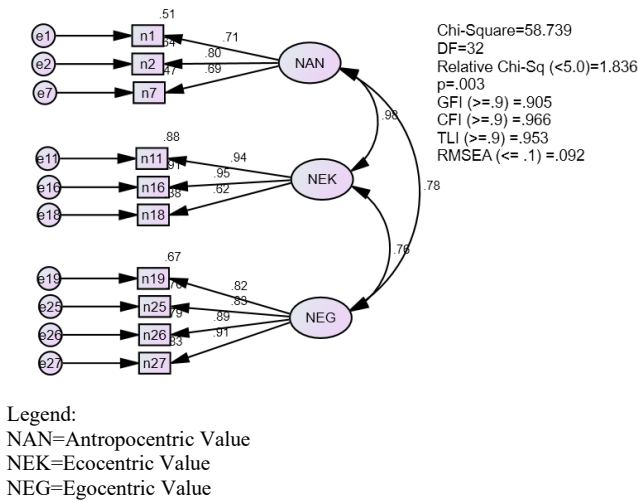


Figure 4. Validation factor analysis model for the environmental value scale of youths with first-class minds

Table 8. Fit indices for models and ranges

Fit Statistics	Perfect Fit Indices	Acceptable Fit	Fit Values of the Model
RMSEA	≤0.05	0.06 – 0.08	.092
GFI	≥0.95	0.94 – 0.90	.905
TLI	≥0.95	0.94 – 0.90	.953
FI	≥0.97	0.95 – 0.96	.966
χ/df	≤3	≤5	1.836

The resulting model was in line with the suggestions of Kempton, Boster, and Hartley [16] and Stern and Dietz [17]. The latter stated that environmental value orientation comprised anthropocentric, ecocentric, and egocentric values, while the former referred to the anthropocentric and ecocentric.

5. CONCLUSIONS

According to the EFA and CFA results, the present study achieved centralised and discriminant validity. The EFA findings revealed that the participants' environmental value scale comprised three values: anthropocentric, ecocentric, and egocentric. It was determined that the values of n1, n2, n3, n4, n5, n6, and n7 belonged to component 1 (anthropocentric); n8, n9, n10, n11, n12, n13, n14, n15, n16, n17, and n18 were accumulated in component 2 (ecocentric); and n19, n20, n21, n22, n23, n24, n25, n26, n27, and n28 were accumulated in component 3 (egocentric). The cut-off points fit indices of CMIN = 58.739, DF = 32, CMIN/DF = 3.967, GFI = .905, CFI = .966, TLI = .965, and RMSEA = .092 were within an acceptable range and met the prescribed requirements. The study's scale development model, which quantified the environmental values of Malaysian youths with first-class minds, could serve as a backup for constructing environmental value instruments. Indeed, it could assist the community in taking proactive steps to implement environmental sustainability participation activities, foster young people's environmental values, and encourage the development of a first-class-minded society in line with the goals of the Twelfth

Malaysia Plan, 2021-2025 and Sustainable Development Goals.

The limitation of this study is that it only includes a group of youth aged 21 to 40 years old and does not begin with youth aged 15 and up. This study also only follows five Malaysian zones and does not go into detail by state. Furthermore, only three sub-value variables, namely anthropocentric, ecocentric, and egocentric, were used in this study. This study's recommendation for future studies is to include a group of youths aged 15 to 19 years old, i.e. teenagers in secondary school. The study can also be subdivided by state and other sub-value variables.

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