

## **Ecological Behavior Intention: The Role of Ecological Sciences, Ecological Value and Pro-Environmental Identity.**

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**Abstract:** *This study developed a model of environmental attitude of Kaiser, et al (1999) with Self Identity Pro-Environment of Whitmarsh and O'Neill (2010). In particular, this study aims to examine the antecedents of Ecological Intention, namely environmental Knowledge, environmental Value, and Self-Identity Pro-Environment in the Indonesian context.*

*The survey was conducted on 136 students at the University Khairun, Ternate, Indonesia by using convenience sampling. Hypotheses were tested using Partial Least Square - Structural Equation Models with Smart PLS program Ver. 2 M3.*

*The study found that environmental knowledge has no significant effect on ecological intentions, while the environmental Value and Self- Identity Pro-Environment has significant effect on ecological intention. This study also found indications of the moderating effects of gender and the moderating effects of learning about the environment. Also found indication of the influence of environmental knowledge in the form of self-identity pro-environmental. Several limitations of this study have also revealed and directions for future research were discussed.*

**Keywords:** *Environmental Knowledge, Environmental Value, Self-Identity Pro-Environment, Ecological Intention, Indonesia.*

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### **I. Introduction.**

Environmental issues and accelerate the amendment has become a fundamental part of the problem world ( Kalantari , Fami , Asadi , and Mohammadi , 2007) ( 1 ) . Recent decades , the social dimensions of environmental issues such as public attention and public attitudes towards the environment has become one part of environmental sociology and environmental psychology . This indicates the growth of the world's attention on the preservation of the environment . Kalantari , et al ( 2007) ( 2 ) states that environmental problems occur because of human behavior and simply by changing human behavior for a friendly environment that can reduce these problems .

Studies conducted by Whit marsh and O'Neill ( 2010 ) ( 6 ) found that the self-identity of pro - environment ( Self - identity pro - environmental ) is a strong predictor of behavioral ecology . They suggested to conduct further research on pro - environmental behavior of others . Accordingly, Clark and Finley (2007 ) ( 7 ) states that the majority ( vast majority ) value - related research environment ( environmental values ) and attitude ( attitude ) conducted in the western world , and its application to non - western is still questionable

Taking into account the views of Clark and Finley (2007 ) ( 7 ) that the application of environmental values and attitudes ( environmental attitude) need to be studied in a non - western , this study seeks to fill the gap by developing a model of environmental attitude of the Kaiser , et al (1999 ) by incorporating predictors of self-identity pro - environment posed by Whit mars and O'Neill ( 2010) ( 8 ) and test it in the context of Indonesia.

### **II. Reference Theory.**

Behavioral literature indicates that attitudes towards the environment variables, situational and psychological factors are important predictors, although the investigation of the influence of these factors requires a theoretical framework such as that provided by the Theory of Planned Behavior (TPB) (Tonglet, et al, 2004). In this regard, various researchers have used the Theory of Reasoned Action (TRA) and its development (TPB) as the main theory in predicting ecological behavior ( Azjen, et al, 2011; Fielding, McDonald, Louis, 2008)..

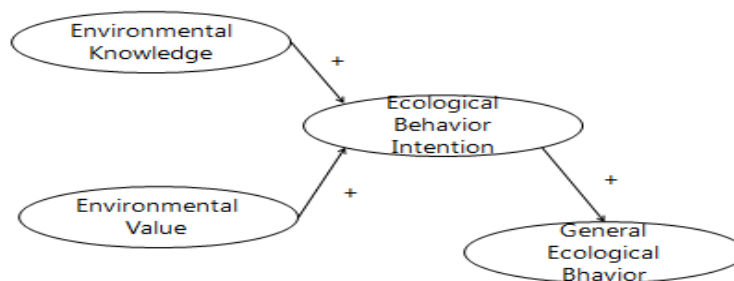
The theory explains that behavior is determined by intentions to behave. While the intention to behave is influenced by the attitude behavior, subjective norms, and perceived behavioral control (Kaiser, et al, 1999). Based on this theory, it was explained that ecological behavior is influenced by ecological behavioral intention. Ecological behavioral intention itself is affected by attitudes toward ecological behavior, social norms related to ecological behavior, and perceptions of behavioral control.

TRA criticized by Kaiser, et al (1999) because it does not include a moral dimension is very important in predicting ecological behavior. This criticism is based on ecological behavior that literature is not only selfish

but also focuses on the welfare of the people (people's welfare). This means that it is very important to use a framework that can be adapted to align the goals of the research attitude of ecological (environmental attitude).

Studies of Lyne and Rola (1988) in Kaiser, et al (1999) found a strong relationship between attitudes toward the environment (environmental attitude) and ecological behavior. Kaiser, et al (1999) that if assert attitudes toward the environment refers to the components, then the ecological knowledge, ecological values and ecological behavior intentions should be considered (Figure 1).

Figure 1: Model environmental attitude of the Kaiser, et al (1999).



Ecological and Behavioral Intention Ecological Knowledge.

Behavioral intention is simply defined as the desire to perform an action. Ajzen, et al (2011) defines a person's intention as conscious motivation or plan to use a business decision to implement a particular behavior. Ecological behavioral intention is simply defined as a desire not to do damage to the environment. In this case, it can also be defined as a desire to preserve the environment. As already discussed in the theory of behavior (TRA or TPB) earlier, that behavioral intention is influenced by attitude toward the behavior, subjective norms, and behaviors related to perception of behavioral control.

Attitudes related to behavior, Ajzen, et al (2011) argued that the general attitude (general attitude) usually have a prediction that is not too good for a specific behavior. In regard to ecological behavior, Kaiser, et al (1999) argue that attitudes toward ecological behavior (environmental attitude) refers to the individual's knowledge on the ecology. Ecological knowledge is knowledge about the environment. Furthermore, Ajzen, et al (2011) explains that knowledge is a prerequisite for effective behavior. Only by having the right knowledge then one can produce the desired outcomes. Yusof, Singh, and Razak (2013) argued that ecological knowledge is general knowledge of the facts, concepts, and relationships associated primarily natural environment and ecosystems. Simply put, knowledge is a public understanding of the ecological environment.

Kaiser, et al (1999) argue that ecological knowledge should play an important role in shaping attitudes toward the environment (environmental attitude). D 'Sauza, et al (2006) in a study of Kaiser, et al (1999) and Kaiser, Ranney, Hartig, and Bowler (1999) for example, found that ecological knowledge have a positive impact on the ecological behavior intention. When a person has knowledge of the environment, related to what and how the role of the environment in human life, then he will be consciously strive for the environment is not damaged. The first hypothesis is proposed.

Safe, Aaron, and Hussein (2012) explains that ecological knowledge structured in two forms: (1) (individual) educated to understand the impact (behavior) on the environment, and (2) knowledge (people) related to previous behaviors that are environmentally friendly. They argued that if the individual has knowledge of the environment, well educated as well as the results of previous experience, the individuals tend to favor ecological behavior (Aman, et al, 2012).

#### **Ecological and Behavioral Intention Ecological Value.**

Henning and Karlsson (2011) argued that past research concludes that there is a high correlation between the value of the individual (person's value) with a commitment to pro-environmental behavior, and therefore, there is a relationship between ecological values and ecological behavior. Yusof, et al (2013) explains that the values found as a factor underlying all decisions (consumer). Henning and Karlsson (2011) believes that the related environmental values will relate more strongly to the intention. Kaiser, et al (1999) also explains that ecological values are directly related to ecological behavior intention. That is, the stronger the ecological values held by the individual, then the stronger the intention to behave ecologically. This is corroborated by previous investigators, for example, Axelrod (1994) in Kaiser, et al (1999) and Kaiser, et al (1999) and Henning and Karlsson (2011). The second hypothesis is proposed.

#### **Ecological Behavior Intention and self - Ecological Identity.**

Identity has been discovered as a predictor of behavior goes beyond (over and above) TPB variables, including in relation to pro-environmental behavior (Whit marsh and O'Neill, 2010). Smith, Terry, Manstead, Louis, Kotterman, and Wolf (2007) explains that in the literature of sociology and psychology, self-identity has

been seen as an important determinant of behavior. According to them, self-identity is a prominent part of a person associated with certain behaviors and can be initiated as working on a degree that behavior is an important component of a person's self-concept (Smith, et al, 2007).

In this case, ecological identity is defined as an individual's identification as a pro-environmental. For example, an individual who sees himself as a recycler again, would like to recycle than those who did not perceive himself as a re-recycler (Whit marsh and O'Neill, 2010). In the same logic, an individual who perceives himself as pro-environment, it would be like to perform activities of pro-environment than those who do not.

Fielding, et al (2008) explains that individual behavior will be based on the group and directed by the norms that exist in the group. Categorization processes in relation to social identity as a result of the emphasis on the similarities between the individual members in the group, and the differences between individuals with out-group members. Sparks and Shep hard (1992) in Whit marsh and O 'Neill (2010) found that individuals who identify themselves as "green consumer" would prefer to buy organic foods than those who do not.

Whit marsh and O'Neill (2010) found that the stronger a person identifying himself as pro-environment, the stronger the individual's intention to behave ecologically. The third hypothesis is proposed.

### III. Methods.

The study design, this study was designed as a formal research, or so-called research confirm, as confirming the theory in different research environments, and includes a causal study, because this study aims to examine the antecedents of ecological behavior intention. Operational Definition and Measurement, In this study, there are four (4) variables, which consist of 1 (one) dependent variable, and three (3) independent variables.

Table1: Definitions, Item, and Referral

	Definition	Item	Referral
EcologicalBehaviorIntention	The desiretopreservethe environment	4 item	Ajzen, <i>et al</i> (2011)
KnowledgeEcology	Knowledge of theenvironment	4 item	Kaiser, <i>et al</i> (1999)
EcologicalValue	Values heldby individualsassociatedenvironmental	3 item	Kaiser, <i>et al</i> (1999)
Self-Identity	Identification of individualsasaproenvironment	4 item	Whit marsh and O'Neill (2010)

Ecological intention is the dependent variable, while the Ecological Sciences, Ecological Value and Self-Identity is the independent variable. Here are described on the definition, the number of items, as well as the reference. Entirely using a Likert scale with the argument that the Likert scale is a scale that is more reliable and provides more information than other scales (Cooper and Schindler, 2008:310).

**Sampling methods**, data collection was done by the communication approach (Cooper and Schindler, 2008; 143) via surveys to students, going directly and asked to answer the statements in the questionnaire. By using a convenience sampling method. Convenience sampling including non probability Sampling techniques, this technique gives researchers the freedom in choosing the appropriate respondent (Cooper and Schindler, 2008:397). Sample unit in this study is the individual, in this case is Khairun University students. Magnitude of the respondents followed the advice Hair, Black, Babin, and Anderson (2010:176), ie the number of sample size that provides power > 0.80. By using G \* Power post hoc method, the sample size gives a power of 136 0.97 > 0.80. Thus, the magnitude of the sample size in this study sufficient for further analysis ..

#### Testing Instrument.

Discriminant validity was tested based on the factor loading of each indicator has a high loading on constructs his and AVE values greater than the value of the correlation between constructs his (Hair, Ringle, and Sarstedt, 2011).

Reliability indicators tested by loading factor loading factor criterion is  $\geq 0.70$  and t-test significant at alpha 0.05 (Hair, et al, 2011). research indicates that the instrument has a loading factor of  $\geq 0.70$  and significant at the 5% alpha PE4 except as described. From the results of testing the validity and reliability of research instruments, concluded on the whole question items are valid and reliable. Thus the research instrument can be analyzed further.

**Methods of Data Analysis**, Data Analysis using Structural Equation Modeling (SEM) based components. SEM is a multivariate technique that provides simultaneous estimation of many equations (Hair, et al, 2010:634). The analytical method used is based SEM component (component-based) program Smart PLS Ver.2.M3 (Ringle, Wende, and Will, 2005). Partial Least Square (PLS) has several advantages, such as robustness, can handle all types of data, assuming a minimum of the characteristics of the data (Hair, et al, 2010:775). Hair, et al (2011) indicate if the purpose of the study is an extension of the structural theory (research extension) then the PLS-SEM is the most appropriate.

Smart PLS program Ver.2.M3 provide two stages in analyzing the data, namely (1) to test the measurement model using the PLS algorithm function include the value of testing the validity, reliability testing and path coefficient / path as well as the value of determination, and (2) testing the structural model to generate

significant value (the value of t statistics) the relationship between latent variables path, using bootstrapping function. The significance level used in this study is at 5% alpha.

**IV. Data Analysis**

Data Quality Research, Before perform advanced data analysis, the data need to be tested assumptions are required. Test assumptions require among other things, testing univariate normality assumptions, using the Kolmogorov-Smirnov and Shapiro-Wilk test to strengthen. To test this, use of SPSS version 19.

Tabel 2: Tests of Normality

	Kolmogorov -Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
PE3	,456	136	,000	,585	136	,000
PE4	,230	136	,000	,858	136	,000
NE1	,442	136	,000	,609	136	,000
NE2	,414	136	,000	,651	136	,000
ID1	,239	136	,000	,850	136	,000
ID2	,282	136	,000	,790	136	,000
ID4	,257	136	,000	,804	136	,000
Intensi1	,360	136	,000	,704	136	,000
Intensi3	,324	136	,000	,748	136	,000

a. Lilliefors Significance Correction  
source :primarydata, processed.

Of the Kolmogorov-Smirnov test and the Shapiro-Wilk test, all indicators showed  $p < 0.05$ . This suggests that the hypothesis that the data are normally distributed is rejected. Means that the data is not normal. Hair, et al (2011) states that if the data are normally distributed then the right choice of SEM analysis is covariance-based SEM (eg Amos or LISREL), otherwise if the data were not normally distributed the SEM-PLS is the right choice. Therefore, advanced data analysis using SEM-PLS with Smart PLS program Version 2 M3.

Descriptive Analysis, On the descriptive analysis will be presented average value (mean), the largest value (maximum), the smallest value (minimum), standard deviations, and correlations between variables.

Table 3: Mean, Maximum, Minimum, and Standard Deviation

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Variable	Mean	Maximum	Minimum	Std. Deviation
Ecological knowledge	3,58	4,36	1,76	0,64482
Ecological Value	3,3692	3,88	1,33	0,66517
Identity Pro Environment	3,5577	4,55	1,48	0,69238
Ecological intention	3,5566	4,29	1,78	0,70765

Source: primary data, processed.

In Table 3 above, it is seen that the mean values were in the range from 3.5 to 3.6 with a standard deviation range is in the range from 0.64 to 0.70. The maximum value is at 4.55 which is the Identity Pro-environment variable, and the minimum value is at 1.33 which is the variable Ecological Value.

Table 4: Correlation Between Variables

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	Identity Pro-Environment	Ecological intention	Ecological Value	Ecological knowledge
Identity Pro-Environment	1	0	0	0
Ecological intention	0,5237	1	0	0
Ecological Value	0,2128	0,3825	1	0
Ecological knowledge	0,2986	0,295	0,4448	1

Source :primary data, processed.

Table 4 shows the correlations between variables, Ecological Intention strongly correlated ( $r = 0.5237$ ) and significantly ( $p < 0.05$ ) with Pro-Environmental Identity. While the Ecological Value weakly correlated ( $r = 0.2128$ ) and significantly ( $p < 0.05$ ) with Pro-Environmental Identity. In general, all variables correlated ranging from weak to strong correlation ..

Table 5: Description by Sex

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	sex	Mean	SD	t-hitung	prob
Ecological knowledge	Man	3,5596	0,66357	-0,433	0,666
	Women	3,6083	0,62263		
Ecological Value	Man	3,2727	0,72218	-2,014	0,046

	Women	3,5029	0,55574		
Identity Pro-Environment	Man	3,4722	0,70628	-1,708	0,09
	Women	3,6763	0,66048		
Ecological intention	Man	3,4646	0,69083	-1,799	0,076
	Women	3,6841	0,71694		

Source :primary data, processed.

Table 4 shows that the Ecological Knowledge, Identity Pro-Environmental and Ecological Intention did not differ between males and females ( $p > 0.05$ ). While women Ecological Value ( $M = 3.502$ ) higher than men Ecological Value ( $M = 3.272$ ) ( $p < 0.05$ ). In general, the score of all the variables in both men and women are at a moderate level..

From Table 5 it can be seen that they are learning about the environment have Environmental Identity Pro-high ( $M = 3.6436$ ) than those not learn about the environment ( $M = 3.1127$ ) ( $p < 0.05$ ). However, there was no difference in the Ecological Sciences, Ecological Value and Ecological Intention among those who learn about the environment and those who did not ( $p > 0.05$ ).

Table6: Description Based on Learning Environment

	Learning About the Environment	Mean	SD	t-hitung	Prob
Ecological knowledge	No	3,4086	0,56447	-1,366	0,174
	Yes	3,6131	0,65629		
Ecological Value	No	3,277	0,80323	-0,709	0,48
	Yes	3,3869	0,63774		
Identity Pro-Environment	No	3,1127	0,61925	-3,421	0,001
	Yes	3,6436	0,67487		
Ecological intention	No	3,3391	0,69988	-1,583	0,116
	Yes	3,5985	0,70445		

Source :primary data, processed.

**Goodness of Fit Model (Go F Model)**

Go F assessment model can be seen in the amount of R2 (R Square). Table 13 shows the amount of R square at 0.3525. This means that the proposed model is able to explain 35.25% is explained by the intention Ecological Knowledge, Ecological Value, and Pro-Environmental Identity and the rest are variables outside the model. The amount of 0.3525 indicates the proposed model is good enough.

Table7: Goodness of Fit Model

	R Square	Communality
Identity Pro-Environment		0,6053
Ecological intention	0,3524	0,7398
Ecological Value		0,7414
Ecological knowledge		0,6175
	0,3524	0,676
Goodness-of-Fit		0,488

Source :primary data, processed.

Schepers, Wetzel, and de Ruyter (2005) explains that PLS does not have a single measurement Go F. R2 value indicates whether the model meets its goal of maximizing the variance. Cohen (1988) in Schepers, et al, (2005) explains that the effect size of R2 can be grouped under the category of small ( $R2 = 0.02$ ), moderate ( $R2 = 0.13$ ), and large ( $R2 = 0.26$ ) .

This model shows the R2 for Ecological Intention (Table 13) are in the large category ( $R2 = 0.3524 > 0.26$ ). The model in this study showed a large effect size. T. Vinzi, Chatelin, and Lauro (2005) develop a global measurements fit with the formula

$$Go F = \sqrt{\bar{C} \times \bar{R}^2} \dots\dots\dots (1)$$

Go F = Goodness-of-Fit

$\bar{C}$  = Communality average value

$\bar{R}^2$  = R-Square average value.

From Table 7 it can be seen that the Go F model was 0.488. Thus, the model proposed in this study are in either category.

**Hypothesis testing**, structural testing results can be explained as follows:

1. Path coefficients between Ecological Knowledge and Ecological Intention was not significant (0.04,  $p > 0.05$ ). This means that statistically, Ecological Knowledge and no significant positive effect on Ecological Intention. The first hypothesis is not supported.
2. Path coefficients between Ecological Value and Ecological Intention significant (0.268,  $p < 0.05$ ). This means that statistically, Ecological Value and significant positive effect on Ecological Intention. The second hypothesis is supported.
3. Path coefficients between Identity Pro-Environmental and Ecological Intention significant (0.4547,  $p < 0.05$ ). This means that statistically, Pro-Environment Identity positive and significant effect on Ecological Intention. The third hypothesis is supported.

Table 8: Hypothesis Test Results.

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Hypothesis	Original Sample (O)	T Statistics ((O/STERR))	Prob.	Information
H1: Ecological Knowledge has a positive effect on the intention Ecological	0,04	0,4641	0,321	Not Supported
H2: Ecological value has a positive effect on the intention Ecological	0,268	3,097	0,001	be supported
H3: The identity of Environmental Pro has a positive effect on the intention Ecological	0,4547	5,8662	0,000	be supported

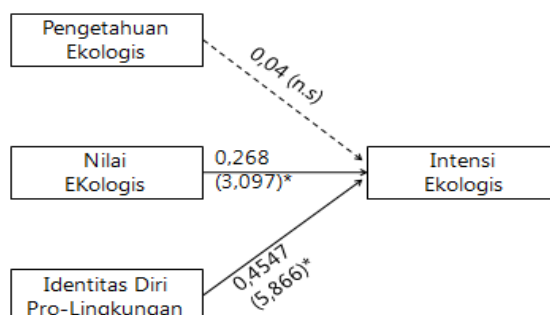
Source :primary data, processed.

## V. Discussion

The first hypothesis proposed is not supported ( $p > 0.05$ ). Apparently, the results of the analysis are not consistent with the proposed hypothesis. This finding contrasts with the findings of the Kaiser, et al (1999) who found a positive effect between ecological knowledge with ecological intentions. However, this study was supported by Henning and Karlsson (2011) who found no significant effect of ecological knowledge on ecological intentions.

This hypothesis is not supported it can be explained that learning about the environment did not make Ecological Knowledge to drive one wishes to preserve the environment, however, learn about the environment further strengthen Identity Pro-environment, such as those found in the previous descriptive analysis. Ecological knowledge that all life contingent to each other, as well as knowledge about the dangers of rising levels of CO<sub>2</sub> to the environment does not trigger the desire of individuals to behave environmentally friendly. However, this knowledge is indicated strengthen a person's identity to be pro-environment.

Figure 2: Final Model



Note :ns=not significant; Figure in parentheses() area-values;\*significant at alpha0.01

The second hypothesis proposed in this study supported ( $p < 0.05$ ). This is in line with the findings of the Kaiser, et al (1999) who found that strong Ecological Value will encourage Ecological Intention. Ecological values such as the belief that all living beings, whether human, plants, and animals have the right to live a good life and that humans, plants, and animals are very valuable, it is strong enough to push the intention to behave does not damage the environment. Can be explained that the stronger the ecological values are believed to be a person, then the stronger the desire to preserve the environment. Ecological values is able to support significant ecological behavioral intention.

The third hypothesis proposed in this study was supported ( $p < 0.05$ ). This is consistent with findings from studies conducted by Smith, et al (2007) and Whit marsh and O'Neill (2010). They found that the more a person identifying himself as an individual who pro-environment, then the stronger the desire to behave ecologically. Simply put, when a person believes that he is a person who is very concerned with environmental

issues, and then trying to live a lifestyle that does not damage the environment, then the stronger the intention to not damage the environment, and then push it to preserve the environment.

This is also in line with the argument of the Rise, Sheeran, and Hukkelberg (2010) which asserts that individuals (people's) behavior by adjusting the standard identity. If a person sees himself as an eco-friendly individual, then he will keep his behavior in accordance with its self-concept. The study also found that the Identity Pro-Environmental Ecological strong predictor of intention (coefficient = 0.4547) than Ecological Knowledge and Ecological Values. This finding is also consistent with studies Whit marsh and O'Neill (2010).

Thus, in general, can be explained that the intention Ecological positively and significantly influenced by the Ecological Value and Identity Pro-Environment. The stronger the ecological values held by someone then the stronger the desire to not damage the environment. Similarly, the stronger the Identity Pro-environment a person has, the more powerful the ecological intentions. Ecologically driven by strong intentions of pro-environmental self-identity, ecological values and ecological knowledge. On the other hand, although not significantly influence Ecological Knowledge, however, indicated able to strengthen Identity Pro-Environment.

## VI. Conclusion.

From the analysis of the data on the four (4) above, we can conclude several things, among others: the model proposed in this study has a goodness-of-fit is good ( $R^2 = 0.35$ ). That the ecological value of women is higher than men, while ecological knowledge, identity pro-environmental, and ecological intentions did not differ between men and women. They are learning about the environment have a pro-environmental self-identity that is higher than that did not learn about the environment.

It can be concluded that the two (2) of the three (3) supported the proposed hypothesis. Ecological knowledge (research question 1) found no significant effect on ecological intentions. Ecological value (research question 2) and pro-environmental self-identity (research question 3) positive and significant impact on the ecological intentions.

The study also concludes that there is an indication that the influence of ecological knowledge, ecological values and pro-environmental self-identity in ecological intention is moderated by gender, as well as on whether they've previously learned about the environment. Other findings are indications of ecological knowledge strengthen pro-environmental self-identity.

### Research implications

In terms of practicalities, the findings of this study provide guidance for environmental activists, that the intensified ecological behavior, need to consider strengthening the identity of pro-environmental and ecological value, as both were able to push the ecological intentions. Ecological knowledge should be given, as this study indicates that the influence on the ecological intentions reinforced by learning about the environment.

Theoretically, this study has provided a model of ecological intentions in the context of Indonesia. That intention is influenced by ecological values and pro-environmental self-identity.

### Referral Future Research

Some drawbacks of this study is that the study did not examine the moderating effects of gender and of learning about the environment, that are both thought to contribute to the strong / weak influence on ecological intentions. The study used a convenience sampling risk in generalizing the findings. In addition, the need for further research related to the indication that the ecological knowledge strengthens pro-environmental self-identity.

On the other hand, environmental attitude models developed by Kaiser, et al (1999) included the actual behavior (GBI) as a result of ecological intentions, this study did not include the actual variable behavior. This is because this study was designed cross-sectional dimension of time and not longitudinal so it is difficult to gauge the intentions and actual behavior at the same time. However, further research is needed to eliminate the weaknesses that area.

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