

## **Environmental Knowledge, Attitudes, And Practices for Behavior Change of University Students: The Case of Indonesia**

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### **ABSTRACT**

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Environmental knowledge has been learned formally in schools including universities and informally through lineage, the community, and the media. Knowledge, attitudes, and practices is a survey technique used to measure the phenomenon of human life as well as its impact on behavior and how it contributes to environmental management. The objective of this research is to examine the relationship between university students' environmental knowledge and attitudes, practices, and their contribution to behavior change. It was conducted at Indraprasta University PGRI-Jakarta, Indonesia, with a sample size of 137 students, 49 undergraduates of biology education, and 88 postgraduates of mathematics and natural science. In addition, the data analysis method used is a Statistical Non-parametric Bivariate Pearson Correlation. The research concluded that 63 percent of students learned environmental knowledge formally from schools, 15 percent from non-formal education, and 22 percent by both formal and non-formal means. Moreover, the students' understanding did not contribute to their attitude but encouraged their practices significantly. Furthermore, their attitude did not influence the implementation within their real life, but those who practice the information can promote environmentally friendly behaviors.

**Keywords:** Environmental; Knowledge; Attitude; Practice; Behavior Change

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## INTRODUCTION

The environment is critical for both biotic and abiotic survival, but it is plagued by numerous crises. Population growth causes poverty and environmental damages (Tariq & Aziz, 2015), including water, air, and soil pollution, where marginalized people often receive more impact. Moreover, natural resource extraction increases energy consumption which also harms the environment (Hussain, Haseeb, Tvaronaviciene, Mihardjo & Jermsittiparsert, 2020), impacting human life. Likewise, the conversion of natural forests to agricultural lands contributes to plantation loss, and many anthropogenic activities in tropical forested countries give rise to fragmented landscapes (Meyer, Struebig & Willig, 2016). The international community has been fully aware of the importance of this environmental knowledge for sustainable development as mandated by the World Conference on the Environment in Rio de Janeiro, in 1972.

Unfortunately, the demand for natural resources and the use of products continues to increase. Therefore, the environmental impacts are becoming more complex and substandard. Having information about the environment can assist in managing human behavior to become more eco-friendly (Wu, Cheng & Zhang, 2020). Environmental knowledge can help comprehensively in understanding the relationship between human activities and ecological problems (Shimaoka, Kuba, Nakayama, Fujita & Horii, 2016). However, due to different experiences and educational backgrounds, people have varying levels of proficiency regarding these issues. Students can gain this knowledge formally at school, meaning it can be incorporated into subjects to make the information relevant and easier to understand in daily practices. Additionally, it can be learned informally from the interactions within the family and society. They can absorb it from television, magazines, newspapers, and current digital information sources. Otherwise, some countries have a range of programs and curricula on ecological education, which are compulsory for undergraduate students of biology, arts, science, and commerce, including integrating textbooks with environmental concepts (Verma & Dhull, 2017). It is also mandatory for postgraduate students to do environmental education in Indonesia.

The knowledge, attitudes, and practices implemented continuously will reflect good behavior in reducing environmental problems. An increase in environmental knowledge has a significant effect on one's attitude (Fabrigar, Petty & Smith, 2006). Besides, an attitude is a tendency to think, have feelings or preferences about an object based on their beliefs, which can be positive or negative (Kususanto, Fui & Lan, 2012). Also, this education will provide people with skills, good attitudes, and practices to create appropriate solutions to solve environmental issues (Sadik & Sadik, 2014). Moreover, behavior change encourages people to protect the environment, create awareness of their daily habits and establish practices of environmentally sound activities.

### *Problem of research*

Knowledge about the environment in Indonesia is quite good (Nastuti & Lelfita, 2020), even though the understanding related to waste and marine debris is still inadequate. There are many issues regarding climate change and political debates internationally but still a

lack of effort to reduce emissions at the field level. According to Boca & Saraçlı (2019), there was no difference in attitude between students who studied environmental education in protecting the environment and those who did not. Many people want to save the earth, but they ignore preserving the environment. At the beginning of 2020, floods shocked Indonesia and there were haze plus forest fires in both Indonesia and neighboring countries. People failed to prepare for these disasters because of their ignorance of the environment's safety (Firdaus, 2020). According to Djuwita & Benyamin (2019), environmental education is critical to developing pro-environmental behavior, but it is still uncertain if the knowledge contributes to positive outcomes, especially in Indonesian schools.

### ***Research focus***

The focus of this research was on the environmental issues of waste found around the student living areas, greenhouse gases that significantly contributed to climate change and ocean debris which is already an ecological problem in Indonesia.

## **METHOD**

### ***General background***

The objective of this research was to examine the relationship between students' environmental knowledge and attitudes, practices, and how they may contribute to behavior change. It investigated the relationship between students' knowledge and attitude, knowledge and practice, attitude and practice, as well as practice and behavior change. The research questions were (1) How is the university students' environmental knowledge? (2) How is the university students' environmental-based attitude? (3) How is the university students' environmental-based practice? and (4) What is the relationship between environmental knowledge, attitudes, practices, and behavior change?

### ***Sample of research***

The research took place in the Indraprasta University Jakarta with a sample size of 137 students, stratified by two levels of education. The population comprised 49 4th semester undergraduate students in biology education and 88 2nd semester postgraduate students in mathematics and natural science.

### ***Instrument and Procedures***

The research instruments used for environmental knowledge were waste, greenhouse gases, and ocean debris, measured with the Likert Scale. There are two Likert Scale options: 1 for not agree/do not know, and 2 for agree/very agree/know. These implements were organized into questionnaires and sent to the students in a Google form. Table 1 shows the research questionnaires developed based on a study by Ahmad et al. (2015).

**Table 1.** The questionnaire used in KAP survey.

Number	Question
Q1	I learned environmental knowledge from (a) formal education in school/university, (b) non-formal education (training, course, discussion), (c) both
Q2	Waste resulted from human activities is unavoidable. (a) not agree, (b) do not know, (c) agree and very agree
Q3	Ocean debris is a hazardous waste to the ocean biotic life. (a) not agree, (b) do not know, (c) agree and very agree.
Q4	Green House Gases emission is harmful to human life. (a) not agree, (b) do not know, (c) agree and very agree.
Q5	What do you know about ocean debris?
Q6	What do you know about a waste bank?
Q7	A waste bank is an important source to support the family economy. (a) not agree, (b) do not know, (c) agree and very agree.
Q8	A community can learn environmental waste management from field school. (a) not agree, (b) do not know, (c) agree and very agree.
Q9	Neighborhood institution (RT) takes responsibility for managing waste around my house. (a) not agree, (b) do not know, (c) agree and very agree.
Q10	I give my full attention to the cleanliness of my residential areas (a) inattention, (b) very considerate.
Q11	Waste collected from my residential area will be burnt, thrown away, or treated. (a) do not know, (b) I know
Q12	I do waste processing conversions into fertilizers or/and other recycled products. (a) never done, (b) have done.
Q13	I have the confidence to solve the waste problems in my house and its surrounding areas. (a) not confident, (b) very confident.

### *Data Analysis*

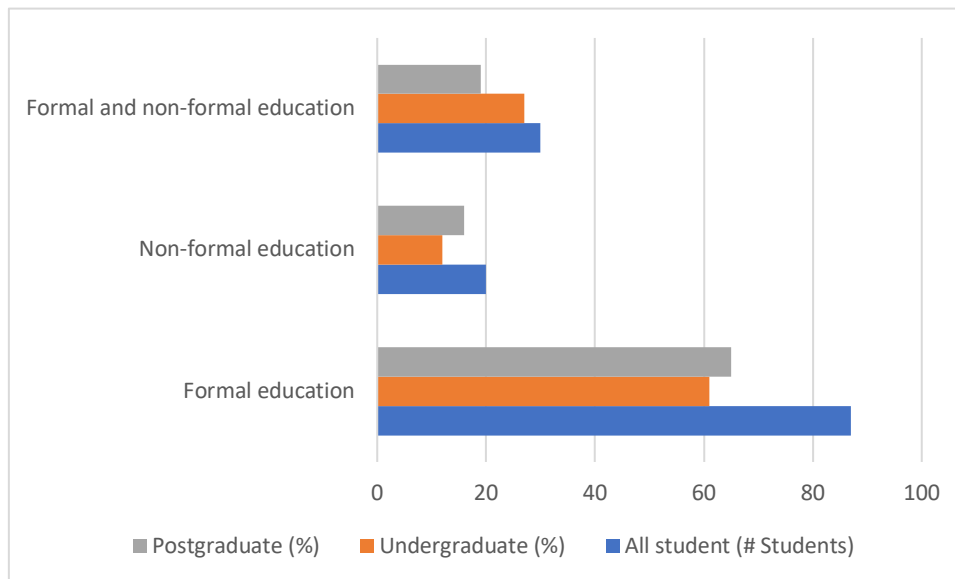
Data from the questionnaires were presented in tables along with graphs and tested using a Non-parametric Bivariate Pearson Correlation Test with SPSS Statistical Software Version 23.

## RESULTS AND DISCUSSION

### Results

The total number of respondents used for this research was 137, with 68.6 percent females and 31.4 percent males. Ranging from the ages 17-25 years were 47.5 percent, the remaining were 26-35 years of 29.9 percent and more than 35 years being 22.6 percent. Most of the participants (64.5 percent) were postgraduate students, and the remaining 35.5 percent were undergraduate students.

Sixty-three percent of students learned environmental knowledge from a formal study in school, 15 percent from non-formal, and the remaining 22 percent from both formal and non-formal. Magister students gained the understanding formally (65 percent) more than undergraduates (61 percent). However, 27 percent of those students learned both formally and informally more than postgraduates of 19 percent (Figure 1).



**Figure 1.** How students learned the environmental knowledge

Students' environmental knowledge varied according to their prior study backgrounds and experiences. Eighty percent of students thought that waste is unavoidable (Q2). Then, sixty-six percent believed ocean debris was dangerous for biotic organisms living in the sea (Q3). Also, they felt that greenhouse gases contributed to harmful effects on human life of 89 percent (Q4), and 91 percent understood that the waste bank creates the family income (Q7). Likewise, ninety-one percent assumed field schools could teach students waste management (Q8), and 75 percent of students stated that the neighborhood institution (RT) is not only responsible for waste management (Q9). Figure 2 shows the students' environmental knowledge.

Additionally, undergraduate students believed that the waste bank helps the family economically more than postgraduates (Q7). They agreed more than undergraduates that waste is unavoidable (Q2), ocean debris is harmful to the life of biotic organisms in the sea (Q3), the emission of greenhouse gases damage human life (Q4), field schools can teach students about waste management (Q8), and RT is not the only responsible institution for waste management (Q9). Figure 2 conveys the environmental knowledge of undergraduate and magister students.

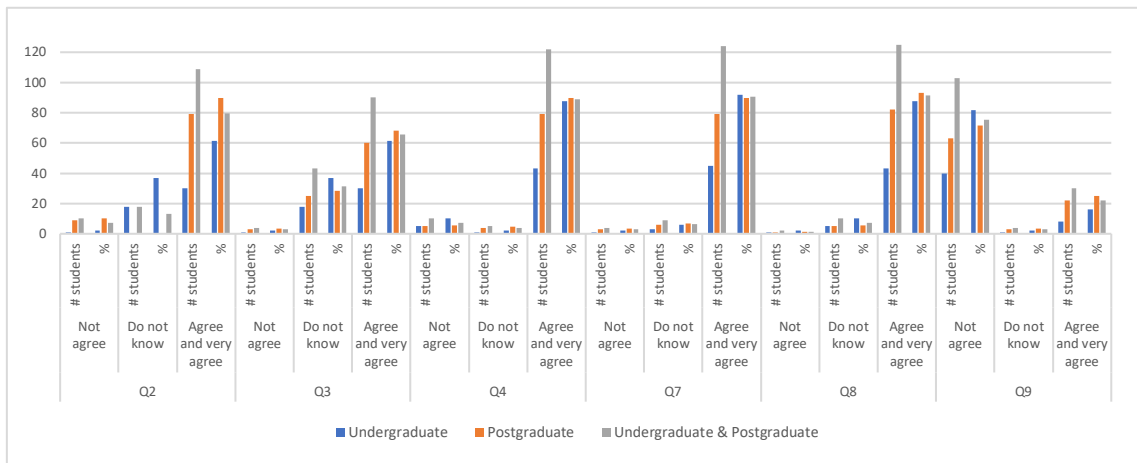


Figure 2. Environmental knowledge of students

In response to the in-depth questions, 69 percent of students had difficulties in elaborating their knowledge on ocean debris (Q5), and 91 percent on the waste bank (Q6), shown in Figure 3. According to figure 3, 67 percent of undergraduates and 70 percent of postgraduates also had challenges elaborating their knowledge on ocean debris (Q5). Meanwhile, 88 percent of undergraduate students and 92 percent of postgraduate students had an issue elaborating the waste bank (Q6).

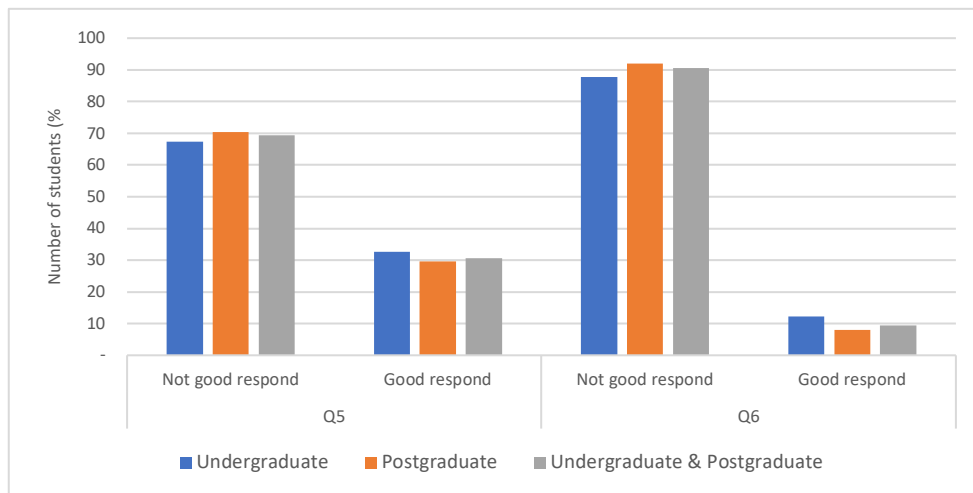
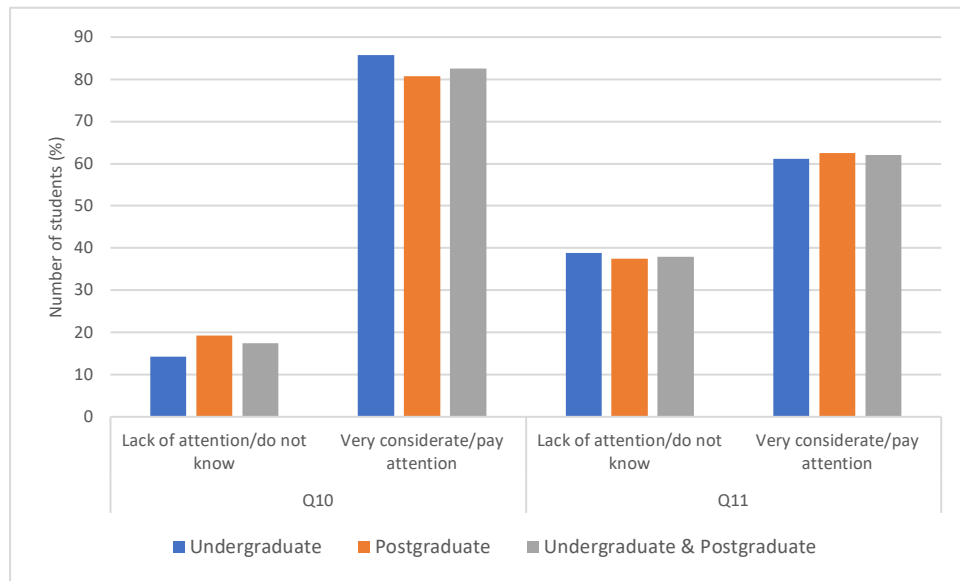


Figure 3. Environmental knowledge of the student in responding to the open questions

Figure 4 shows that 82 percent of students gave serious attention and confidence to maintain the cleanliness of the household and its surrounding area (Q10), and 62 percent of students know how waste is handled in their environment (Q11). Figure 4 also conveys that 86 percent of undergraduate students and 81 percent of postgraduate students were concerned about the cleanliness of their housing area (Q10). Furthermore, 61 percent of undergraduates and 63 percent of postgraduates know how to handle waste in living areas (Q11).



**Figure 4.** The attitude of the students on environmental care

People can turn waste generated as a by-product of human activities into valuable products by recycling it. As shown in Figure 5, 62 percent of students had prior experience processing waste into beneficial goods, such as fertilizer (Q12). Figure 5 reveals that 66 percent of postgraduate students had more experience recycling waste into more useful materials than undergraduate students of 55 percent.

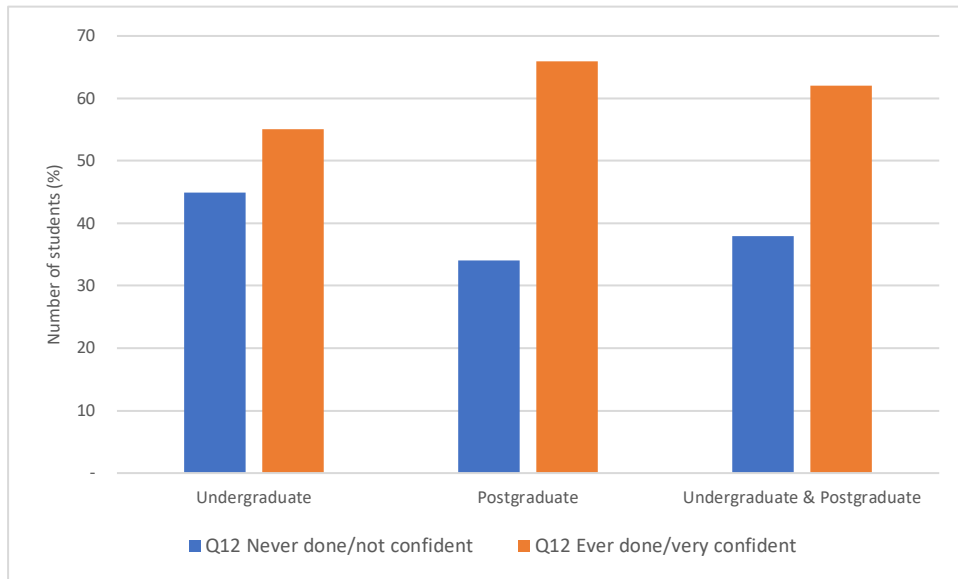


Figure 5. Students’ environmental practice in daily life

Figure 6 expresses that only 42 percent of students had the self-confidence to manage waste problems surrounding their household (Q13). Meanwhile, the remaining 58 percent did not have confidence and never undertook any activities to reduce the waste (Q13). Moreover, figure 6 shows 60 percent of postgraduate students had self-confidence, higher than 40 percent of undergraduate students.

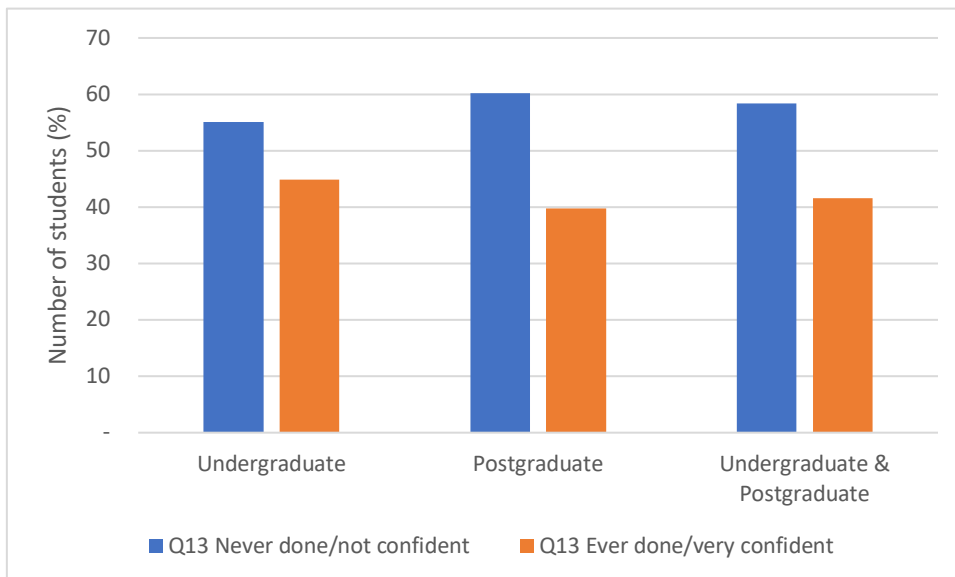


Figure 6. Students’ behavior changes to protect the environment



## DISCUSSION

This research underlined that most students learned environmental knowledge formally from school, and postgraduate students learned formally more than undergraduates. Incorporating environmental education into the school curriculum enhances awareness (Erhabor & Don, 2016), and this creates a more comprehensive treatment of ecological problems (Jekayinfa & Yusuf, 2008).

Many students knew that waste is produced continuously and can be reduced as well as processed into valuable materials, and some more than others understood that ocean debris and greenhouse gas emissions are ecological problems. Also, they learned about field schools, waste banks and agreed not to rely on RT to manage waste. Additionally, the postgraduates knew better than the undergraduates about waste, ocean debris, greenhouse gas emissions, field schools, and the role of RT. Undergraduate students had better knowledge than magister students on a waste bank. Unfortunately, most had difficulties elaborating their knowledge in response to the open question.

Theoretically, a higher education level would have a greater grasp and experience in the field. This, however, is not always the case. Around 80 percent of students paid close attention and had confidence in maintaining the cleanliness of the household and its surroundings, with undergraduate students giving more attention than postgraduate students. However, only 62 percent gave awareness to waste handling (postgraduates more than undergraduates). Furthermore, just 62 percent of students had prior waste processing experience (postgraduate students with more confidence and knowledge). Indeed, students' self-confidence aids their understanding of the problem, but the level of education did not guarantee assertiveness. Individuals with higher self-confidence are more motivated to engage in ways in which they are confident (Greenacre, Tung & Chapman, 2014), and confidence create supportive conditions for behavior change (Young, Davis, McNeill, Malhotra, Russell, Unsworth & Clegg, 2013).

The Non-parametric Bivariate Pearson Statistical Test examined the relationships within parameters (environmental knowledge, attitudes, practices, and behavior change). Pearson and Spearman correlation coefficients range between -1 to 1, with a 0.0 indicating no correlation; the effect is low if the correlation is around 0.1, medium if 0.3, and large if more than 0.5 (Cohen, 1988). The relationship between environmental knowledge and attitudes was not significantly linear, with a weak correlation of  $r = 0.110$ ,  $n=137$ ,  $p = 0.202$ . Moreover, the same result occurred at the University of Benin in Nigeria (Erhabor & Don, 2016) and in a secondary school at Kajangtown, Selangor, Malaysia (Aminrad, Zarina, Hadi, & Sakari, 2013). Further, students with good environmental knowledge gave strong positive ecological attitudes and good environmental behavior in Oman (Al-Rabaani & Al-Shuili, 2020). Likewise, an outdoor learning process could develop students' awareness and contribute to their thinking (Bogner, & Wiseman, 2004). Formal education does not always influence attitudes, therefore, it is recommended to combine such with outdoor classes.

Environmental knowledge teaches students new skills, assists in problem-solving, supports their day-to-day lives, and aids in dealing with ecological issues in their surroundings. The

understanding may come from the media, educational institutions, and families to encourage environmental-sound practices (Ahmad, Shuhaida, & Ismail, 2015). This research found a significant linear relationship between environmental knowledge and practices, with a weak correlation of  $r = 0.225^{**}$ ,  $n = 137$ , and  $p = 0.008$ . It means that students' knowledge helped in field implementation.

Meanwhile, no correlation was found between attitudes and field practices. The relationship between students' attitudes and practices was insignificant, with  $r = 0.026$ ,  $n = 137$ , and  $p = 0.761$  indicating a weak correlation. That is, students may engage in environmentally friendly activities without being aware of them. Due to one's attitude being one of the most important success factors in providing environmental solutions (Esteban, Ferrer, Vicente, Muñoz, Claros, Javier, & Ruiz, 2020), it is suggested that students' attitudes be improved.

The association between students' practices and behavior change was a highly significant linear with a medium correlation of  $r = 0.325^{**}$ ,  $n = 137$ ,  $p = 0.000$ . The more students who implement good practices in the field, the better their behaviour to practice activities consistently. Personal beliefs, which influence pro-environmental actions, also affect individual intentions to practice environmentally responsible behaviours (Wu, Cheng & Zhang, 2020).

## CONCLUSION

Protecting the environment is critical for saving living organisms and human existence, as well as ensuring a higher quality of life for future generations. University students have a challenging responsibility to protect the environment by developing good environmental knowledge, attitudes, and practices to change their behaviors to become more environmentally friendly.

Accordingly, the findings of the study showed that 63 percent of students received formal environmental knowledge from schools, 15 percent from non-formal education, and 22 percent from both formal and non-formal teaching. Students' knowledge did not influence their attitudes, but it did significantly encourage their practices. Furthermore, their attitudes did not affect their actual application in real life, but those who put their environmental knowledge into practice can contribute to environmentally friendly behaviors.

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