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Health consciousness of students and their environmental awareness of WASH-integrated lesson in school program

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Abstract

DepEd Order No. 43 s. 2011 underscores the importance of adopting health and nutrition programs into the curriculum. Hence, Pinagturilan National High School started the WiNS Policy as per DepEd Order No. 10, s. 2016. However, no reports have shown whether the implementation has been positive among students. There is a notable gap regarding implementing and effectively incorporating WASH (Water, sanitation, and hygiene) practices directly into the educational curriculum, particularly in how these initiatives can be effectively taught in classrooms to improve students' health consciousness and environmental awareness. Therefore, this study explored the effects of WASH-integrated lessons in school programs on students' health consciousness and environmental awareness. Experimental research was conducted using a researcher-made module and questionnaire with pre-tests and post-tests among the grade 10 students in control and experimental groups using simple random sampling. The acceptability of the researcher-made module was found to be very satisfactory. Thus, the experimental group performed better in health consciousness and environmental awareness than the control group during the pre-test and post-test. The result shows a significant difference in health consciousness among the students toward WASH. In contrast, environmental awareness shows highly significant differences between both groups. Also, there is a significant difference in the student's performance between the two groups. It is recommended that the knowledge or data set be enhanced to incorporate WASH into health consciousness and environmental awareness to establish the greater value of the effect. This is done by providing realistic and enhanced activities that nurture students' healthy lifestyles and environmental stewardship.

Keywords: WASH, WinS program, health consciousness, environmental awareness, experimental research

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1. Introduction

The Department of Education recognizes that educational facilities serve as physical spaces where interventions aimed at improving the health of the population, age-specific health education, and the adoption of health-enhancing policies take place. Promoting health in these establishments enhances education's influence on Filipino students' growth and progress at different stages of their lives. Meanwhile, the DepEd Order No. 43 s. 2011, entitled "Strengthening the School Health and Nutrition Programs for the Achievement of the Education for All (EFA) and Millennium Development Goals," requires schools to incorporate health and nutrition programs into the curriculum and establish health services and facilities by promoting handwashing, school sanitation, and student hygiene. It also emphasizes the importance of educational institutions, communities, and local governments working together to promote healthy habits and student health. This led the Department of Education (DepEd) and the Department of Health (DOH) to partner to promote water, sanitation, and hygiene (WASH) in schools. This alliance ensures children have clean water, facilities, and hygiene education to improve their physical and mental health. Water, Sanitation, and Hygiene in Schools (WinS) initiatives, which install lavatories, handwashing facilities, and water distribution systems in schools and teach students and teachers hygiene, are part of the collaboration (Pabalan et al., 2018). DepEd and DOH are working to address student health issues and promote healthy school practices. Thus, it is also guaranteed by the UN's 17 sustainable development goals, adopted in 2015, to address the world's biggest problems. These aims require governments, corporations, civic society, and individuals to collaborate for sustainability and equity. The interrelated Sustainable Development Goals (SDGs) address social, economic, and environmental challenges (Krishna et al., 2022). The new goals build on the Millennium Development Goals (MDGs) and address their flaws, such as ignoring interdependence and omitting some demographic groups. DepEd and DOH are linked by SDGs 2,3,6 and 15 on water sanitation and hygiene. As explained by Bain (2019), SDG 2 aims to end hunger, secure food, and promote nutrition.

Proper water, sanitation, and hygiene are needed to prevent diseases that induce hunger and hinder growth. SDG 3 encourages lifespan health. Clean water, sanitation, and hygiene can prevent cholera, typhoid fever, and diarrhea. In 2030, SDG 6 aims for universal clean water and sanitation. Ensure clean drinking water, water resource management, and sustainable water technologies. To promote good hygiene and avoid illness, SDG 6 promotes hygiene education. SDG 15 targets desertification, land degradation, terrestrial ecosystems, and sustainable land use. Hence, DepEd (2022) entails that it has been recognized for successfully executing the Water, Sanitation, and Hygiene (WASH) in school policy within Southeast Asia, where it stands as one of the participating nations. The objective of the DepEd WinS Program is to enhance the educational and health conditions of Filipino students. This specific endeavor is school-centered, emphasizing water, sanitation, and hygiene, known as WASH practices, to fulfill the state's responsibility to protect children's rights and guarantee their optimal development.

This program is formulated to present a comprehensive and sustainable solution that can be readily implemented across various educational institutions. It has been noted that hygiene and sanitation challenges lead to anemia, stunted growth, and a higher incidence of absenteeism, which impedes the student's ability to learn and stay in school (DepEd, 2021). Moreover, at Pinagturilan National High School, among the recorded absences of students as evidenced in the "School Form 2 (SF2)" or the Records on Daily Attendance from September 2023 to February 2024, and a one-on-one interview with the advisers, approximately 40% of all school absences can be attributable to illnesses that are directly caused by inadequate water, sanitation, and hygiene conditions. This figure provides a perspective on students' health difficulties, which are directly or indirectly

influenced by their surroundings' WASH standards.

A focused investigation on the impact of WASH programs may be necessary in identifying the areas of knowledge or practices that require greater emphasis, considering the precise data on the sorts of WASH-related illnesses that affect students. Thus, this study aims to use lesson-integrated Water, Sanitation, and Hygiene (WASH) in Schools (WinS) to test whether it can raise students' health and environmental awareness. There is little research on incorporating water, sanitation, and hygiene into educational courses, especially classroom pedagogy. Since there is little scholarly research on this topic, thorough studies on the approaches, methodologies, and pragmatic applications that integrate water, sanitation, and hygiene initiatives into classroom instruction are needed, especially on how science teachers can bridge the current problem.

Statement of the Problem - This study explored the effect of WASH-Integrated Lessons on students' health consciousness and environmental awareness in school programs. Specifically, it sought to answer the following questions: (1) What is the level of acceptability of the researcher-made module? (2) What is the health consciousness score of the students in the control and experimental groups toward WASH as to pre-test and post-test? (3) What is the environmental awareness score of the students in the control and experimental groups toward WASH as to pre-test and post-test? (4) What is the performance of the students in the control and experimental groups in WASH? (5) Is there a significant difference in the health consciousness scores of the students in the control and experimental groups toward WASH? (6) Is there a significant difference in the environmental awareness scores of the students in the control and experimental groups toward WASH? (7) Is there a significant difference in the performance scores of the students in control and experimental groups toward WASH?

Significance of the Study - Water, sanitation, and hygiene in schools promote lifelong well-being by providing safe, potable water, improving clean, gender-sensitive, and inclusive sanitation infrastructures, and encouraging hygienic practices. Despite the compulsory program, students need to be made aware of the relevance of water, sanitation, and hygiene due to several issues, including a lack of integration in practical learning. Therefore, the immense knowledge of this study will benefit the following: with the majority of the study's result, students will be able to acknowledge and may be able to possess an inherent privilege to receive a standard of education that is of high quality, comprising unrestricted access to drinking water, sanitation, and hygiene (WASH) facilities. This study aims to offer teachers supplementary support in evaluating the health knowledge of their students while also providing enhanced integrative activities that effectively bridge the gap between their teaching and the necessity for students to comprehend water, sanitation, and hygiene (WASH) concepts. This study will help implement acceptable procedures to help parents identify the requirements for assessing their children's hygiene and their approach to doing so. This would allow parents to teach their children about water, sanitation, and hygiene practices. To school administrators, the result of this study will emphasize hygiene and sanitation practices, as well as the establishment of clean and safe school environments, which constitutes a key aspect of the educational establishment's focus on promoting the well-being of students.

The findings of this research will enable the Department of Education (DepEd), specifically the School Division of Occidental Mindoro, to identify the deficiencies in the execution of the program and subsequently enhance the educational and health outcomes of Filipino students. This will be accomplished by implementing a comprehensive, sustainable, and scalable school-based Water, Sanitation, and Hygiene (WASH) program, aligning with the state's obligation to safeguard the rights of children, ensure their dignity, receive assistance, and protect them from adversities that may impede their overall well-being. The study will offer valuable insights into the efficacy of the WinS program, hence informing budget allocation decisions made by Local Government units (LGUs). If the study determines the efficacy of the WinS program, local government units (LGUs) can contribute further resources toward implementing WinS programs within their respective areas. This study holds significant implications for non-governmental organizations (NGOs) involved in public health and social welfare initiatives. It will guide them in designing and implementing effective interventions to address WASH problems and secure funding in collaboration with local communities. This study will allow our Provincial Environment and Natural

Resources Office (PENRO) of Occidental Mindoro to create a sustainable program to develop environmental stewardship among students and other community members. The study's findings may allow future researchers to identify interventions that will be significant in providing enhanced concepts of Water, Sanitation, and Hygiene implementation in the Philippines. Moreover, this may become a leading bridge of comparison between the demographics of students and the acknowledgment of health consciousness and environmental awareness.

Scope and Delimitation of the Study - This study focused on the effect of WASH-Integrated Lessons on the students' health consciousness and environmental awareness. It specifically concentrated on an experimental study between control and experimental groups of students. A pre-test and post-test revolving around water, sanitation, and hygiene were provided, thus allowing a comparison between the groups. Only 80 grade 10 students enrolled at Pinagturilan National High School in the school year 2023-2024 were integrated into this study. Subsequently, a research questionnaire containing 50 items in two parts was used. The print module was also validated by experts and used to gather the data. The experimental study was conducted face to face, wherein a formal letter of request and consent form were first distributed before the actual run of the survey. The researcher spent four weeks discussing the WASH-integrated lessons and another week of gathering data. The study projected confidentiality and self-participation only. Any other factors that may contribute to water, sanitation, and hygiene that were not mentioned were not part of the study; therefore, they had to be excluded.

2. Methodology

Research Design - This study used a true experimental research design. Mainly, this encompassed methods that enabled the examination of a hypothesis and comprehensive investigation of cause-and-effect connections between factors using a scientific approach to integrate the WinS program. The goal was to evaluate hypotheses and establish causal inferences based on the correlation between variables. The experimental research design enabled the comparison of integrating WASH in an experimental group while allowing the control group to acquire the current teaching strategy continuously. This expanded significant data on the effects of every variable contributing to health consciousness and environmental awareness on water, sanitation, and hygiene implications.

Participants of the Study - Pinagturilan National High School is the second-largest secondary school in Sta. Cruz in terms of population. There were 1,204 students enrolled in the school year 2023-2024, and 17% of the population is in grade 10. Grade 10 students were considered part of the experimental study to facilitate the current teaching integration of the researcher's hands-on teaching. Implementing this study will recognize how far the grade 10 students achieve health consciousness and environmental awareness before ending their junior high school. This study would determine and nurture their sense of responsibility as adolescents, preparing them as they transition to senior High School. Whether they leave and transfer to another school or not, they will embody a healthy lifestyle and become stewards of the environment. The researcher handled four sections, two of which were part of the study. One section became the control group, and the other became the experimental group. Choosing the two sections no longer used a specific scheme since the class sectioning of the school is heterogeneous from the beginning of the school year, wherein students' average was sorted and distributed into four sections. Simple random sampling was employed to select the participants for the study. A total of 80 participants were determined, and 40 participants took part in the experiment, the same as the control group.

Research Instrument - The researcher established a researcher-made questionnaire through various related literature and journals, and the information needed in the study was integrated from the researcher-made module as specified in the specifications table. After that, the researcher facilitated a focal group discussion with colleagues to formulate and finalize the questions to be included in the questionnaire. The questionnaire, as the main instrument of the study, has been subjected to validation by the science teachers, master teachers, and WinS coordinators of the school using face and expert validity. The questionnaire was revised based on the suggestions given. Thus, this established proper validation of the study's appropriate construction and content representation. The first part of the questionnaire was composed of 25 items identifying the health consciousness of students, whereas the second part revolved around the 25 items on environmental awareness. To establish the

questionnaire's reliability, after the validation, the instrument underwent a pilot study in which 30 grade 10 students from the other section took the test. The pilot study was implemented to determine whether the questionnaire was understood by the respondents. This ensured reliability and allowed for minimizing errors during the actual run.

Table 1

Reliability Results of the Instruments

Components	Number of items	KR-20 Coefficient*	Interpretation
I. Health Consciousness	25	0.721	High Reliability
II. Environmental Awareness	25	0.811	High Reliability

*Cronbach's Alpha based on standardized items

The researcher-made instrument, which consists of two parts, health consciousness, and environmental awareness, underwent the test of consistency using the Kuder-Richardson Formula 20 (KR-20). With 25 items for each part, the test was administered to 30 student respondents. After all the items were checked, the scores were recorded with one (1) for a correct answer and a zero for an incorrect answer. The scores obtained were then summed up. Indicating a generally high reliability of the instrument with coefficients 0.721 and 0.811, the instrument can then be administered to the final set of students. After the pilot testing, the questionnaire underwent an ethics review application for approval of data collection.

Data Gathering Procedure - To effectively ascertain the objective of the goal, formal written requests were submitted to the target school for conducting the study, followed by direct transmission. Upon receiving approval, individual consent letters were personally distributed to the participants. Hence, the aforementioned consent form incorporated a researcher-made questionnaire. The participants were grouped into control and experimental groups; both groups took the pre-test accordingly. Before the administration of the pre-test, four modules were crafted based on the identified relevant topic of the third quarter on health and environment, namely: (1) The Role of Hormones in the Male and Female Reproductive System, integrated with proper hygiene in the male and female reproductive system and hygiene during menstruation; (2) The Nervous System, integrated with proper sanitation, handwashing, and safe drinking water to prevent bacterial and viral infections; (3) The Endocrine System, integrated with food safety and proper oral health; and (4) Biodiversity and Stability, integrated with waste management, which is also a component of WASH. Crafted modules were validated by science teachers, master teachers, and WASH coordinators and revised based on the suggestions. The modules were used by the researcher during the study with the experimental group. The incorporated WASH practices in lesson activities allowed students to practice group handwashing using soap and water and group tooth brushing. Participants were encouraged to think about WASH issues and how they could contribute to solving them. Students' learning was evaluated through quizzes, projects, and unit tests. After four weeks of integration, a post-test containing the same questions as the pre-test was administered. Meanwhile, the control group remained in the conventional implementation of WASH, led by the WASH coordinator. Their only exposure to WASH concepts is from posters on bulletin boards, bathrooms, and wash areas. The materials used in the control group are the modules prepared and distributed by the Department of Education; no hint of WASH was given during class discussion. After four weeks of discussion, a post-test was also administered, containing the same questions as the pre-test. A unit test was also administered to both groups.

Statistical Treatment of the Data - Frequency and percentage were used to describe the participants' scores from the pre-test and post-test. Mean and standard deviation were used to assess the average and dispersion of the scores, and the paired sample T-test was used to establish comparability between the groups' scores. Lastly, analysis of variance was used to determine the significant difference between the performance scores of the two groups. The computations were all set at the 0.05 significance level using the Statistical Package for the Social Sciences (SPSS) version 26.

Ethical Considerations - The researcher ensured that all information was only for research purposes and complied with the Data Privacy Act 2012 (Republic Act 10173). The researcher formally requested permission from the school's principal to initiate the study. All maneuvers and data-gathering approaches commenced after receiving written authorization from the respective departments. The author is in complete alignment with the provisions outlined in the Data Privacy Act of 2012, whereby any documents, information, and materials collected throughout this investigation will not be disclosed nor revealed and shall be used solely to interpret results in strict accordance with the stated objectives of this research paper. Should the respondents wish to withdraw or back out at any study phase, they are free to do so.

3. Results and discussions

Table 2

Mean Level of Acceptability of the Researcher-made Module

Factor	Mean	SD	Interpretation
Factor 1: Content	3.86	0.19	Very Satisfactory
Factor 2: Format	3.79	0.13	Very Satisfactory
Factor3: Presentation and organization	3.68	0.11	Very Satisfactory
Factor 4: Accuracy and Up-to-Dateness of Information	4.00	0.00	Very Satisfactory
WASH CONTENT	3.80	0.14	Very Satisfactory
Overall Validation	3.83	0.12	Very Satisfactory

Scale: 4.00-3.00- Very Satisfactory, 2.99-2.00- Satisfactory, 1.99-1.00 Poor, 1.00-0.99 Not Satisfactory

The validation tool for the print module has been adapted and modified from the DepEd LRMDS (2009), allowing the validators to choose from 1-4 of satisfactory. Five categories were emphasized, with four factors emphasizing Factor 1: Content, Factor 2: Format, Factor 3: Presentation and Organization, Factor 4: Accuracy and Up-to-Dateness of Information, and WASH Content. Table 2 shows the module's validation, with an overall validation grade of 3.83 (SD = 0.12), or very satisfactory. Among all the factors, factor 4 on accuracy and up-to-date information shows the highest mean of four, or very satisfactory. This is followed by factor 1, content, with a 3.86 mean or satisfactory. The lowest mean points for factor 3 were presentation and organization, which garnered a mean of 3.68. WASH content also shows a very satisfactory rating with a mean of 3.80. This result shows that the researcher-made module is qualified to be an instrument for realizing the aim of the study. As Inarda (2023) supported, print modules are valuable to students' learning as they help develop independent learning and effective knowledge acquisition. Print modules can lead to realizing the desired learning outcomes and increasing students' performance.

Table 3

Summary Distribution of Students' Pre-test Scores in Health Consciousness Toward WaSH

Pre-test Scores	CONTROL Weighted Mean = 12.35		EXPERIMENTAL Weighted Mean = 12.80	
	Frequency	Percent	Frequency	Percent
1 - 5	2	5.0	1	2.5
6 - 10	10	25.0	9	22.5
11 - 15	16	40.0	22	55.0
16 - 20	11	27.5	5	12.5
21 - 25	1	2.5	3	7.5
Total	40	100.0	40	100.0

Table 3 shows the health consciousness of students in control and experimental groups toward the

implication of WASH as to their pre-test scoring. The control group garnered a mean of 12.35, with a repeated score group of 11-15 with a frequency of 16 (40%), followed by 16-20 with a frequency of 11, or (27.5%). Meanwhile, the experimental group garnered a higher mean of 12.80, with a repeated score group of 11-15 with a frequency of 22 (55%). Hence, this is followed by 6-10 with a 9- or 22.5% frequency. With the given result, a high variance in a test-scoring dataset signifies a wide distribution of students' scores, indicating a vast range of knowledge toward health consciousness. Results indicated that there are health-conscious students, as shown in the 16-20 and 20-25 scoring groups. To properly explain the garnered result, students prioritize their health to enhance their general well-being and prevent disease. Students should prioritize personal hygiene, reproductive system health, handwashing, and sanitation to safeguard themselves and others from potential health hazards, which has resulted in a high score. This is viewed from the study of Soboksa et al. (2020), which states that following proper hygiene protocols are vital to prevent the transmission of microorganisms that can lead to disease. Hence, the students practice such activities.

Moreover, such positive activities are confirmed by an influential factor. Sun et al. (2019) explain that peer influence is a critical determinant that adds to awareness and interest in students' health. Peers and fellow students can significantly influence students' behavior and attitudes regarding health. When students are in the company of their classmates who prioritize health and hygiene, individuals are more inclined to embrace similar practices. Subsequently, in contrast to the aforementioned, there are still students with low health consciousness, as evidenced by the given result of scoring groups 1-5 with a frequency of 2 for control and 1 for experimental, which means that both groups have participants with insufficient knowledge of the implication of health consciousness. This affirms the statement of Ahmed et al. (2020) that the absence of understanding of the significance of cleanliness can lead to students' disregard for fundamental hygiene practices and expose themselves to the possibility of illness.

Table 4

Summary Distribution of Students' Post-test Scores in Health Consciousness Toward WaSH

Pre-test Scores	CONTROL Weighted Mean = 11.98		EXPERIMENTAL Weighted Mean = 15.98	
	Frequency	Percent	Frequency	Percent
1 - 5	0	0.0	0	0.0
6 - 10	16	40.0	5	12.5
11 - 15	16	40.0	13	32.5
16 - 20	8	20.0	17	42.5
21 - 25	0	0.0	5	12.5
Total	40	100.0	40	100.0

Table 4 shows the health consciousness of students in the control and experimental groups toward the WASH post-test. Garnering the highest mean of 15.98 from the experimental group shows improvement and a greater value of knowledge, with a repeated score of 17 (42.5%) from the score group of 16-20. This group garnered high scores, with a frequency of 5 from the score group of 21-25 (12.5%). Meanwhile, the control group garnered a mean of 11.98 with a relatively lower variance, which closely established a repeated value. This has been proven by the frequency of the score in groups 6-10 and 11-15, with repeated scoring of 16 or (40%). To properly explain, due to the integration of WASH, the students in the experimental group were exposed to issues including appropriate handwashing techniques, sanitation practices, and the significance of having access to clean water as part of their academic modules. They were instructed on the importance of these habits in preserving optimal health and eliminating illness. By integrating these subjects into their studies, these students were able to cultivate a greater understanding of the significance of embracing these principles in their everyday lives. Conversely, students in the control group were not exposed to WASH integration in their curriculum, which is why they got lower scores than the experimental group. As Lesesne et al. (2019) have said, health education helps students develop skills, values, and attitudes that enable them to understand and practice

healthy lifestyles.

Table 5

Summary Distribution of Students' Post-test Scores Environmental Awareness Toward WaSH

Pre-test Scores	CONTROL Weighted Mean = 10.05		EXPERIMENTAL Weighted Mean = 10.95	
	Frequency	Percent	Frequency	Percent
1 - 5	8	20.0	5	12.5
6 - 10	13	32.5	15	37.5
11 - 15	15	37.5	14	35.0
16 - 20	4	10.0	4	10.0
21 - 25	0	0.0	2	5.0
Total	40	100.0	40	100.0

The environmental awareness of students in control and experimental groups toward WASH as to pre-test is presented in Table 5. The control group garnered a mean of 10.05, a not-so-relatively low, with the experimental group's mean of 10.95, with a difference of 0.9. The control group shows repeated scores in a scoring group of 11-15 with a frequency of 15 (37.5%). The highest score for this group is 16-20, with a frequency of 4 (10%). Meanwhile, the experimental group showed repeated scores in a scoring group of 6-10 with a frequency of 15 or 37.5%. The highest scores fall from the score group of 21-25 with a frequency of 2 or 5%. The result explains that both control and experimental have a scoring pattern that is close to each other, pointing out that knowledge and environmental awareness are nearly the same for both groups. Subsequently, the result explains that with a near-perfect scoring, both groups have methodical and organized strategies for learning about the environment. Students are presented with a diverse array of environmental challenges. They are prompted to carefully assess the consequences of human actions on the surroundings, even before the incorporation of WASH and other influencing factors. Similarly, as explained by Žalėnienė (2021), this fosters the cultivation of conscientiousness and obligation regarding the environment. Through participation in environmental research projects and conservation activities, students will be equipped to tackle environmental concerns and make well-informed judgments regarding environmental issues in the future.

Table 6

Summary Distribution of Students' Post-test Scores in Environmental Awareness Toward WaSH

Pre-test Scores	CONTROL Weighted Mean = 12.15		EXPERIMENTAL Weighted Mean = 16.2	
	Frequency	Percent	Frequency	Percent
1 - 5	1	2.5	0	0.0
6 - 10	12	30.0	4	10.0
11 - 15	16	40.0	10	25.0
16 - 20	10	25.0	21	52.5
21 - 25	1	2.5	5	12.5
Total	40	100.0	40	100.0

Table 6 shows the environmental awareness of students in the control and experimental groups toward WASH as a result of the post-test. A total mean of 12.15 among the control group was garnered. A repeating score from the group of 11-15, with a frequency of 16 and a percentage of 40, was also recorded. The experimental group has a mean of 16.2, a higher grade than the control group. With a repeating score from the score group of 16-20 or 21 (52.5%). This explains that because of the governing integration of WASH, subsequent knowledge was influenced by making them think critically and expand their curiosity toward environmental awareness. Moreover, to properly explain the result, incorporating WASH practices into

environmental awareness modules enhanced the development of comprehension of environmental challenges. By highlighting the interconnectedness of water, sanitation, and hygiene with environmental health, students could understand the significance of sustainable practices that enhance the welfare of both humans and the environment. This holistic approach to environmental education had the potential to foster a more profound comprehension of the intricate interconnections among human actions, water resources, and the well-being of ecosystems, ultimately resulting in an enhanced academic performance. This supports the findings of Ali et al. (2019) that those students who know water conservation, waste management, and hygiene practices are more environmentally responsible. Acquiring this knowledge inspires students to actively support improving water and sanitation services in their communities, resulting in beneficial alterations in environmental policies and practices

Table 7

Unit Performance Scores of Students in WaSH

Scores	CONTROL Weighted Mean = 30.10		EXPERIMENTAL Weighted Mean = 31.25	
	Frequency	Percent	Frequency	Percent
16 - 20	5	12.5	2	5.0
21 - 25	8	20.0	9	22.5
26 - 30	10	25.0	9	22.5
31 - 35	7	17.5	6	15.0
36 - 40	5	12.5	9	22.5
41 - 45	4	10.0	5	12.5
46 - 50	1	2.5	2	5.0
TOTAL	40	100.0	40	100.0

Table 7 shows the unit performance scores of the students in the control and experimental groups in WASH. The control group garnered a mean of 30.10, while the experimental group garnered 31.26, with a difference of 1.15. The control group shows repeated scores in a scoring group of 26-30 with a frequency of 10 (25%). The highest score for this group is from the scoring group of 46-50, with a frequency of 1 or 2.5%. Meanwhile, the experimental group obtains a 2 or 5% frequency from the highest-scoring group of 46-50. The control group shows more frequency in the lowest scoring group of 16-20 compared with the experimental group of 5 and 2 or 12.5% and 5%, respectively. The result shows that both groups obtained average mean scores for the unit test. Different factors, like the school environment, and peer influences, may have contributed to this result. A conducive learning environment in which the learners feel free and safe gives them peace of mind, leading to the positive acquisition of knowledge and arousing interest in the learners to work enthusiastically (Kipkemboi & Korir, 2014).

Table 8

Paired Samples T-Test on Health Consciousness Scores in the Pre-test and Post-test

Health Consciousness	CONTROL		EXPERIMENTAL	
	PRE-TEST	POST-TEST	PRE-TEST	POST-TEST
Mean	12.35	11.98	12.80	15.98
Standard Deviation	4.470	3.745	4.496	4.382
Mean Difference	0.37		-3.18	
T-VALUE	0.407		-3.020	
P-VALUE (SIG.) *	.686		.004	
Interpretation	Not Significant		Significant	

*Significant at $p<0.05$

The comparison between the pre-test and post-test scores on the health consciousness score was tested using the paired samples t-test anchored at the 0.05 significance level. Students from the control group yielded a pre-test mean score of 12.35 and a slightly lower post-test score of 11.98, which resulted in a difference of 0.37. The t-value of 0.407 is small and gives a p-value of 0.686, which exceeds the 0.05 level. It can be derived that their scores before and after are closely comparable. Meanwhile, the computed means of the experimental group are higher than the control group both in pre-test and post-test. These recorded 12.80 and 15.98, respectively. The mean difference is -3.18 since the pre-test scores are lower than the post-test scores. The t-value yielded -3.020, which is significant at the 0.004 level. The t-value, in general, should be greater than +2 and less than -2 to be considered significant. Thus, the result suggests a remarkable improvement in scores in the experimental group. The deviation of the scores from the pre-test to the post-test appears to be high in both groups, with standard deviation values ranging from 3.745 to 4.496. On another note, the result was not significant for the control group. This suggests that the conventional implementation of WASH given to the control group did not affect their health consciousness. This is in line with the statement of Gikuhi et al. (2021) that the effects of school-based water, sanitation, and hygiene (WASH) programs have inconsistent results concerning the student's health and educational outcomes.

Table 9

Paired Samples T-Test on Environmental Awareness in the Pre-test and Post-test

Health Consciousness	CONTROL		EXPERIMENTAL	
	PRE-TEST	POST-TEST	PRE-TEST	POST-TEST
Mean	10.05	12.15	10.95	16.20
Standard Deviation	4.557	4.197	4.744	3.897
Mean Difference	-2.10		-5.25	
T-VALUE	-2.198		-6.599	
P-VALUE (SIG.) *	0.034		0.000	
Interpretation	Significant		Highly Significant	

*Significant at $p<0.05$

Regarding environmental awareness, the students from the control group registered mean scores in the pre-test (10.05) and post-test (12.15) with a difference of -2.10. This indicates an increase in the group's score from the pre-test to the post-test. With the computed t-value of -2.198, the difference is considered significant at the 0.034 level. As for the experimental group, the students obtained a 10.95 mean on the pre-test and a 16.20 mean on the post-test, resulting in a difference of -5.25. The large t-value of -6.599 is highly significant at the 0.000 level. Variation in the scores for all tests is evident, as reflected by the standard deviation values from 3.897 to 4.744. Overall, both groups showed significant improvement in environmental awareness in the pre-test and post-test scores.

However, the experimental group may have acquired the targeted knowledge because of the interventions about environmental awareness and WASH behaviors. The exposure likely enhanced their awareness and understanding of the topic, resulting in higher ratings than the control group who did not receive the treatment. It is plausible that individuals in the experimental group possessed a greater degree of pre-existing knowledge and enthusiasm for environmental issues or WASH practices than those in the control group. Jimenez (2021) states that WinS programs facilitate the cultivation of a more profound comprehension of environmental concerns and the significance of sustainable methodologies among students. Through acquiring knowledge about the consequences of their actions on the environment, students develop a heightened sense of responsibility and attentiveness toward their behavior and consumption habits. WinS programs focus on improving children's environmental awareness and skills, as Rivera (2020) stated, and contribute to their overall personal development. Participating in environmental sustainability projects helps cultivate empathy, teamwork, and leadership.

Table 10

Analysis of Variance on the Students' Performance Scores Between Control and Experimental Groups Toward WASH

	Sum of Squares	df	Mean Square	F	Sig.*	Interpretation
Between Groups	167.318	6	27.886	14.016	.000	Highly Significant
Within Groups	65.657	33	1.990			
Total	232.975	39				

Legend: *Significant at p-value<.05

In examining the difference between the performance scores of the control and experimental groups toward WASH, the Analysis of Variance (ANOVA) is used and set at the 0.05 significance level. Seven scores from 16-20 to 46-50 were classified based on the raw scores obtained. The computation yielded a large F-value of 14.016 at the 0.000 significance level. This leads to the rejection of the null hypothesis. Thus, the unit test administered to the two student groups is highly significant. This result supports the cross-sectional survey of Ahiatrogah (2020), where 98% of participating students affirmed that WASH made it easier for them to participate in class activities, and roughly 28% said that they perform better in exams. A recent study also found that improved handwashing practices in schools significantly reduced absenteeism due to diarrhea and respiratory infections (Sangalang et al., 2022). This translates to more time spent in class and learning for students. Still, we must work hard to eliminate other factors affecting students' performance. Individual factors include gender and peers, household-related factors such as parents' education and household income, teacher-related factors, and school-related factors (Asif, 2020). While the direct link between WASH and academic performance requires further investigation, evidence suggests that good hygiene practices can contribute to positive student outcomes. Promoting consistent hygiene practices and addressing underlying inequalities can create a healthier and more conducive learning environment for all.

4. Conclusions

Applying the RANAS Model of Behavioral Change has significantly shown results in behavior change strategies, which have been proven to provide evidence based on further interventions (Mosler, 2012). Thus, based on the study's findings, the following conclusions were drawn: the acceptability of the researcher-made module is very satisfactory. In health consciousness, the experimental group performed better than the control group during the pre-test and post-test. The experimental group performed better in environmental awareness than the control group during the pre-test and post-test. The experimental group performed better than the control group in the unit test. There is a significant difference in the health consciousness scores of students in the control and experimental groups toward WASH. There is a significant difference in the environmental awareness scores of students in the control and experimental groups toward WASH. There is a high significant difference in the performance scores of the students in the control and experimental groups toward WASH.

4.1 Recommendations

Based on the findings, the researchers recommended the following: Teachers may enhance the knowledge or data set to incorporate WaSH into health consciousness to establish the greater value of the effect. This is by providing realistic and enhanced skill sets or activities integrated into the module. Teachers and School heads may implement WaSH in every module. It may be sustainable and achievable, and the school head must implement it and eventually be trained by their teachers and personnel. The DepEd may conduct a campaign or advocacy that will support the WinS and allow the integration of students' decisions or ideas into what effective activities can be incorporated. The DepEd may prioritize partnerships with LGUs or medical officers to implement and discuss WinS properly, allowing for the improved construction of WaSH activities. School heads

and teachers may enhance WASH facilities such as bathrooms, washing and tooth brushing areas, and garbage areas to offer a great venue for applying knowledge learned on WASH. With better facilities, students will be able to maintain optimum levels of hygiene and sanitation, thus reducing the number of hygiene-related illnesses and absenteeism. Future researchers may survey the awareness and knowledge of students in WASH so they may integrate their perspectives and aspects of understanding toward it. Future researchers may include the demographic profile of the participants to determine if a relationship exists between health consciousness and environmental awareness.

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