

Awareness and Practices on Solid Waste Management among Elementary Pupils: Implications or Makakalikasan Core Value

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Abstract

The school sector still faces difficulties in enforcing adequate solid waste management. To address this issue, this study investigated the level of awareness and practices on solid waste management among intermediate elementary pupils. To do so, this study employed the quantitative research design using descriptive and correlational methods. Using stratified random sampling, primary data were gathered through the use of printed survey questionnaires addressed to one hundred eighty-six (186) respondents who are intermediate elementary pupils. In addressing the hypotheses of the study, correlation analysis using Spearman's RHO test was used. The data showed high levels of awareness, particularly regarding environmental care and resource utilization. The practices were rated high, with segregation being very high. The Spearman rho correlation showed a moderately positive association between awareness and waste management practices. Based on the findings, the researchers recommended creating a school symposium on solid waste management and core values, implementing a "Basura Mo, Pagkakitaan Mo" program for proper disposal, and conducting a comparative study on the difference in performance between males and females in terms of awareness and practices on solid waste management.

Keywords: elementary pupils, solid waste management, descriptive-correlation

Introduction

Laying a solid foundation for children in their early years is the first step towards establishing lasting values. Social norms are founded on values, which direct how society makes decisions. With the development of core values, schools play a crucial role in upholding these ideals by encouraging close bonds between instructors and students (Gökçe, 2021). As a result, teachers are obligated to help their students understand and uphold these fundamental principles (Desamparo & Barrameda, 2019). However, in the public schools of the Philippines, problems with the long-term application of these fundamental principles jeopardize the conduct of the pupils. The limited contact between instructor and student in the new learning mode during the pandemic further undermines the sustained awareness and practice of

essential values, leaving these fundamental values unregulated and unsupervised (Verdejo, 2021; Ortigas & Pendon, 2016; Cena & Bual, 2021; Bual & Madrigal, 2018; Ancho, 2020, as cited by Garcia & Bual, 2022). To bridge the gaps in Makakalikasan awareness and practices, the Department of Education (DepEd), in line with one of its guiding principles, Makakalikasan core value, has strengthened and reinforced the integration of environmental education into the curricula for elementary and high schools (Montemayor, 2019). Section 55-56 of RA. 9003 posited that the national government intends to incorporate environmental issues into school curricula, emphasizing waste management principles like resource conservation, segregation, reduction, recycling, reusing, and composting. This will be done in collaboration with agencies, NGOs, and private institutions (Molina & Catan, 2021). As per DepEd Order No. 5, s. 2014, to achieve the DepEd's goals for biodiversity conservation, prevention, and adaptation to climate change, among other things, the National Greening Program (NGP) implemented solid waste management regulations. Additionally, the DepEd is required by RA 9003, Part 6, Rule 21, in Section 2, that ESWM will be actively implemented in the center of the learning system in all grade levels, with prominence on promoting student, faculty, and administrative participation in school-wide and neighborhood waste management projects (Valladolid & Blasé, 2023).

Socio-cultural theory of Lev Vygotsky (1978), Vygotsky's theory emphasizes how crucial social interactions are in a child's cognitive development. He proposed scaffolding, where an adult or skilled child guides a child's learning experience by capturing interest, demonstrating the best tactic, and adjusting the process to their developmental stage. This approach helps children master challenging tasks with assistance. The theory of Lev Vygotsky marks dominance on the value of social interaction in promoting growth and the impact of active learning and constructivist learning approaches on environmental education. These strategies should be frequently applied in environmental education initiatives.

The impact of social contact, specifically on an individual's cognitive abilities, especially at higher skill levels, is highlighted by sociocultural theory. Human learning is essentially a social activity. The sociocultural idea states that mentors such as caregivers and educators have a function in directing the psychological development of individuals. Individuals' views and values may develop as a result of their participation in social and cultural events. It also highlights the impact that cultural beliefs and attitudes have on people's learning process (Main, 2023).

To realize the socio-cultural theory of Lev Vygotsky, Edward Thorndike proposed another theory inclined to socio-cultural theory, which is the theory of connectionism under the theory of connectionism are the three laws which are the law of effect, exercise, and readiness. The law of exercise is best linked to the socio-cultural theory. In the law of exercise, there are two different types of laws make up the law of exercise: the law of use, which states that if training is done, the relationship will strengthen; and the law of disuse, which states that if the exercise is stopped, the relationship will weaken or be forgotten. According to this law, whether or not children learn something depends on how much and how well they are given an activity (Surur, 2021).

In this study, the researchers determined the awareness and practices on solid waste management level among elementary pupils. Moreover, this study measures the relationship between the awareness and practices on solid waste management among elementary pupils and its implications to makakalikasan core values. The findings of this study will assist students at Kiblawan Central Elementary School in developing sustainable habits that engage with the community, protect the environment, and align with the Sustainable Development Goals of the United Nations. Also, this will help the Kiblawan Central Elementary teachers, as this can give them insights on the school projects and programs, they can utilize

to maintain and increase the awareness and practices on solid waste management among elementary students.

Objectives of the Study

The primary objective of this research is to determine the awareness level and practices of elementary pupils of Kiblawan Central Elementary School. Specifically, this study aimed to:

1. To determine the awareness level of elementary pupils towards solid waste management in terms of:

- 1.1 takes care of school materials, facilities, and equipment;
- 1.2 shows a caring attitude toward the environment; and
- 1.3 cares for the environment and utilizes resources wisely, judiciously, and economically.

2. To determine the level of practices on solid waste management of elementary pupils in terms of:

- 2.1 performs 3r's;
- 2.2 segregation;
- 2.3 disposals.

3. To determine if there is an existing significant relationship between the awareness and practices on waste management among elementary pupils.

4. To identify the implications of the findings to instill the Makakalikasan core value.

Methodology

Respondents. The study used stratified random sampling in determining the respondents of the study. In choosing the research respondents who will take part in answering the survey questionnaire on the awareness and practices on waste management among elementary pupils: implications for Makakalikasan core values, one hundred eighty-six (186) samples lay hold of in strict compliance with the following inclusion criteria: (1) Students enrolled in intermediate grade levels (2) A bona fide student of Kiblawan Central Elementary School enrolled for the school year 2022-2023. The respondents have the right to withdraw from the study; however, withdrawal the day before the final defense will not be accepted.

Table 1
Gender distribution of the 186 intermediate pupils included in the study

Grade Level	Male	Female	Total
4	28	30	58
5	34	40	74
6	26	28	54
Total	88	98	186

Instruments. The study used an adapted research questionnaire. A survey questionnaire developed from the DepEd Division of South Cotabato (2021), Paghasian (2017), and Pantao (2020) study was the research tool employed in the study. Some questions or remarks go along with each indicator. Responsible dominion over material things has ten questions, caring for the environment has six

questions, and conserving energy and resources has two questions. Thus, in awareness of solid waste management, a five-point Likert scale, with one being the lowest and five being the highest, was used to poll the respondents.

Table 2
Mean Score Interpretation

Mean Range	Interpretation	Description
4.20-5.00	Very high	This measure indicates that the items relating to the solid waste management awareness of students embodied in the item were always present.
3.40-4.19	High	This measure indicates that the items relating to the solid waste management awareness of students embodied in the item were sometimes present.
2.40-3.39	Moderate	This measure indicates that the items relating to the solid waste management awareness of students embodied in the item were often present.
1.80-2.59	Low	This measure indicates that the items relating to the solid waste management awareness of students embodied in the item were seldom present.
1.00-1.79	Very Low	This measure indicates that the items relating to the solid waste management awareness of students embodied in the item were absent.

Meanwhile, the second set of questionnaires focused on the elementary school kids' knowledge of and behavior on garbage management adapted from Paghasian (2017), with measures of three indicators, namely: Performs 3R's has (3) questions, Segregation (3) questions, Disposal (3) questions. Thus, in awareness and practices on waste management. A five-point Likert scale, with one being the lowest and five being the highest, was used to poll the respondents:

Table 3
Mean Score Interpretation

Mean Range	Interpretation	Description
4.20-5.00	Very high	This measure indicates that the items relating to the practices on solid waste management of students embodied in the item were always present.
3.40-4.19	High	This measure indicates that the items relating to the practices on waste management of students embodied in the item were sometimes present.
2.40-3.39	Moderate	This measure indicates that the items relating to the practices on solid waste management of students embodied in the item were often present.
1.80-2.59	Low	This measure indicates that the items relating to the practices on solid waste management of students embodied in the item were seldom present.
1.00-1.79	Very Low	This measure indicates that the items relating to the practices of students on solid waste management embodied in the item were absent.

In order to ensure the validity and reliability of the instruments used, the researchers conducted a validity and reliability test. The researchers lay hold of 40 respondents to take part in the reliability test with a total number of items 18. The reliability test results show that the instruments used by the researchers were very reliable with a Cronbach's Alpha value of .896.

Design and Procedure. The study used a descriptive-correlational research design, which employs a quantitative research methodology. Using this research approach is beneficial as this study explores the connection between awareness and practices on solid waste management among elementary pupils. According to Reddy (2019), quantitative research investigates a phenomenon using numerical data and mathematical, statistical, or computational techniques. Through quantitative research, researchers can learn more about a particular group. The procedure for doing quantitative research involves gathering and analyzing numerical data. According to Bhandari (2021), a correlational study strategy examines connections between variables. When two (or more) variables are correlated, it shows the intensity and direction of their relationship. It is simpler to anticipate and explain how variables connect using the non-experimental research approach known as descriptive correlational research (Quaranta, 2017).

The researchers carried out data-gathering techniques to get the data required for the investigation. Through the following steps, the data was obtained. First, the researchers complied with the data gathering requirements of UM Digos RPC, the data gathering requirements include; validated questionnaires, a polished method, a letter of permission, and an assent form. Second, the researchers submitted the letter of permission to the division office together with the polished method, and questionnaire and submitted it online through the division office portal. Third, the researchers submitted another letter of permission, validated questionnaire, and polished method to the local school principal. Fourth, the data gathering took place and the researchers were distributed and assisted by the classroom advisers at each grade level. Before the respondents took the survey, the researchers gave them assent forms. Lastly, after the filling up of questionnaires by the respondents, the researchers started to analyze the data. Mean and Spearman's RHO was used in the data analysis of this study. The mean is used to get the average score of the students for each statement and indicator. The mean is a logical statistic that is very stable. A foundational tendency of a phenomenon is also indicated by the methods (Ali, 2021). Meanwhile, the Spearman RHO was utilized by the researchers to measure the correlation level of the variables with a null hypothesis $H_0 p > 0.05$. Spearman's rank correlation assesses the degree and direction of association between two ranked variables (Gupta, 2023).

Ethical Considerations

The study complied with ethical guidelines, got approval from school administrators, located potential recruiters, reduced hazards, and got the appropriate authority and agreement from the study population.

Voluntary Participation. Respondents to the study participate voluntarily, anonymously, and transparently, providing information as requested. To ensure transparency, researchers code responses and preserve respondent identity.

Privacy and Confidentiality. Information from the study will be kept secret and confidential in order to uphold the participants' rights.

Informed Consent Process. The study, which has the consent of both respondents and school administrators, makes use of an easily understood survey questionnaire to make sure participants understand the advantages of the research.

Risks. The study concentrated on upholding and safeguarding people's rights without putting them in dangerous situations including health, mental health, or financial issues.

Benefits. The results of the study will help language curriculum directors make critical decisions, improve students' comprehension of social skills, and support teachers in applying innovative techniques.

Plagiarism. Using Grammarly and Turnitin software, the researcher ensures proper citation of ideas from other writers and researchers by doing grammar and plagiarism checks.

Fabrication. The report is meticulously written and meticulously cited from reputable journals and scientific works. It is based on several previous studies, assuring correctness and thoroughness.

Falsification. The APA 7th edition citation format is followed in this study, guaranteeing accurate and comprehensive data and information presentation free from any changes or misrepresentations.

Conflict of Interest. A conflict of interest (COI) arises when a professional's decision-making is unaffected by side interests that could compromise primary goals, such as participant wellbeing, such as monetary or academic benefits or recognitions.

Deceit. Through the avoidance of dishonesty and the assurance that all information is confirmed and evaluated by a panel of experts, this document guarantees the welfare of respondents.

Permission from Organization/Location. Following official authority approval, a formal letter is sent to the selected target subject as part of an ethically compliant and formal research protocol.

Authorship. The researcher and research adviser made substantial contributions to the study's conceptualization, design, data collection, analysis, and interpretation, as well as to its publishing. These contributions are acknowledged in this report.

Results and Discussion

1. Level of Student's Awareness Toward Solid Waste Management

Table 4

Level of awareness on solid waste management of elementary pupils

Indicators	\bar{x}	SD
1. Takes care of school materials, facilities, and equipment	4.10	0.53
2. Shows a caring attitude toward the environment	4.14	0.61
3. Cares for the environment and utilizes resources wisely, Judiciously, and economically	4.55	0.48
Overall	4.26	0.39

Table 4 displays the findings from the descriptive statistics on the awareness of solid waste management level among elementary pupils, which has an overall mean of (\bar{x} =4.26, SD=0.39), described as very high. Cares for the environment and utilizes resources wisely, judiciously, and economically which has a mean of (\bar{x} =4.55, SD=0.48), described as very high. The researchers carried out data collection procedures to get the data required for the study, showed a caring attitude toward the environment (\bar{x} =4.14, SD=0.61), and took care of school material, facilities, and equipment (\bar{x} =4.10, SD=0.53). Taken in general, it is inferred that elementary pupils are very highly aware of the solid waste management program of the school. This moreover implies that caring for the environment and utilizing resources wisely, judiciously, and economically takes the lead could mean that situations about caring

for the environment and utilizing resources wisely, judiciously, and economically are more pronounced among elementary pupils.

The overall level of awareness on solid waste management of elementary pupils is very high, which indicates that elementary pupils have developed environmental consciousness within their self. When the results are examined more closely, they reveal a very noticeable difference in the ratings of the three indicators, suggesting that all respondents had a positive perception of their level of solid waste management awareness across the board. The school was able to provide elementary students with relevant activities or tasks that foster a positive attitude toward the environment, and they comprehend the significance of taking care of the environment as well as the resources, as evidenced by the highest score among the three indicators: cares for the environment and uses resources wisely, judiciously, and economically. On the other hand, elementary pupils were also found to be highly satisfied with the two indicators.

These findings can be compared to the declaration made by Arshad et al. (2021) that environmental awareness is a teaching method that educates individuals about the importance of protecting natural resources and minimizing the negative effects of human activities. (cares for the environment and utilizes resources wisely, judiciously, and economically); According to Yeşilyurt et al. (2020) students' environmental awareness will improve, their environmental sensitivity will grow, and they will develop into individuals with an understanding of the environment through developing an empathy for the natural world. (shows a caring attitude toward the environment); Danielraja (2019) posited that citizens should be educated on environmental preservation, contribute to healthy neighborhoods, and establish environmental ethics to ensure a sustainable future for future generations (takes care of school materials, facilities, and equipment).

2. Level of Student's Practices in Solid Waste Management

Table 5
Level of practices on solid waste management among elementary pupils

Indicators	\bar{x}	SD
1. Performs 3r's	4.09	0.70
2. Segregation	4.31	0.64
3. Disposal	3.82	0.87
Overall	4.07	0.52

Conversely, Table 5 presents the findings from the descriptive statistics used to gauge intermediate student's level of solid waste management techniques. The overall mean of practices on SWM is (\bar{x} =4.07, SD=0.52), rated as being high. The high score may have resulted from primary students receiving mostly moderate ratings on their 3r's performance (\bar{x} =4.09, SD=0.70) and disposal (\bar{x} =3.82, SD=0.87) with segregation (\bar{x} =4.31,SD=0.64), being rated as very high and the only measure assessed very high. In general, it is surmised that the very high level of segregation indicates that the condition associated with practices of segregation among elementary pupils is always present. Furthermore, the high level of performance 3Rs and disposal means that this dimension is sometimes present.

The overall level of practices on solid waste management as perceived by elementary pupils is high, which means that the indicated factors of this variable were observed sometimes. Among the three

indicators, segregation garnered the highest score, which indicates that most elementary pupils always actively practice segregation of solid wastes at school. These findings agree with the study of Amri and Widyanoro (2017) starting waste management habits in children at a young age is crucial for developing their behavior, starting with sorting and organizing waste (segregation). Moreover, Harmawati and DS (2020) stated that the reduce, reuse, and recycle program helps children learn about waste management and recycling, while also promoting environmental conservation. Teachers encourage proper disposal, less paper usage, and caring for plants and animals. Students also learn to distinguish between organic waste management issues and garbage (performs 3r's). Furthermore, Koçak and İkizoğlu (2020) posited that a planned waste management strategy is required to get rid of the waste that must be periodically collected, transported, stored, and disposed of in metropolitan areas in order to safeguard the environment's health before it becomes a significant issue (disposal).

3. Relationship Between Awareness on Solid Waste Management toward Practices on Solid Waste Management

Table 6
Correlation Matrix between awareness and practices on solid waste management among elementary pupils

	Takes care of school materials, facilities, and equipment	Shows a caring attitude toward the environment	Cares for the environment and utilizes resources wisely, judiciously and economically	Overall
1. Performs 3R's	.232** (0.001)	.307** (< .001)	.336** (< .001)	.373** (<.001)
2.Segregation	.305** (< .001)	.312** (< .001)	.626** (< .001)	.538** (<.001)
3. Disposal	.083 (0.258)	.256** (<.001)	.179** (0.014)	.209** (0.004)
8. Overall DV	.246** (<.001)	.396** (<.001)	.469** (<.001)	.470** (<.001)

* $p < 0.05$, ** $p < 0.01$

Displayed in Table 6 are the results of the relationship between the independent (awareness of solid waste management), and dependent (practices on solid waste management). Spearman rho was employed to test the data since it violates the rule of normality. The results show that the indicators from dependent and independent variables showcase significant bearing, except the indicator; takes care of school materials and disposal, $r(186) = 0.083$, $p < 0.001$ as these two variables do not have a significant relationship. Furthermore, a moderately positive relationship between the two variables, $r(184) = 0.470$, $p < 0.001$. Therefore, the null hypothesis is rejected.

The findings of the study are analogous to the findings of the study of Reyes and Madrigal (2020), which states that there will be a significant amount of positive desirable practices towards solid waste management if there is a high level of awareness and a positive attitude.

Furthermore, the results of the main problem of this study, as mentioned in the preceding paragraph, support the theoretical framework anchored on Edward Thorndike's (1910) Theory of Connectionism, which posits that there is a stimulus-response relationship for every activity.

Learning success results from mastering these connections. People should practice often and take part in trials and practice in order to develop these relationships. Repeated behavior improves long-term memory by fortifying the link between stimuli and response. Repetition is the foundation of learning, and it can be reinforced via incentives. Drills are one type of exercise that helps improve the relationship between condition and action. Exercise necessitates the Law of Use and Law of Disuse, which guarantee tight ties between condition and activity (Islam, 2015).

4. Implications of the findings to Makakalikasan Core Value

The implications for the Makakalikasan Core Value were determined by the researchers based on the data presented in the paper's Results and Discussion section. The findings from Table 6, which discussed the level of awareness regarding solid waste management among elementary pupils, indicate that pupils have a very high level of awareness regarding solid waste management. This indicates that pupils have an environmentally conscious mindset and are aware of the benefits and drawbacks of their actions regarding the environment. They also demonstrated how seriously they took the environmental awareness programs in their school, as evidenced by the ratings they provided in the survey.

Moreover, Table 7 presents the level of solid waste management practices among elementary pupils. Based on all results, disposal comes last, yet the data show that the pupils have high levels of solid waste management practices. The researchers deduce that although the students were able to demonstrate an effort to do acts that contribute to a greener planet, they are clearly still having difficulty with disposal. While occasionally noticed and implemented at their school, the disposal component still requires examination and intervention.

Additionally, the researchers found a moderately positive relationship in the correlation matrix between the awareness of and practices for solid waste management among elementary pupils. From the results, researchers conclude that the school has implemented sufficient measures to promote elementary students' awareness of and practices for solid waste management. These results have significant ramifications for the Makakalikasan core value of the students. It is essential to inculcate the Makakalikasan core value in pupils from an early age, as they will carry this value into the old life. Since the school was able to promote solid waste management practices and awareness among elementary students, it can be assumed that the pupils will grow and carry the ideals that the school has taught them with them into old age. The Makakalikasan core value must be implemented with caution going forward since it will influence the behavior of the pupils in the future and how they encourage and lead sustainable lives.

Collaborating with parents and other community stakeholders, we should strive to support the development of an ecologically conscious mindset in pupils and promote the Makakalikasan core value. We can start practicing solid waste management at home, go to solid waste management symposiums in the community and at schools, join groups that actively participate in clean and green programs, and, finally, encourage self-discipline by being mindful of our belongings and garbage.

Conclusion

This study aimed to determine the level of awareness and practices on solid waste management among elementary pupils and the implications to Makakalikasan core values. The statistical data reveals that the students have a very high level of awareness. Care for the environment and utilizing resources wisely, judiciously, and economically were rated very high among the three variables. Takes care of school materials, facilities, and equipment, and shows a caring attitude toward the environment was rated as high by the pupils. Meanwhile, the practices on solid waste management were rated overall with high. Segregation practice was the only indicator that was rated very high and the remaining two indicators which are performed 3r's, and disposal, were rated as high. The Spearman rho correlation, which measures the significance of the association between awareness and practices on waste management among intermediate students, shows a moderately positive association between the awareness and solid waste management practices of intermediate students. The null hypothesis was rejected. This indicates that improved solid waste management techniques are linked to increased awareness.

Recommendation

The data provides meaningful information to all stakeholders of education. Based on the findings, which showed that students' awareness of solid waste management had an impact on their practices, some recommendations for improvement have been made. First, create a symposium with topics about solid waste management and the significance of implementing core values. Second, create a school program for disposal practices “Basura Mo, Pagkakitaan Mo”. In every collection of trash, the classroom that has disposed of its garbage properly will be given an incentive. Third, create a comparative study of the difference in the level of performance of girls and boys on awareness and practices on solid waste management among elementary pupils.

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