

Research Article

The Influence of Characteristic Strengths on Nature Relatedness in Generation Z

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Abstract.

The many environmental problems, issues, and natural disasters make Generation Z feel compelled to carry out activities that reflect environmental concerns. One cannot be moved to carry out these noble activities voluntarily if one's characteristics do not refer to positive characteristics. Various factors, including individual characteristics, influence a person's tendency to engage in environmentally friendly activities. This research aims to see the relationship between characteristic strengths and nature relatedness, especially in Generation Z. This study used a quantitative method, with 301 generations Z subjects born in 1997–2012 in Indonesia who were selected using accidental sampling. Instruments in this study were the Nature Relatedness Scale (NRS) and the Values in Action Inventory Strength of Youth (VIA-Youth). The results of the research showed that there is a significant effect of characteristic strengths on nature-relatedness (significance value = $0.000 < 0.05$). From the three dimensions of characteristic strengths, only the transcendence strength does not affect nature-relatedness (significance value = $0.062 > 0.05$).

Keywords: characteristic strengths, generation Z, nature relatedness

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1. BACKGROUND

Environmental issues are becoming increasingly important in Indonesia. Deteriorating environmental conditions, such as air pollution and plastic waste, have sparked a movement to go green. Go green activity is an effort to improve environmental conditions by reducing the negative impacts caused by human activities. This activity is increasingly widespread and is widely carried out in all aspects, from reducing the use of paper and electricity to reducing waste. The go green movement is also increasingly popular among Indonesians, especially youth, who are increasingly aware of the importance of protecting the environment.

VOA reported that a group of five young friends named Pandawara went viral because of their cleaning up waterways, namely rivers or gutters that were clogged with garbage. Their videos on TikTok have gone viral, and many people have been inspired to make similar movements. Pandawara has cleaned over 80 polluted rivers in West

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Java because their homes were once flooded. By carrying out these activities, they are optimistic that they will reduce the waste in the rivers and prevent flooding. Their videos on TikTok inspire younger generations to take similar actions. According to data from Waste4change in 2023, Pandawara carried out river cleaning activities for one year and collected 27,066 kilograms of waste from 78 waterways in Bandung. There is a collaboration between the Pandawa Group and BRI Cares to clean up trash at the market and collaborate with hundreds of volunteers to clean up piles of trash on Lombok beaches.

Individuals will not be moved to carry out these noble activities voluntarily if a person's characteristics do not refer to positive characteristics. Research conducted by Luna and colleagues found that positive characteristics such as kindness, empathy, and social engagement were significantly associated with participating in noble activities, such as raising funds for charity or volunteering. It was also found that the positive characteristics possessed by a person can motivate them to carry out noble activities, even when faced with obstacles or risks [13]. As a mental process, characteristic strengths are favourable policies or traits that exist within an individual and are realized through feelings, thoughts, and actions [18].

The movement made by the Pandawara group in voluntarily cleaning the river can be linked to the characteristics and values possessed by Generation Z. Generation Z is the generation born between 1997 and 2012 [19]. Generation Z is a generation that grows and lives in the digital era and has a very different lifestyle from previous generations. They have different characteristics than the previous generation, especially regarding using technology and exploring the environment. One of the things that stands out about Generation Z is their interest in the environment and sustainability [12]. Generation Z has a higher environmental concern than the previous generation [10]. When an individual feels bound to nature, he can directly or indirectly be closer to nature and have a sense that nature is an essential element in his life.

According to a survey conducted by National Geographic in 2019, around 75% of Generation Z felt it was crucial to preserve nature. They also consider climate change to be one of the most serious problems the world is currently facing. In addition, a study conducted by Kantar Futures in 2022 also highlights the attachment of Generation Z to nature and the environment. According to the article, many members of Generation Z feel compelled to purchase environmentally friendly products and consider the environmental impact before purchasing.

In Indonesia, organizations such as Earth Hour Indonesia also involve Generation Z in their campaigns. They participate in activities to protect the environment. Meanwhile, Zero Waste Indonesia is a movement that invites people to reduce plastic use and choose environmentally friendly products [1]. Environmental organizations such as Greenpeace Indonesia also carry out campaigns to reduce river and sea pollution and promote renewable energy [3]. Furthermore, there are still many organizations, communities, and movements in which many young people care about the environment around them. Environmental education is essential in an increasingly complex era threatened by climate change and environmental damage. Generation Z is the generation that will face the impact of climate change and the environmental damage that is happening today. An individual's awareness of being bound by nature can also be called nature-relatedness. Today, attachment to nature is necessary to deal with natural problems that often occur. The importance of individual possession and nature-relatedness within someone makes them aware that all humans need nature for survival.

Natural problems have often occurred in recent years. Human activities can cause many natural disasters and natural damage in Indonesia. Based on data obtained from the National Disaster Management Agency (BNBP) in Indonesia alone in 2022, it was reported that 3,522 natural disasters and floods were frequent disasters throughout last year. As many as 1.7 million people in Indonesia were affected by floods and landslides. As a result of industrial and domestic waste, some rivers in Indonesia experience water pollution. According to data from the Ministry of Environment and Forestry, of the 280 significant rivers in Indonesia, only 20% have good water quality. According to the 2021 Indonesian Village Potential Statistics data compiled by the Central Bureau of Statistics (BPS), around 70.5% of villages or sub-districts in Indonesia still throw garbage into pits or burn it. Meanwhile, another 6.2% disposed of waste into rivers, irrigation canals, lakes, seas, or drainage. Only 19.4% of villages or sub-districts dispose of and transport waste in the trash. According to the climate report, NOAA's 2021 annual combined land and sea temperature has increased at an average rate of 0.08 degrees Celsius, which has been increasing more rapidly.

Changes, disasters, and damage to the earth require direct action by the world community so that they are more concerned about things around them, including having a sense of bond with nature. The attachment between nature and humans fosters some positive traits in humans. Protecting the environment from damage is one of the behaviours involved when an individual has an attachment to nature. According to past research in positive psychology, positive traits reflected in feelings, thoughts, and behaviour are characteristic strengths [18]. Prosperous psychological conditions can be

formed when the individual has positive character strengths [18]. Research proves that nature-relatedness has a positive influence on the psychological well-being of students [7]. Several studies have shown that character strength can contribute positively to individual well-being, while nature attachment can contribute positively to mental health.

In people's lives, especially the Z generation, the existence of technology has become very attached. In everyday life, technology has become something that causes dependence and addiction. Generation Z unconsciously forgets or even abandons their roles and responsibilities as social beings, students, and citizens because of today's technology's various conveniences, enjoyments, and practicalities [20]. Moral and mental degradation is a negative impact that is often found today. It is due to the eroded nature of individualism, hedonism, and pragmatism, to the worst of it, causing radicalism and intolerance [24].

A study conducted [6] found that students more connected to nature have higher levels of nature-relatedness. Higher individuals tend to have strength characteristics such as independence, adaptability, and creativity; they can also overcome fear and worry. Another study published in the journal *Ecopsychology* showed that attachment to nature also has a positive relationship with the strength of characteristics such as self-confidence, persistence, and social responsibility [14].

Here, the authors are interested in further research on the influence of characteristic strengths on nature-relatedness in Generation Z. In past research regarding the relationship between nature-relatedness and characteristic strengths, those with an educational background found that all characteristic strengths were significantly and positively related to nature-relatedness. Human awareness to protect nature is a positive behaviour obtained when individuals are aware of its existence and nature-relatedness within them [15]. However, there still needs to be more research exploring the influence of characteristic strengths on nature-relatedness in Generation Z. Therefore, this research can contribute to understanding how character strength can influence nature-relatedness in Generation Z.

This study examines the influence of characteristic strengths on nature relatedness, which is more specific in Generation Z, by focusing on the three dimensions of leadership strength, transcendence strength, and intellectual strength of the variable's characteristic strengths. For leadership strength, there is an indicator of leadership that can motivate someone with nature-relatedness. At the same time, intellectual strength has indicators of creativity, curiosity, and critical thinking. Transcendence strength has indicators that can be seen in the Pandawara group, who have an optimistic nature, where when the river they clean is dirty again, they will keep cleaning it.

Based on the explanation above, the purpose of conducting this research is to determine the effect of characteristic strengths on nature-relatedness in Generation Z. This research is expected to provide benefits as a reference source for developing knowledge in the world of education, especially those that focus on environmental psychology and can be used as a reference for further research. In addition, the problems or development of Generation Z can make this research a basis for determining behaviours or conditions that must be corrected.

2. RESEARCH METHODS

2.1. Variables or concepts studied

This study consists of two variables, the characteristic strengths dependent variable (X), while nature relatedness is the dependent variable (Y), where the independent variable affects the dependent variable. Characteristic strengths are a psychological component that can describe the main virtues in humans, both in the form of processes and mechanisms (Peterson & Seligman, 2004). In this study, three indicators of characteristic strengths are leadership strength, transcendence strength, and intellectual strength. As for the variable (Y), nature-relatedness is a term used to describe a person's level of connection with nature and the tendency to perceive and respond positively to the natural environment [11].

2.2. Sampling Method

Researchers use accidental sampling for sampling techniques. The technique of accidental sampling takes samples by chance, where if the person matches the characteristics as a source of research data, then anyone who happens to meet the researcher will be used as a sample [23]. In this study, there were 301 samples of Generation Z in Indonesia.

2.3. Research subject

In this study, there were 301 respondents, namely Generation Z. Generation Z is the generation born between 1997 -2012 [19] throughout Indonesia. In this study, the subjects were male and female, aged 13–23 years, and workers or students.

2.4. Research Instruments

In this research, characteristic strengths were measured using a scale adapted and developed by (John H Flavell, 1979) [9] called the Values in Action Inventory Strength of Youth (VIA-Youth). This study has three indicators of characteristic strengths: leadership strength, transcendence strength, and intellectual strength. There are 18 items, with six items for each indicator. Where it is known that the validity value is 0.217–0.628 and the reliability value on this measuring instrument is 0.811, it can be seen from the validity and reliability values of this measuring instrument that it is pretty valid and reliable. There are five categories of the subject's answer scale, namely: (1) very inappropriate; (2) not appropriate; (3) entirely appropriate; (4) appropriate; and (5) very suitable. With the example item, "I hope good things come into my life". In this research, nature-relatedness was measured using a scale from (Nisbet et al., 2011) [16] Nature Relatedness Scale (NRS), which has been adopted by Adiwena and Djuwita [2]. There are 24 items with a validity of 0.364–0.793, and the reliability value of this scale is 0.897. This scale is valid and reliable when viewed from the perspective of validity and reliability. There are five categories of the subject's answer scale, namely: (1) very inappropriate; (2) not appropriate; (3) quite appropriate; (4) appropriate; and (5) very suitable. Each indicator on this scale includes aspects of NR-self, NR-perspective, and NR-experience. With the example item, "I feel happy when I can look at the moon and stars at night".

2.5. Research design

The research method used in this study is quantitative, with data analysis methods using multiple linear regression, finding results from data obtained from a population or sample using research instruments. Then it is processed with statistical analysis techniques [23].

2.6. Data Collection Procedures

This study had three stages: data preparation, implementation, and analysis. The preparatory stage involves developing research instruments: scale characteristic strengths and nature relatedness. The researchers then analyzed the data using the Statistical Package for Social Science (SPSS) 26 to obtain valid and reliable items.

The second stage in implementing this research is to spread the scale. Before deploying the scale, the researcher first screens to ascertain the research needs and

looks for sample targets to be distributed as research instruments. The scale will be propagated using Google Forms.

The following process is entering data and then analyzing the data according to a predetermined method. The researcher used SPSS statistical software version 26 and multiple linear regression at this stage. After that, the researcher conducted data analysis and then compiled the discussion and conclusions, as well as the strengths and weaknesses of the research.

2.7. Data analysis technique

The research data analysis methods use multiple linear regression; multiple linear regression is a statistical analysis method used to test the effect of two or more independent variables on one dependent variable. The researcher used SPSS statistical software version 26 to analyze the data.

3. RESULT

TABLE 1: Data Description of Research Variables.

Variable	Categorization	Frequency	Percentage	Mean	SD
<i>Characteristic strengths</i>	low height	2 299	0.7% 99.3%	74.820	6.087
<i>Nature relatedness</i>	low height	10 291	3.3% 96.7%	97.524	8.719
<i>Intellectual strength</i>	low height	4 297	1.3% 98.7%	26.029	2.535
<i>Leadership strength</i>	low height	143 158	47.5% 52.5%	19.677	2.207
<i>Transcendence strength</i>	low height	8 293	2.7% 97.3%	24.677	2.821

There are two variables in this study, namely characteristic strengths and nature-relatedness. It can be seen in the categorization table above that the low categorization value is characteristic strengths by 0.7% in 2 subjects, and the high categorization value was 99.3% in 299 subjects. While on variables of nature relatedness, it is known that the low categorization value is 3.3% in 10 subjects, and the high categorization value is 96.7% in 291 subjects. There are three dimensions of characteristic strengths; within the dimension, intellectual strength has a low categorization value of 1.3% on four subjects and a high categorization value of 98.7% on 297 subjects. On dimensions of leadership strength, the low categorization value was 47.5% on 143 subjects, and the high categorization value was 52.5% on 158 subjects. For dimensions transcendence

strength, it is known that the low categorization value is 2.7% in 8 subjects, and the high categorization value is 97.3% in 293 subjects.

TABLE 2: Normality Test.

Variable	Skewness	Kurtosis
<i>Characteristic Strength</i>	-0.37	-1.77
<i>Nature Relatedness</i>	-1.45	-0.31

To find out whether the data is normally distributed or not, a normality test is performed. After eliminating outliers, there is data from 301 respondents tested for normality, as seen from the Skewness and Kurtosis data. If the data is more than 200, then for interpretation, you can use the Skewness and Kurtosis values. It is essential to see the shape of the distribution visually and see the statistical value of skewness and kurtosis rather than calculating the significance of Zskewness and Zkurtosis. Based on the results of the normality test using Kolmogorov-Smirnov and Shapiro-Wilk, the results show that the data is normally distributed, with a Z-Skewness value of -0.37 and Z-Kurtosis -1.77 for variable X and a Z-Skewness value of 1.45 and Z-Kurtosis -0.31 for variable Y. Where these values are still included in the ratio between 1.96 and 1.96, it is still said to be expected and is still within the range of normal conditions.

TABLE 3: Multiple Linear Test *Characteristic Strengths* to *Nature Relatedness*.

		ANOVA				
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6622.154	3	2207.385	40.501	.000 ^b
	Residual	16186.909	297	54.501		
	Total	22809.063	300			

Based on the table above, it is known that the calculated F value is greater than the F table value ($40,501 > 2.63$) with a significant value of <0.05 . It can be seen that the three dimensions of characteristic strengths simultaneously influence nature-relatedness.

TABLE 4: Multiple Linear Test Model Summary.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.539 ^a	.290	.283	7.38250

From Table 4, the magnitude of the correlation is 0.539, and the coefficient of determination (RSquare) is 0.290, which indicates that the effect of the independent variables (Characteristic Strengths) on the dependent variable (Nature Relatedness) is 29%. For variables, intellectual strength makes an effective contribution of 17%. The

variables of leadership strength gave an adequate contribution of 11.2%. At the same time, the variables' transcendence strength contributed an adequate contribution of 0.8%.

TABLE 5: Multiple & Multicollinearity Linear Regression Test.

		Coefficients						
		Unstandardized Coefficients		Standardized Coefficients				
	Model	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	42.199	5.194		8.125	.000		
	Internal	1.449	.190	.421	7.613	.000	.780	1.282
		.496	.224	.126	2.213	.028	.743	1.346
		.318	.170	.103	1.873	.062	.790	1.266

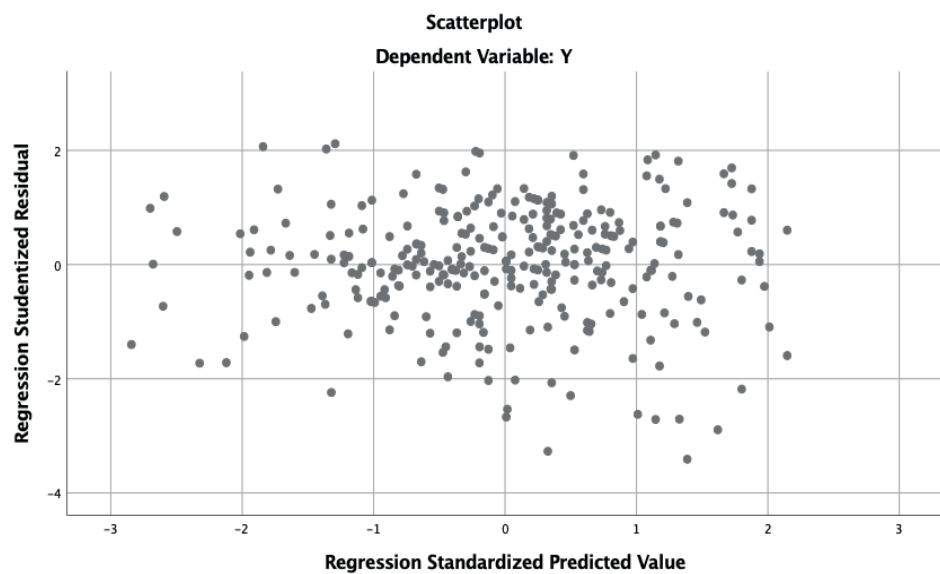


Figure 1: Scaterplot Heteroscedastisitas Test.

Researchers look at the tolerance and VIF columns to determine whether there are symptoms of multicollinearity. There are no symptoms of multicollinearity if the tolerance value is > 0.100 and the VIF value is < 10.00 . The table shows that the tolerance index ranges from 0.743 – 0.790, and the VIF index ranges from 1.266 – 1.346. Based on these results, all variables have a tolerance index of > 0.100 and a VIF < 10.00 , indicating that the data does not have symptoms of multicollinearity. Based on the table above, it is known that the significance value of characteristic strengths to the variable nature relatedness is $0.00 < 0.05$, so it can be seen that the variable characteristic strengths influence nature relatedness. While the significance value of intellectual strength is equal to $0.000 < 0.05$, which means intellectual strength influences nature-relatedness.

Next, the significance value for leadership strength is equal to $0.028 < 0.05$, which means leadership strength influences nature-relatedness. As for the significance value, transcendence strength is equal to $0.062 > 0.05$, which means transcendence strength does not affect nature-relatedness. Based on these results, it can be seen that the dimensions of characteristic strength predictably, together with nature-relatedness. Heteroscedasticity does not occur if there is no clear pattern (wavy, widened, then narrowed) in the scatterplot image and the dots spread above and below the number 0 on the Y axis. In the scatterplot graph, the resulting points are not clear and spread above and below the number 0 on the Y axis, so it can be concluded that there is no heteroscedasticity in the data of this study.

4. DISCUSSION

From the results of data analysis using multiple linear regression tests, it was found that there was a significant effect of characteristic strengths against nature-relatedness. However, we should review the influence of each dimension's characteristic strengths on nature-relatedness from an analysis of 301 Generation Z in Indonesia. In that case, two of the three dimensions have an influence. The dimensions are intellectual strength and leadership strength. Meanwhile, dimensions of transcendence strength do not affect nature-relatedness.

This study's results support previous research on the relationship between nature-relatedness and characteristic strengths of 967 students at a Spanish university [15]. This study takes an educational background to show that all dimensions are variables with characteristic strengths significantly and positively related to the variables' nature-relatedness. This study also explained that the dimensions of intellectual strength are very much related to nature-relatedness. This research also shows that cultivating attachment to nature through character strength is the primary goal of environmental education. This study provides insight into how nature-relatedness and characteristic strengths are intertwined and how the two can be leveraged to enhance environmental education and well-being.

The study results are related to this research, where the research results also show that intellectual strength has the highest value among the three dimensions studied. This finding yields that dimensions of intellectual strength on characteristic strength have a greater attachment to nature-relatedness. However, this study found a difference in that the subject was Generation Z, while the research only focused on studying students [15].

In this study, those who were measured were young people in Generation Z aged 8–23 years. These results indicate that Generation Z, which is relatively young, has a higher concern for environmental issues. This study's results align with previous research [12]. The research found that they have a solid link to the environment and sustainability issues. Previous research also reveals the effect of nature-relatedness on their consumption behaviour. Whereas in China, young people prefer to buy environmentally friendly products. What is interesting in the research is that the value of attachment to the environment positively influences their ability to reflect on problems in life. It means those with better attachments to nature will be much more capable of overcoming the problems. It also aligns with research conducted [5], in which youth play a role as agents of change in the framework of realizing sustainable development. This study used an empirical juridical method conducted in Kungkai Village, Jambi youth. The study results show that youth are essential to sustainable environmental development. Youth can play an important role in changing people's behaviour towards the environment and can also fight for environmental rights and promote environmentally friendly policies.

Previous research argues that connectedness with nature can benefit human well-being by improving mental and physical health, increasing happiness, and reducing stress. The research, conducted with 76 psychology students, examined nature affects positive affect and the ability to reflect on life's problems. This research also shows that connectedness with nature can be influenced by factors such as childhood experiences, adult experiences, and habits in interacting with nature. In line with research which shows that character strength is closely related to human well-being [8].

Young people with high nature relatedness have some usefulness or good trait that is characteristic strengths. A study conducted [6] found students with a level of nature-relatedness. Those with higher levels tend to have more robust characteristics like independence, adaptability, and creativity. In addition, they are also able to overcome fear and worry. The study by Colley and Craig also provides insight into how people's perceptions of nature can affect their attachment to the natural environment around them.

Research conducted by Luna and colleagues found that positive characteristics such as kindness, empathy, and social engagement were significantly associated with participating in noble activities, such as raising funds for charity or volunteering. It was also found that the positive characteristics possessed by a person can motivate them to carry out noble activities, even when faced with obstacles or risks [13]. As a mental process, characteristic strength is a favourable policy or trait that exists within an individual and is realized through feelings, thoughts, and actions [18].

The results of this study found that two dimensions of characteristic strengths affect nature-relatedness, and several other factors are discussed or related to intellectual strength, leadership strength, and transcendence strength. In this research, intellectual strength has a 17% contribution to nature-relatedness, while other variables contribute to the rest. According to previous research with a result of 26.7%, intellectual strength can affect career exploration variables. As for dimensions, leadership strength in Novella's research also contributed as much as 3.9%, whereas the value of leadership strength in research conducted on nature-relatedness was high, namely 11.2%. For the last dimension of transference strength in Novella's research, the contribution amount is 0.1%, while the value of transcendence strength of research conducted on nature relatedness is high, at 0.8% [17].

Previous research explained the relationship between social support and the characteristic strength of parents of children with cancer at the Bandung love house [21]. In this research on characteristic strength, there are five elements from the dimension of transcendence strength: religiosity, enthusiasm, gratitude, love, and hope. It was also found that the social support received by parents had a positive relationship with the fifth character possessed and needed by parents of children with cancer. In contrast to previous research, transcendence strength has no influence on nature-relatedness in this study. Other research with elements of transcendence strength that have different variables also exists in the research [4], where the five characters are on the dimension that transcendence strength has a significant positive relationship with the adequate adjustment of prisoners, with a value of $r_s = 0.830$.

Meanwhile, on dimensions of leadership strength, some studies also have different variables, which show that leadership strength in high school students in the city of Makassar has a significant correlation with self-regulated learning ($R=.70$, $p < .001$) [22]. In this regard, leadership strength can support high school students in Makassar in self-regulated learning, which can help them learn online during a pandemic. The research that has been done shows that nature-relatedness influences leadership strength, although only 0.96%, with the lowest results of the other three dimensions.

This research is inseparable from several limitations, namely the need for literature discussing nature relatedness to characteristic strengths conceptually, it still needs strengthening. However, this literature can later become a repertoire for further research on environmental psychology to develop this research further. In addition, there needed to be more in distributing questionnaires online in this study. Respondents could not confirm or ask questions directly if items needed to be clarified. Ignorance of online questionnaires is widespread, so the results obtained tend to be low-level and biased.

5. CONCLUSION

This research was found that there was a significant effect of characteristic strengths against nature-relatedness. It means that the higher the characteristic strengths someone has, the more nature-relatedness they have. However, suppose we review the influence of each dimension's characteristic strengths on nature-relatedness from an analysis of 301 Generation Z in Indonesia. In that case, two of the three dimensions have an influence. The dimensions are intellectual strength and leadership strength.

Meanwhile, dimensions of transcendence strength do not affect nature-relatedness. On the characteristic strength dimensions, intellectual strength has the highest influence on the three dimensions. When individuals have nature-relatedness, if the value is high, then the individual will tend to have favourable characteristics such as creativity, curiosity, the ability to learn new things, and the ability to realize and appreciate beauty. Implications of this research addressed Generation Z by year of birth

1997 -2012 to pay more attention to the environment and the surrounding nature and to be more interested in environmental issues so that they have an attachment to nature. When Generation Z has benefits or traits, a good one, namely characteristic strength, will also have an attachment to good nature. For further research, it is expected to add variables such as temperance strength, other-directed strength, and metacognitive strength. In addition, it can also use different subjects, such as in specific age ranges, namely early adolescence and early adulthood.

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Ethics Policy

Informed consent is used for participants consent to fill out the questionnaire.

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