THE ENVIRONMENTAL AWARENESS OF HIGH SCHOOL STUDENTS IN HANOI

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Abstract
This article reports on a study of high school students in Hanoi. The author surveyed 600 students from 10 high schools to assess levels of environmental awareness including environmental knowing, concerning and applying. Independent variables included region of school, and the gender of students. Although there are no region and gender differences in environmental awareness, the mediating relationships are found.

Keywords: Awareness, environmental education, environmental knowing, concerning & applying, variables.

1. INTRODUCTION

In this study, the environmental awareness of students in Hanoi’s high schools is evaluated, as measured by students' environmental knowing, concerning and applying. Hanoi capital is similar to many other cities in that it has an environmental education policy of voluntary infusion in high school [1]. It may be argued that Hanoi capital is paradigmatic of national environmental education policy. In fact, environmental education is not as important or as rigorous as traditional courses of study and educational leaders neglected to address environmental education. For those reasons, the environmental awareness of students is investigated. The purpose of this research was to measure environmental knowing, concerning and applying in high school students. Based on interview method the author hypothesized that the students’ environmental knowing would be lower in comparison to other variables. Further, the patterns of interrelationship among variables are tested.

2. MATERIALS AND METHODS

2.1. Materials

The author designed a questionnaire to be answered by high school students in Hanoi. This questionnaire sought (a) demographic information about the respondent; (b) the student’s awareness of environmental issues including environmental knowing, concerning and applying. The questionnaire contained 17 Likert-type 5 points scale questions. The author pretested the original version on several classes and removed, relocated, or revised questions that were too easy or difficult. Most students completed the questionnaire in about 25 minutes.

2.2. Methods

To best understand and interpret the data, a series of indexes was developed. These indexes grouped questions by type of knowledge or information. The questions were derived from topics covered in textbooks and real life.

Concerning Score: Likert-type items asking if a respondent agrees or disagrees with a statement concerning the degree of environmental problems; 7 items sought levels of concerning about the environment. Summary scores could range from a high of 35 to a low of 7. The degree of environmental problems refers to the extent and severity of issues that are negatively impacting our environment. These problems can vary in scale and impact, and they can encompass a wide range of issues, including pollution, habitat destruction, climate change, resource depletion, and biodiversity loss. The degree of environmental problems can vary by region and is influenced by factors such as population density, industrial activity, and government policies. It is crucial to monitor and address these problems to protect the health of the planet and future generations. Sustainable practices, conservation efforts, and global cooperation are essential in mitigating and ultimately reducing the severity of these environmental issues.

Knowing Score: Six other Likert-type items measuring levels of knowing about the environment. Summary scores could range from a high of 30 to a low of 6. Levels of knowing about the environment can be categorized into several stages or degrees of awareness and understanding. These levels represent the depth of knowledge and engagement of individuals or societies regarding environmental issues. Levels of knowing about the environment illustrate the spectrum of awareness and understanding that individuals and societies can have. Moving from lower levels to higher levels often involves education, exposure to environmental issues, and a personal commitment to making positive changes for the environment. Ultimately, a higher degree of environmental awareness and knowledge is essential for addressing pressing global challenges and protecting the Earth's ecosystems.

Applying Score: Four other Likert-type items measuring levels of applying the environmental knowledge in school. Summary scores could range from a high of 20 to a low of 4. In educational settings, there are various levels at which environmental knowledge can be applied. These levels reflect how schools and educators incorporate environmental education into their curricula and activities. The level at which environmental knowledge is applied in schools can vary depending on the school's resources, mission, and commitment to environmental education. Regardless of the level, incorporating environmental knowledge and practices into education is essential for fostering environmentally literate and responsible citizens who can contribute to a more sustainable future.
The questionnaire was administered in 10 high schools; 600 students participated in the survey. To counteract potential bias, author stratified the sample by drawing on both city and suburban schools. He did this to evaluate whether the community or the type of school influenced students’ knowing and concerning about the environment. The sample showed broad demographic variation. Among respondents, 68% were female and 32% were male. Fifty-two percent grew up primarily in the city, 48% in the suburban. The data is analysed by using both SPSS and AMOS version 23.

2.3. Theoretical background

Mean equation: \[
\bar{x} = \frac{x_{1n1}+x_{2n2}+x_{3n3}+...+x_{knk}}{N}
\]  
Correlation: \[
r = \frac{n(\Sigma xy) - (\Sigma x)(\Sigma y)}{\sqrt{[n\Sigma x^2 - (\Sigma x)^2][n\Sigma y^2 - (\Sigma y)^2]}}
\]

3. RESULTS AND DISCUSSION

3.1. Measurement results obtained by Factor analysis

Assuming that identifying latent variables that account for the correlations among measured variables is the goal of the research. As researchers, author decided to use the structural equation modelling analysis [2] in this research. Both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) are used. The model tested was a relatively simple model with 3 latent factors (Concerning, Knowing, Applying) and 17 measured variables. Correlations and descriptive statistics for the factors are presented in the table below (Table 1).

<table>
<thead>
<tr>
<th>Factors</th>
<th>Mean</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Concerning</td>
<td>3.9</td>
<td>0.70</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2. Knowing</td>
<td>3.5</td>
<td>0.87</td>
<td>0.63**</td>
<td>0.55**</td>
<td>0.61**</td>
</tr>
<tr>
<td>3. Applying</td>
<td>3.8</td>
<td>0.75</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Note: ** Correlation is significant at the 0.01 level (2-tailed). N = 600.

As indicated in the Table 1, Knowing score is lower in comparison to other variables: Concerning and Applying. In other words, Concerning and Applying levels were significantly higher than Knowing levels. The mean level of Concerning was 3.9; for Knowing, 3.5; and for Applying, 3.8. There are no region and gender differences in environmental awareness of the high students.

As the correlations in Table 1 show, Concerning was positively correlated with each of the other factors. The correlations ranged from a low of 0.55 to a high of 0.63. The correlation between Knowing and Applying was 0.61. This indicates that when the Knowing quality was good, students tend to apply it to the reality.

3.2. Mediating relationships

The important point for mediating relationship is that a third variable plays an important role in governing the relationship between two other variables. Baron and Kenny (2009) argued that for us to claim a mediating relationship, we need to first show that there is a significant relationship in the direct pathway [3] between the independent variable (Knowing) and the dependent variable (Applying).

3.2.1. Direct pathway

![Figure 1. The relationship between Knowing and Applying (e1 is exogenous variable)](image)

The regression coefficient for the direct pathway Knowing on Applying is 0.61. In this case, it is also correlation between Knowing and Applying.
3.2.2. Indirect pathway

The next step is to show that there is a significant relationship between the independent variable and the mediator (Concerning). Then we need to show that there is a significant relationship between the mediator and the dependent variable.

The regression coefficient for the direct path Knowing on Concerning is 0.63, whereas the regression coefficient for the direct path Concerning on Applying is 0.26. Then the regression coefficient for the indirect path Knowing on Applying as product of single paths: $0.63 \times 0.26 = 0.16$. If Knowing changes by one standard deviation, then Applying changes by 0.16 standard deviations via Concerning. The total path as product of sum up direct path and indirect path: $0.45 + 0.16 = 0.61$.

![Figure 2. Mediating role of Concerning in explaining the relation between Knowing and Applying](image)

These three conditions require that the three paths (involving Concerning, Applying, and Knowing) are all individually significant. The final step consists of demonstrating that when the mediator and the independent variable are used simultaneously to predict the dependent variable, the previously significant path between the independent and dependent variables is now greatly reduced (partially mediating relationship), if not nonsignificant.

3.3. Discussion

The data revealed that Hanoi high students are well aware of and concerned about environmental problems but have weak substantive knowing about environment. These students would like to have more environmental instruction, which they also believe will be useful for their future life.

It is believed that effective environmental education must be offered in a required course. An appropriate environmental education curriculum should have the following features:

- It should be multidisciplinary, drawing relevant knowledge from both the natural and social sciences as well as humanities.
- It should involve learning basic concepts so that students will not make errors in analysis. Students must learn to integrate materials and think holistically [4].
- It should be problem oriented and should address environmental problems that students encounter in their daily lives.
- It should involve value clarification and moral reasoning in discussions about problems so that students can better understand various actors in environmental controversies and can clarify their own values [5].
- It should address both local environmental issues and global environmental problems.

4. CONCLUSION

This research indicates that environmental awareness of high school students in Hanoi is quite high. The environmental Knowing is low among them, but their levels of environmental Concerning and Applying are higher. There are no region and gender differences in environmental awareness. The effect of Knowing on Applying is partially mediated by Concerning.

ACKNOWLEDGEMENTS

The research funding from Basic Science Research Program through the Hanoi National University of Education and Hong Duc University was acknowledged.
REFERENCES


