ISSN (Online): 2455-3662
EPRA International Journal of Multidisciplinary Research (IJMR) - Peer Reviewed Journal
Volume: 12| Issue: 6| June 2026|| Journal DOI: 10.36713/epra2013 || SJIF Impact Factor 2026: 8.753 || ISI Value: 1.188

EFFECTIVENESS OF STUDENT-DESIGNED INFOGRAPHIC MATERIALS IN RAISING DISASTER AWARENESS

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ABSTRACT

This study investigates the effectiveness of student-designed infographic materials in enhancing disaster awareness among Grade 7 students at Holy Cross Academy, Tubigon, Bohol, during the academic year 2024-2025. A quasiexperimental design was employed, involving 50 students in the control group, exposed to text-only materials, and 50 students in the experimental group, provided with infographic-based materials. The research examined awareness levels regarding earthquakes, typhoons, and floods using pre-tests and post-tests. Findings revealed that the experimental group demonstrated significantly greater improvements in disaster awareness compared to the control group. Hence, the study concluded that the student-designed infographic materials are effective in raising disaster awareness. The findings highlight the value of infographic materials as engaging and effective educational tools that enhance comprehension and retention. The study concludes that integrating studentdesigned infographics into disaster education programs fosters better preparedness and awareness among learners. Recommendations include broader implementation of infographic-based learning in schools and further research to explore its applicability in other contexts. This study contributes insights into the educational application of infographics in disaster preparedness.

CHAPTER I
THE PROBLEM AND ITS SCOPE
INTRODUCTION
Rationale

An infographic is a collection of imagery, data visualizations like pie charts and bar graphs, and minimal text that gives an easy-to-understand overview of a topic (Nediger, M. 2023). It is a powerful way to visually communicate data, ideas, and knowledge (Sheikh, M. 2024). Research indicates that infographics are significantly more engaging, with a 30 times higher likelihood of being read than text-only articles (Ennis-O'Connor, M. 2022). The visually appealing nature of infographics is its powerful characteristic because it makes it easier for people to comprehend and remember what is being presented. It also enhances retention, as stated by Soyibo, 2023. By presenting information clearly and visually engaging, infographics become a valuable means for communicating complex facts, definitions, and technical details quickly and effectively, especially during emergencies (Yavar et al., 2012).

Talking about emergencies, the province of Bohol was greatly affected by a massive 7.2 magnitude earthquake, causing 195 deaths, according to data from the World Health Organization. The province was also significantly impacted by Typhoon Odette (internationally known as Typhoon Rai) on December 16, 2021, especially in the towns and coastal communities in the northern part of Bohol, such as Tubigon. The number of affected children was significant, highlighting the vulnerability of these populations during such natural disasters.

Considering the danger the province faces from natural disasters, a recent study conducted by Daray et al. (2023), students of Holy Name University, aimed to identify the level of Disaster Risk Reduction (DRR) awareness and knowledge among Upper Primary and Junior High School learners in Inabanga, Bohol. This study served as the basis for developing DRR infographic materials. Current researchers are using their research products to test the effectiveness of these student-designed infographics as instructional materials.

Educating students on disaster risks in schools plays a pivotal role in building resilient communities, as students can transfer their knowledge to their families, thereby enhancing public awareness and preparedness. Additionally, instilling disaster risk awareness among students ensures their safety and contributes to the overall resilience of communities in the face of disasters. Using infographic materials to educate students is an excellent method for delivering information through visually appealing products that arouse students' interest. Hence, the researchers aim to determine the effectiveness of the student-designed disaster risk infographic materials of Daray et al. (2023) in raising awareness to Grade 7 students about the various disasters, specifically earthquakes, floods, and typhoons.

Background of the Study

This research is grounded in the Cognitive Theory of Multimedia Learning (Mayer, R. E. 2005), which suggests that people learn best when information is delivered through visual and auditory channels. This theory encompasses two principles: the multimedia principle and the limited capacity principle. The multimedia principle asserts that combining words with graphics leads to better learning than using words alone. Leveraging both visual and auditory elements enhances understanding and memory retention. The limited capacity principle emphasizes that humans have finite cognitive resources, so they try to comprehend information by forming mental representations from various sources. Therefore, effectively presenting information to manage cognitive load effectively is essential for successful learning.

The result of the study by Alwadei (2023) shows that students improve their vocabulary with the aid of infographics. Infographics, being a visual medium, have the potential to align with the multimedia principle by combining text and graphics. Through visually appealing presentations, infographics can help alleviate cognitive strain and facilitate the creation of mental representations, thus aiding comprehension. Furthermore, infographics can effectively engage learners in the learning process by employing design strategies that promote active processing, such as clear information organization and integration. Therefore, integrating insights from the Cognitive Theory of Multimedia Learning can guide the design and evaluation of infographics to enhance learning outcomes. It's clear that by combining text and images, infographics, a visual medium, have the ability to

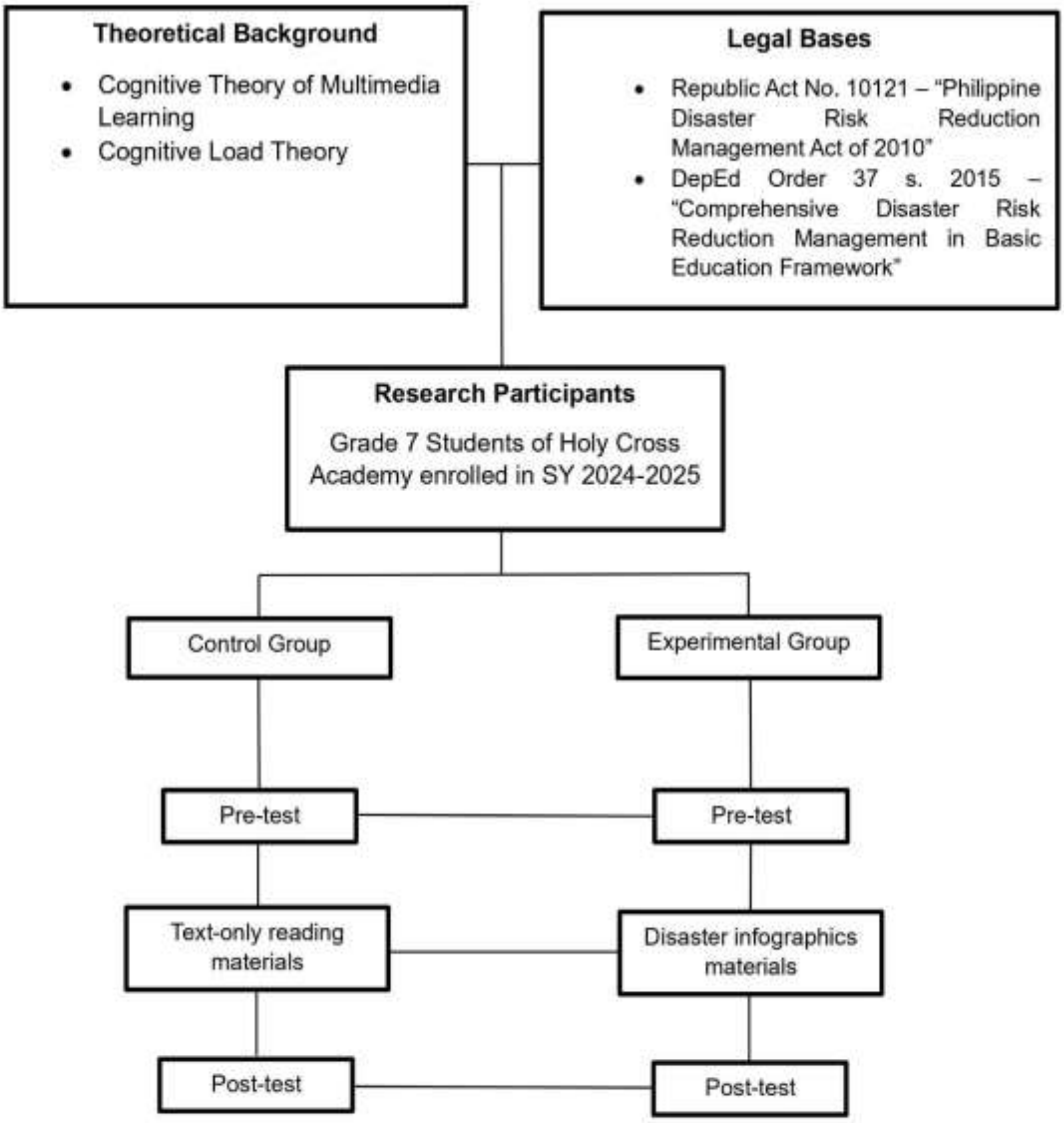

Figure 1. Schematic Diagram of the Study adhere to the multimedia principle. Infographics can improve comprehension by reducing cognitive load.

Another theory anchored to this study is the Cognitive Load Theory (CLT), proposed by Merrienboer and Sweller (2005). This theory suggests that learning is more effective when presented in a manner that reduces cognitive load. Infographics serve as a means to diminish cognitive load by conveying information concisely and in visually engaging formats, facilitating easier processing and retention of information and consequently enhancing learning efficiency. When the mental load exceeds manageable levels, it can impede learning outcomes. This occurs because individuals need help to effectively process the presented information, potentially resulting in overlooking crucial details or committing errors.

In the context of infographics, cognitive load theory provides an essential framework for understanding how cognitive load influences learning and comprehension and insights into optimizing the design of visual materials like infographics.

The Philippine government made a move to lessen the effects of disasters President Gloria Macapagal Arroyo signed the Republic Act. 10121, on March 27, 2010, also known as the "Philippine Disaster Risk Reduction and Management Act of 2010, which mandates that the National Disaster Risk Reduction Management Council (NDRRMC) craft a framework that will serve as the basis for conducting DRRM throughout the Philippines (Saño EA, 2010).

Moreover, Section 14 of the R.A. No. 10121 Integrating Disaster Risk Reduction Education into School Curricula, Sangguniang Kabataan (S.K.) and Mandatory Training for Public Sector Employees. DepEd, CHED, and the Technical Education Skills and Development Authority (TESDA) should incorporate DRR Education into the curricula of basic and tertiary education programs, whether private or public institutions. This includes formal and nonformal educational programs, technical-vocational programs, indigenous learning, and after-school youth courses and initiatives. The goal is to make students more resilient to natural disasters.

As a result, the Department of Education (DepEd) has issued a Comprehensive Disaster Risk Reduction and Management (DRRM) in the Basic Education Framework, aligning with Republic Act No. 10121's mandate to enhance resilience to natural disasters through education. This framework aims to institutionalize DRRM structures, systems, protocols, and practices within DepEd offices and schools, providing a shared understanding and language for DRRM implementation across all levels of basic education. The framework ensures uninterrupted learning while prioritizing quality education even during disasters and emergencies and fostering a culture of preparedness and resilience among students, teachers, and staff. About DepEd Orders and other related issuances, the framework supersedes inconsistent guidelines, repealing, rescinding, or modifying existing orders to ensure coherence and alignment with the new DRRM framework, showcasing DepEd's commitment to harmonizing policies to effectively address disaster risks and promote resilience within the education sector.

In today's digital era, schools have many ways to address disaster risk and raise awareness among their students using technologies, and one of the best examples is infographics. According to L. Suhardjono et al. (2021), infographics are one of the best mediums to communicate and share information. Infographics serve as visually engaging tools that present educational content in a graphic format. They are utilized to simplify complex information, share scientific findings effectively, and influence behavioral patterns through visual communication strategies. Their dynamic nature makes them valuable assets in various fields, enhancing understanding and engagement with diverse audiences (Traboco, 2022). Aside from being visually attractive, infographics emphasize the importance of delivering information clearly and concisely to become more understandable and compelling.

Considering these general qualities and purpose, infographics are one of the tools that will help deliver information like raising awareness and how to be ready when disasters occur clearly and concisely, especially for those living in areas that are exposed to natural disasters and lack sufficient information to protect themselves when a disaster threatens. (Bostrom et al., 2021). Aya Saleh et al., 2019 state that infographics are particularly effective for raising awareness and disseminating information. They succeed because they visually represent data in a way that is concise and easy to understand. This visual approach captures the viewer's attention and helps retain the information for a more extended period, especially in awareness campaigns where the artistic presentation simplifies and summarizes the message effectively.

One of the vital awareness campaigns that needs to be prioritized is disaster. Each year, it has been reported that the number of disasters occurring worldwide is significantly rising. One of the primary reasons why millions of people are seriously affected by those disasters is because of a lack of knowledge management. (Rina Suryani Oktar et al., 2020). Disasters can cause extensive damage to properties and communities, making it crucial to have the necessary knowledge and skills to provide both physical and psychological care effectively during such events (Nizar B. Said et al., 2020).

Infographics are instrumental in disaster management education and training by effectively conveying intricate information. It indicates that they can improve academic comprehension of natural disasters and boost community readiness and response capabilities. These graphics simplify data into visually clear layouts that align with the brain's visual processing, aiding swift understanding and retention. Integrating infographics into disaster management training ensures essential information is encoded for rapid retrieval and application during disaster response, enhancing decision-making abilities. Infographics can cover various disaster-related topics, from preparing for natural disasters such as hurricanes, earthquakes, and tornadoes to guiding emergency kits and safety measures (Alam et al., 2019; Shen et al., 2021).

Schools serve as primary hubs for learning and are essential in disaster risk management, playing a crucial role in preparing for, responding to, and recovering from disasters (Opabola, 2024). Disaster risk reduction can be enhanced through educational initiatives. One effective method involves educating students on disaster awareness and mitigation strategies. Introducing the concept of disasters at a young age can significantly impact efforts to reduce disaster risks by imparting essential knowledge about various types of disasters. This involvement helps minimize the impact of disasters on children by ensuring they are well-prepared and informed, enabling them to safeguard themselves from potential dangers and risks posed by disasters (Proulx & Aboud, 2019).

That is why engaging students in Disaster Risk Reduction (DRR) initiatives is important because it does not only equip them with valuable skills and knowledge but also cultivates a sense of responsibility and leadership (Reuter & Zschau, 2016). By actively involving students in DRR-related activities, they are empowered to take ownership of their roles as proactive contributors to building resilient communities. This hands-on experience not only enhances their understanding of disaster preparedness but also fosters a culture of collaboration, innovation, and positive impact within their localities.

Hence, it is ideal for teachers to utilize visual aids to make the process easier and help students retain information for a more extended period (VariQuest Blog, 2021). Visuals encourage active participation and more profound engagement during classroom discussions. They align perfectly with the preferences and learning styles of today's Millennial and Gen Z students, who are accustomed to visual entertainment and tend to have shorter attention spans. By integrating visuals into teaching, educators can captivate students' interest more effectively, making learning experiences more prosperous and

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meaningful. (Ebru Ulusoy, 2019). Infographics increase engagement, improve retention of information, enhance understanding of complex concepts, and improve communication skills. (Wahyoedi et al., 2022).

In disaster scenes and emergency situations, infographics hold the responsibility of efficiently and effectively conveying critical data and information to recipients within a short period of time. Given the high-stress nature of such events, the foremost priority is to ensure that the information is easily understood and retained by the intended audience. Therefore, the infographic should prioritize clarity, simplicity, and relevance. By presenting essential information in a format that is easy to grasp and remember, even under pressure, infographics can facilitate quicker understanding and enable recipients to make informed decisions amidst chaotic circumstances (Yavar et. al 2012).

This research study integrates principles from the Cognitive Theory of Multimedia Learning (Mayer, 2005) and the Cognitive Load Theory (CLT). Mayer's theory underscores the advantage of presenting information through visual and auditory channels, emphasizing that combining words with graphics enhances learning and memory retention. This supports our use of student-created infographics, which leverage visuals to convey information effectively, potentially improving disaster awareness compared to text-only approaches. Additionally, CLT suggests that reducing cognitive load by presenting information in a manageable format enhances learning outcomes. Aligning with these theoretical underpinnings, the concepts of the Cognitive Theory of Multimedia Learning and Cognitive Load Theory are used in this study, and it helps in answering the gap in the validation of the Disaster Risk Reduction infographic materials crafted by Daray et al., 2023. Hence, the researchers want to determine if these infographic materials effectively raise student awareness.

Statement of the Problem

This study aims to determine the effectiveness of the student-designed infographic material in raising awareness on the various disasters such as earthquake, typhoon, flood of the Grade 7 students of Holy Cross Academy of Pooc Oriental, Tubigon, Bohol for the school year 2024-2025.

Specifically, this sought to answer the following questions:

1. What is the level of awareness of the control and experimental groups about earthquakes, typhoons, and floods in the pre-test?
2. What is the level of awareness of the control and experimental groups about earthquakes, typhoons, and floods in the post-test?
3. Is there a significant difference between the result of the test scores in the:
   - 3.1 pre-test of the control and experimental group?
   - 3.2 post-test of the control and experimental group?
   - 3.3 pre-test and post-test of the control group?
   - 3.4 pre-test and post-test of the experimental group?

Statement of Hypotheses

The study will test the following null hypotheses:

1. There is no significant difference between the result of the pre-test and post-test of the control and experimental group.
2. There is no significant difference between the result of the post-test of the control and experimental group.
3. There is no significant difference between the pre-test and post-test of the control group.
4. There is no significant difference between the pre-test and post-test of the experimental group.

RESEARCH METHODOLOGY

Research Design

This quantitative research study utilized a quasi-experimental design to evaluate the effectiveness of student-designed Disaster Risk Reduction (DRR) infographic materials in fostering awareness and knowledge among students regarding natural disasters such as floods, typhoons, and earthquakes. In this design, researchers used a purposive sampling approach where the principal of the school chooses the two (2) comparable sections to be the respondents of the study. The study compared the pre-test and post-test outcomes for the experimental and control group. The experimental group was given infographic materials, while the control group was given textual materials. The study used pretest and post-test performance scores to determine whether there is a significant difference between the control and experimental groups. The result of the pre-test and post-test was analyzed using the paired T-test.

Research Environment

This study was conducted at Holy Cross Academy (HCA) at Pooc Oriental, Tubigon, Bohol. The researchers chose this school in the town of Tubigon as the research environment, for it is prone to disasters because of its location. Tubigon is located in Northern Bohol, where the North Bohol Fault lies. The town was extensively damaged during the destructive earthquake last October 15, 2013. Holy Cross Academy was also greatly destroyed when the quake hit the province. Furthermore, HCA is also located less than 500 meters from the sea making it prone to floods when typhoons hit. Moreover, last December 16, 2021, Typhoon Odette brought extreme rainfall and strong winds causing the level of water of the surrounding seas to increase resulting in heavy flooding.

Research Participants

The participants were Grade 7 students of Holy Cross Academy enrolled during SY 2024–2025. Using purposive sampling, two comparable sections were selected: one as the experimental group and the other as the control group. The groups had similar class sizes and academic performance. Students with prior exposure to infographic-based disaster awareness programs or with learning disabilities that could affect participation were excluded.

Research Instrument

The study utilized a researcher-made, validated multiple-choice questionnaire in English and Cebuano to assess disaster awareness on earthquakes, typhoons, and floods. It was validated by the Science Coordinator of Holy Name University and pilot-tested among Grade 7 students not included in the study. The instrument demonstrated excellent reliability (Cronbach's Alpha = 0.95).

Research Procedure

The researchers first secured the necessary approvals from the BACS Superintendent, the school principal, and the Grade 7 Science teacher of Holy Cross Academy. Ethical clearance was also obtained from the Dean of the College of Education and the Ethics Review Board (ERB) to ensure that the study complied with established ethical standards. Prior to the actual implementation, the researcher-made questionnaire underwent expert validation and pilot testing with Grade 7 students who were not part of the study. The instrument demonstrated excellent reliability, with a Cronbach's Alpha of 0.95.

Before data collection, informed consent was obtained from the parents, while student participants provided their assent after being informed of their rights, including voluntary participation, confidentiality, and the option to withdraw at any time. Two comparable Grade 7 sections were selected using purposive sampling, with one assigned as the experimental group and the other as the control group.

Both groups first completed a pre-test to determine their baseline level of disaster awareness. The experimental group was then exposed to student-designed infographic materials, while the control group received text-only reading materials containing the same content. The lessons covered earthquakes, typhoons, and floods, with each topic presented in a separate session. After each lesson, both groups completed a post-test to measure changes in their knowledge and awareness.

Finally, the researchers compiled, organized, and analyzed the data using appropriate statistical techniques to compare the performance of the two groups. The findings served as the basis for the study's conclusions and recommendations regarding the effectiveness of infographic-based instructional materials in enhancing disaster awareness among Grade 7 students.

Statistical Treatment of Data

To analyze the effectiveness of student-designed infographic materials in raising disaster awareness, the researchers utilized the paired T-test. By comparing the pretest and posttest scores of the control and experimental groups, this statistical method helped the researchers to determine if there are significant differences in disaster awareness attributable to the use of infographic materials.

The scale for Level of Awareness was adopted from Thakrar et al., (2014) for the interpretation of the results of this study.

Percentage Score (%)	Level of Awareness
70-100	Highly aware
40-69	Moderately aware
0-39	Lowly aware

Table 1. Level of Awareness based on percentage of score

Declaration of AI Use in Research Methodology and Manuscript Writing

This research employs artificial intelligence (AI) methodologies, including AI-assisted manuscript writing. The AI tools used, such as ChatGPT, PerplexityAI, to review the written content for grammar, coherence, and flow, helping to ensure that the research content is well-structured and polished. Additionally, Grammarly is also used for the purpose of paraphrasing the textual content and conducting grammar checks. This was done to guarantee that the research adheres to ethical standards and does not infringe upon any regulations against plagiarism.

Jesamie S. Albit, Joan Isabella T. Boligao, Arvic Manuel R. Cantoneros, Mariel Hubay, Margie Leornas, and Emerson Dave B. Makinano, the researchers, affirm full responsibility for the ethical use of AI throughout the study. In manuscript writing, considerations include transparent authorship attribution, disclosure of AI tools to peer reviewers, ensuring clarity and coherence, and safeguarding data security. Integrating AI-generated and human-authored content is approached with diligence, emphasizing review, quality assurance, and commitment to openness and reproducibility.

This declaration, dated March 25, 2024, underscores the commitment to ethical and responsible AI use in research methodology and manuscript creation.

DEFINITION OF TERMS

The following terminologies were specified to help facilitate a clear and mutual understanding of the essential concepts in our research, the following terms are defined.

Control Group. The control group was one of the identified groups in the research design to which the participants are assigned to. The control group was subjected to use a text-only reading material or notes as a learning aid before answering the post-test.

Effectiveness. This refers to the usefulness of student-designed infographic material in raising disaster awareness and how well the student designed infographic succeeds in informing people about disasters and encouraging them to be more aware and prepared for potential emergencies. This was measured by the difference of the result of the pre-test and post-test that were given to the student participants**.**

Experimental Group. The experimental group is the other group where participants were placed. This group utilized and was given the infographics as their learning aid prior to answering the post-test.

Pre-test. This refers to a measurement which identified the knowledge of student participants about the various disasters specifically earthquake, typhoon, and flood before giving the materials such as purely text material and the disaster infographic materials.

Post-test. This refers to a measurement of what the students had learned about the various disasters specifically earthquake, typhoon, and flood and was the basis in determining if the test results had improved after introducing the materials.

Student-designed infographic material. This pertains to the infographic materials about natural disasters including earthquakes, floods, and typhoons created by Daray et. al, 2023, with the help of teachers and other specialists.

CHAPTER II
PRESENTATION, ANALYSIS, AND INTERPRETATION OF DATA

This chapter presents, analyzes, and interprets the data gathered during the conduct of the pretest and post-test among the Grade 7 students of Holy Cross Academy. The results, analysis, and interpretation of the data were also presented

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through graphs and tables with their corresponding descriptions.

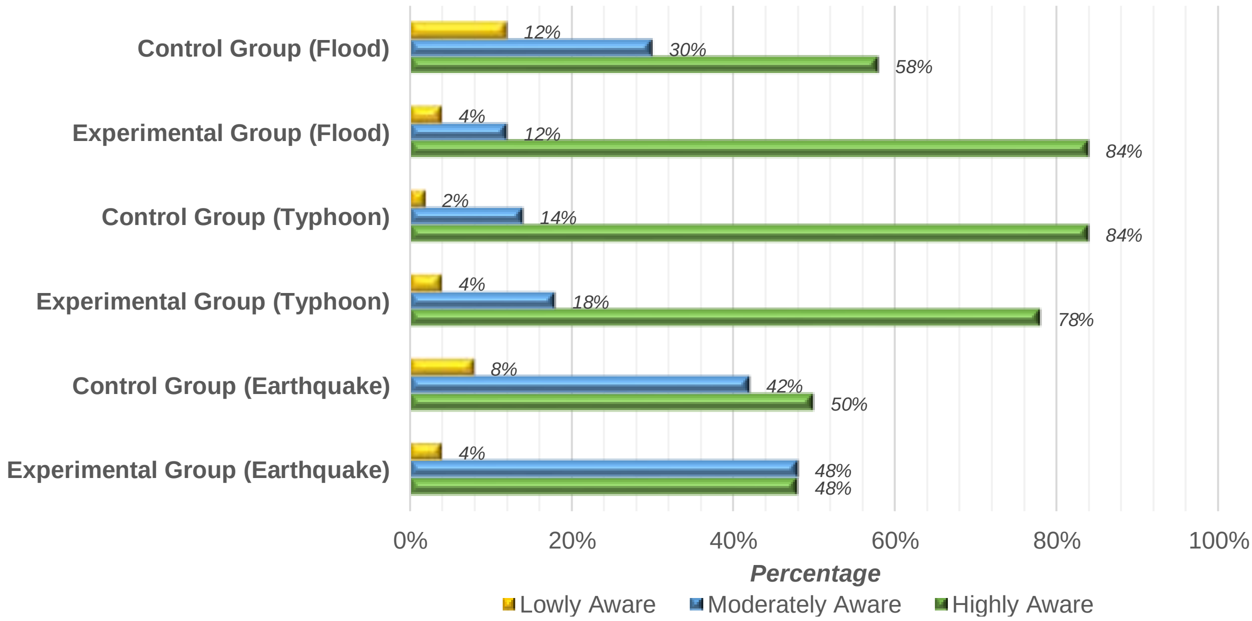

Figure 2. Students' Level of Awareness Across All Disaster Types as Revealed in the Pre-test

Figure 2 presents the pre-test awareness levels of the control and experimental groups across the three disaster types. For earthquakes, 50% of the control group and 48% of the experimental group were Highly Aware, 42% and 48% were Moderately Aware, while 8% and 4% were Lowly Aware, respectively. For typhoons, 84% of the control group and 78% of the experimental group were Highly Aware, 14% and 18% were Moderately Aware, while 2% and 4% were Lowly Aware, respectively. For floods, 58% of the control group and 84% of the experimental group were Highly Aware, 30% and 12% were Moderately Aware, while 12% and 4% were Lowly Aware, respectively.

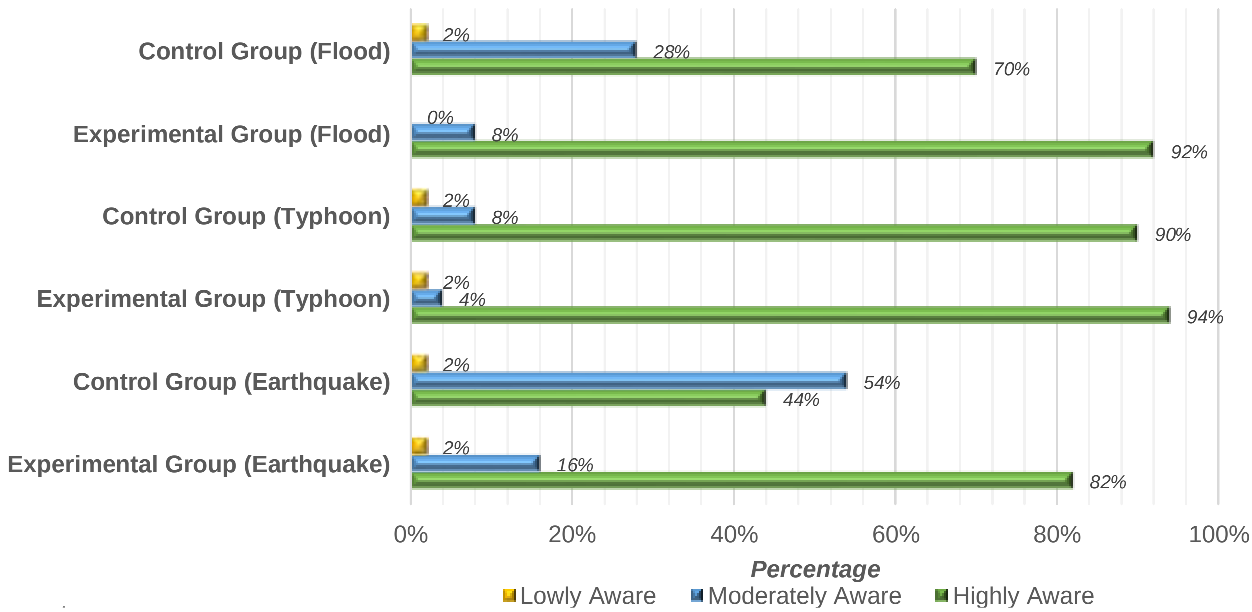

Figure 3. Students' Level of Awareness Across All Disaster Types as Revealed in the Post-test

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Figure 3 presents the post-test awareness levels of the control and experimental groups across the three disaster types. For earthquakes**,** 44% of the control group and 82% of the experimental group were Highly Aware, while 54% and 16%, respectively, were Moderately Aware, with 2% in both groups classified as Lowly Aware. For typhoons**,** 90% of the control group and 94% of the experimental group were Highly Aware**,** 8% and 4% were Moderately Aware, and 2% in both groups were Lowly Aware. For floods**,** 70% of the control group and 92% of the experimental group were Highly Aware**,** 28% and 8% were Moderately Awar**e**, while 2% of the control group and 0% of the experimental group were Lowly Aware.

Overall, the experimental group consistently achieved higher levels of awareness than the control group, particularly in earthquakes and floods, indicating the effectiveness of infographic-based instructional materials.

Table 2

Difference Between the Pre-test Results in the Level of Awareness of the Two Groups Across All Disaster Types

Disaster	**Control**		**Experimental**		**Mean Difference**	***t(df)***	***p***
	Mean	**SD**	**Mean**	**SD**		**At 0.05 level of Significance**	
Earthquake	6.36	1.37	6.56	1.55	0.20	-0.67(49)	0.505
Typhoon	8.16	1.92	7.60	1.66	0.56	1.87(49)	0.067
Flood	6.62	2.03	7.66	1.63	1.04	-2.81(49)	0.007

Table 2 presents the difference between the pre-test results in the level of awareness of the control and experimental groups across three disaster types: earthquake, typhoon, and flood. For earthquakes, the control group had a mean score of 6.36 with a standard deviation of 1.37, while the experimental group had a mean score of 6.56 with a standard deviation of 1.55. The mean difference between the two groups is 0.20, with a t-value of -0.67 and a p-value of 0.505. This indicates that the difference is not significant, thus, the null hypothesis is retained.

For typhoons, the control group had a mean score of 8.16 with a standard deviation of 1.92, while the experimental group had a mean score of 7.60 with a standard deviation of 1.66. The mean difference is 0.56, with a t-value of 1.87 and a p-value of 0.067. The difference is still not significant, and the null hypothesis is retained.

Lastly, for floods, the control group had a mean score of 6.62 with a standard deviation of 2.03, while the experimental group had a higher mean score of 7.66 with a standard deviation of 1.63. The mean difference is 1.04, with a tvalue of -2.81 and a p-value of 0.007. This shows a significant difference between the two groups, and the null hypothesis is rejected.

The results indicate that there was no significant difference in the pre-test awareness levels between the control and experimental groups for earthquakes and typhoons. However, for floods, the experimental group had significantly higher awareness levels compared to the control group.

Table 3.

Difference Between the Post-test Results in the Level of Awareness of the TwoGroups Across All Disaster Types

Disaster	**Control**		**Experimental**		**Mean Difference**	***t(df)***	***p***
	Mean	**SD**	**Mean**	**SD**		**At 0.05 level of Significance**	
Earthquake	6.34	1.39	7.66	1.53	1.32	-4.83(49)	<0.001
Typhoon	8.42	1.90	8.44	1.40	0.02	-0.06(49)	0.956
Flood	7.62	1.92	8.70	1.46	1.08	-3.38(49)	0.0014

Table 3 shows the difference between the post-test results of the control and experimental groups in the level of awareness across all disaster types. For earthquakes, the experimental group achieved a higher mean score (7.66) compared to the control group (6.34), with a mean difference of 1.32. This difference is statistically significant (p<0.001) thus the null hypothesis is rejected. This implies that the intervention significantly improved awareness for earthquakes. On the other hand, for typhoons, both groups scored similarly, with the experimental group having a mean of 8.44 and the control group a mean of 8.42, resulting in a mean difference of only 0.02, which is not statistically significant (p=0.956), therefore, the null hypothesis is retained. This suggests the intervention did not influence typhoon awareness. Lastly, for floods, the experimental group showed a higher mean score (8.70) compared to the control group (7.62), with a mean difference of 1.08. This difference is statistically significant (p=0.0014), thus, the null hypothesis is rejected. This indicates that the intervention effectively enhanced flood awareness.

Table 4.

Difference Between the Pre-test and Post-test Results in the Level of Awareness of the Control Group Across All Disaster Types

Disaster	**Pre-test**		**Post-test**		**Mean Difference**	***t(df)***	***p***
	Mean	**SD**	**Mean**	**SD**		**At 0.05 level of Significance**	
Earthquake	6.36	1.37	6.34	1.39	0.02	0.10(49)	0.920
Typhoon	8.16	1.92	8.42	1.90	0.26	-0.89(49)	0.378
Flood	6.62	2.03	7.62	1.92	1	-4.38(49)	<0.001

Table 4 presents the differences between the pre-test and post-test awareness levels of the control group across earthquakes, typhoons, and floods. For earthquakes, the pre-test mean was 6.36 (SD = 1.37) and the post-test mean was 6.34 (SD = 1.39), with a mean difference of 0.02, indicating no significant difference (p = 0.920); thus, the null hypothesis was retained. For typhoons, the pre-test mean was 8.16 (SD = 1.92) and the post-test mean was 8.42 (SD = 1.90), with a mean difference of 0.26, which was also not significant (p = 0.378); therefore, the null hypothesis was retained. For floods, the pre-test mean was 6.62 (SD = 2.03), which increased to 7.62 (SD = 1.92) in the post-test, yielding a mean difference of 1.00 that was statistically significant (p < 0.001); thus, the null hypothesis was rejected.Overall, the control group showed a significant improvement only in flood awareness, while no significant changes were observed in earthquake and typhoon awareness.

Table 5.

Difference Between the Pre-test and Post-test Results in the Level of Awareness of the Experimental Group Across All Disaster Types

Disaster	Pre-test		Post-test		Mean Difference	*t(df)*	*p*
	Mean	**SD**	**Mean**	**SD**		**At 0.05 level of Significance**	
Earthquake	6.56	1.55	7.66	1.53	1.10	-4.56(49)	<0.001
Typhoon	7.60	1.66	8.44	1.40	0.84	-4.10(49)	<0.001
Flood	7.66	1.63	8.70	1.46	1.04	-5.56(49)	<0.001

Table 5 illustrates the differences between the pre-test and post-test results in the level of awareness of the experimental group across three disaster types: earthquakes, typhoons, and floods.

For earthquakes, the mean score increased from 6.56 (SD = 1.55) in the pre-test to 7.66 (SD = 1.53) in the post-test, with a mean difference of 1.10. The computed t-value of -4.56 and a p-value of <0.001 indicate a significant improvement in awareness after the intervention. Therefore, the null hypothesis is rejected.

For typhoons, the pre-test mean score was 7.60 (SD = 1.66), which rose to 8.44 (SD = 1.40) in the post-test, resulting in a mean difference of 0.84. The t-value of -4.10 and the p-value of <0.001 also demonstrate a significant increase in awareness. Thus, the null hypothesis is rejected.

Similarly, for floods, the pre-test mean score of 7.66 (SD = 1.63) improved to 8.70 (SD = 1.46) in the post-test, with a mean difference of 1.04. The t-value of -5.56 and the p-value of <0.001 confirm a significant enhancement in awareness levels. Therefore, the null hypothesis is rejected.

The results suggest that the intervention significantly improved the level of awareness of the experimental group for all disaster types, as evidenced by the substantial differences between the pre-test and post-test scores and the rejection of the null hypothesis in all categories.

CONCLUSION

The study found that student-designed infographics were highly effective in enhancing disaster awareness than traditional text-only materials among the Grade 7 students at Holy Cross Academy. Both groups showed moderate to high levels of awareness of earthquakes, typhoons, and floods before the intervention. While both groups had similar baselines, the experimental group demonstrated significantly greater improvements across all disaster types after using the student-designed infographic materials. In contrast, the control group showed limited progress, mainly in flood awareness. The consistent post-test outperformance of the experimental group underscores the value of infographics as an engaging and effective tool for disaster education.

REFERENCES

1. *Alrwele, N. S. (2017). Effects of infographics on student achievement and students' perceptions of the infographics. Journal of Education and Learning, 6(1), 232-239.*
2. *Amri, A., Sagala, S., & Lassa, J. (2017). Students' knowledge on disaster risk reduction: Insights from primary schools in Indonesia. International Journal of Disaster Risk Reduction, 23, 44-51.https://doi.org/10.1016/j.ijdrr.2017.03.009*
3. *Annette La Greca, Ph.D & Betty S. Lai, Ph.D (August, 2020). Understanding the Impacts of Natural Disasters on Children.*
4. *Aya Sale, Abeer Hassan Abdo Mostaf & Nesrin Ezzat Gamal El din (2019). The Effect of Infographics on Awareness of the Content of Public Awareness Advertisements. https://mjaf.journals.ekb.eg/article_252542.html?lang=en*
5. *Bontisesari, Muchlas Suseno & Irma Rasita Gloria Barus, 2022. Enhancing students' learning experiences using infographic-based materialsandtasks.https://www.researchgate.net/publication/362634062_*
6. *Çaka, C., & Dursun, Ö.Ö. (2022). The effect of different types of instructional materials on cognitive load, time spent, and motivation. Journal of Educational Technology Online, 5(3), 519-534.*
7. *Chauhan, S., & Saini, P. (2018). The role of visual aids in enhancing students' understanding of scientific concepts. Journal of Educational Research, 45(3), 213-226.*
8. *Coban, S., & Göktaş, Y. (2022). Which training method is more effective in earthquake training: Digital game, drill, or traditional training? Smart Learning Environments, 9(23), 1-24. https://doi.org/10.1186/s40561-022-00187-2*
9. *Cribbie, R. A., & Jamieson, J. (2004). Analyzing pre-post change. Understanding Statistics, 3(1), 3-34.*
10. *https://cribbie.info.yorku.ca/files/2017/05/pre_post_change_jennings_cribb ie_jds.pdf?x40568*
11. *Ebru Ulusoy, 2019. Importance of Visuals in Class Discussions. https://facultyresourcenetwork.org/symposium/november-2019/importance-of-visuals-in-class-discussions*
12. *Ennis-O'Connor, M. (2022, April 8). Why You Should Include Infographics In Your Content Marketing Strategy.*

13. Gliner, J. A., Morgan, G. A., & Leech, N. L. (2003). Pretest-posttest designs: Statistical approaches and cautions. Journal of the American Academy of Child & Adolescent Psychiatry, 42(4), 501-505.https://journals.cambridgemedia.com.au/
14. Gonzalez, A. M., Johnson, K. L., & Smith, T. M. (2019). The impact of infographics versus text-based materials on environmental science learning outcomes. Journal of Educational Technology & Society, 22(3), 25-38.
https://files.eric.ed.gov/fulltext/EJ1352383.pdf
15. Greving, S., and Richter, T. (2018). Examining the testing effect in university teaching: retrievability and question format matter. Front. Psychol. 9:2412. doi: 10.3389/fpsyg.2018.02412
https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.202
1.685245/full
16. Homa Bahmani, Yibin Ao, Dujuan Yang & Dongpo Wang (March, 2023). Students' evacuation behavior during an emergency at schools: A systematic literature review.
https://www.srcd.org/research/understanding-impactsnatural-disasters-children
17. Iona Bell, Nina Laurie, Oliver Calle, Maria Carmen, Amanda Valdez, Education for disaster resilience: Lessons from El Niño, Geoforum, Volume 148 (2024), 103919, ISSN 0016-7185,
https://doi.org/10.1016/j.geoforum.2023.103919.
18. Jiang, Y. (2020). The impact of infographics on student learning in disaster education. International Journal of Educational Technology, 35(2), 145-158.
19. Kuvondikovna, K. S., & Hakima, B. (2023). Designing Visual Aid. European Journal of Higher Education and Academic Advancement, 1(2), 165–167. Retrieved from
https://journal.silkroad-
20. science.com/index.php/EJHEAA/article/view/131
21. L Suhardjono, A Oscario, L Luzar and B Sriherlambang (2020). Infographic, data visualization, and the danger of reality distortion: The case study of Australia fire 2020.
https://iopscience.iop.org/article/10.1088/1755-1315/729/1/012127/pdf
22. Latimier Alice, Riegert Arnaud & Ramus Franck (2019) Does pre-testing promote better retention than post-testing? npj Science of Learning volume 4, Article number: 15
https://www.nature.com/articles/s41539-019-0053-1
23. Lyra, K. T., Isotani, S., Reis, R. C. D., Marques, L. B., Pedro, L. Z., Jaques, P. A., & Bitencourt, I. G. (2016). Infographics or graphics-text: Which material is best for robust learning? arXiv:1605.09170.
24. Mansour Alwadei1 & Mohammed Ali Mohsen1 (2023) Investigation of the use of infographics to aid second language vocabulary learning Amjaad https://doi.org/10.1057/s41599-023-01569-2
25. Mayer, R. E. (2009). Multimedia learning (2nd ed.). Cambridge, England: Cambridge University Press.
https://ctl.wiley.com/principles-of-multimedialearning
26. McGraw Hill Canada, 2019. Richard Mayer's Cognitive Theory of Multimedia Learning https://www.mheducation.ca/blog/richard-mayers-cognitivetheory-of-multimedia-learning
27. Michael K. Lindell, Ann Bostrom, James D. Goltz and Carla S. Prater (2021). Evaluating hazard awareness brochures: Assessing the textual, graphical, and numerical features of tsunami evacuation products.
https://www.sciencedirect.com/science/article/abs/pii/S2212420921003277
28. Mohd Fadzil, Hidayah. (2018). Designing infographics for the educational technology course: Perspectives of preservice science teachers. Journal of Baltic Science Education. 17. 8-18. 10.33225/jbse/18.17.08.
29. MSc, J. Soyibo (2023, August 1). Visualizing Information for Impact: The Power of Infographics.
30. https://www.linkedin.com/pulse/visualizing-informationimpact-power-infographics-soyibo-msc
31. Nediger, M. 2023 What is an Infographic? Examples, Templates, Design Tips https://venngage.com/blog/what-is-an-infographic/
32. Nizar B. Said & Vico C.L. Chiang (January, 2020). The knowledge, skill competencies, and psychological preparedness of nurses for disasters: A systematic review.
https://www.sciencedirect.com/science/article/abs/pii/S1755599X19300928
33. Official Gazette. Philippine Disaster Risk Reduction and Management Act of 2010
https://www.officialgazette.gov.ph/2010/05/27/republic-act-no-10121/
34. Opabola, E.A., Galasso, C. Informing disaster-risk management policies for education infrastructure using scenario-based recovery analyses. Nat Commun 15, 325 (2024).
https://doi.org/10.1038/s41467-023-42407-y
35. Petty, T. L., Green, J. L., & Silva, R. M. (2017). Comparing visual and text-based materials in improving understanding and performance in environmental
36. science courses. Journal of Environmental Education, 48(5), 273-286.https://files.eric.ed.gov/fulltext/EJ1407658.pdf
37. Philippines Angara Renews Call for Mandatory Disaster Risk Education in Primary Schools." MENA Report, vol.,no. , 2019, p.
https://www.deped.gov.ph/2015/08/12/do-37-s-2015-the-comprehensivedisaster-risk-reduction-and-management-drrm-in-basic-educationframework/
38. Proulx, K., & Aboud, F. 2019. Disaster risk reduction in early childhood education: Effects on preschool quality and child outcomes. International Journal of Educational Development, 66.https://doi.org/10.1016/j.ijedudev.2019.01.007
39. Provincial Planning and Development Office Bohol. Active Faults Map of Province of Bohol.
https://ppdo.bohol.gov.ph/ppdofiles/Maps/PDF%20Maps/Hazard%20Maps/HazardMap_ActiveFaults_Update_2016.pdf
40. Provincial Planning and Development Office Bohol. Tsunami Hazard Map of Province of Bohol.
https://ppdo.bohol.gov.ph/ppdofiles/Maps/JPG%20Maps/Hazard%20Maps/HazardMap_Tsunami_Update_2016.jpg
41. Radwan, Ashraf & Alharbi, Reham & Albeladi, Faris & Alzahrani, Amal & Alnfaiei, Joudi & Abualhamael, Maya & Hazem, Reem & Aldalbhi, Wasan & Bajouh, Osama & Abdou, Abdelmageed & Sabban, Hussein & Alzahrani, Khames. (2023). Knowledge and awareness level assessment of PCOS among females in Saudi Arabia. Medical Science. 27. 1-10.
10.54905/disssi/v27i137/e303ms3149.
42. Rina Suyani Oktari , Khairul Munadi , Rinaldi Idroes & Hizir Sofyan (December, 2020). Knowledge management practices in disaster management: Systematic review.
https://www.sciencedirect.com/science/article/abs/pii/S2212420920313832
43. Saño, E.A. (2010). Primer on the Disaster Risk Reduction and Management (DRRM) Act of 2010. Retrieved from:
http://downloads.caraga.dilg.gov.ph/Disaster%20Preparedness/DRRM%2 0Act20Primer.pdf.
44. Shaw, R., Shiwaku, K., & Kobayashi, M. (2004). Linking experience, education, perception, and earthquake preparedness. Disaster Prevention and Management: An International Journal, 13(1), 39-49.
https://doi.org/10.1108/09653560410521689
45. Sheikh, M. 2024 What is an Infographic? (Examples, Tips and Templates) https://visme.co/blog/what-is-an-infographics/

46. *Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. Cognitive Science, 12(2), 257-285. https://www.sciencedirect.com/science/article/abs/pii/S221242092300064 X*
47. *Thakrar, R., Alaparthi, G. K., Kumar, S. K. K., Vaishali, K., Zulfeequer, C. P. & Aanad, R. (2014). Awareness in patients with COPD about the disease and pulmonary rehabilitation: A survey. Lung India, 31 (12), 134 - 138.*
48. *Traboco L, Pandian H, Nikiphorou E, Gupta L. Designing Infographics: Visual Representations for Enhancing Education, Communication, and Scientific Research. J Korean Med Sci. 2022 Jul 11;37(27):e214. doi: 10.3346/jkms.2022.37.e214. PMID: 35818705; PMCID: PMC9274103.*
49. *Van Merriënboer, J. J. G., & Sweller, J. (2005). Cognitive Load Theory and Complex Learning: Recent Developments and Future Directions. Educational Psychology Review, 17(2), 147–177. https://doi.org/10.1007/s10648-005-3951-0*
50. *VariQuest Visual Kinesthetic Learning Suite, 2021. The Importance of Visual Aids in Teaching. https://info.variquest.com/blog/the-importance-of-visual-aidsin-teaching*
51. *World Health Organization (2017). Bohol Earthquake: One year on. https://www.who.int/philippines/news/feature-stories/detail/boholearthquake-one-year-on Yavar, Bijan & mirtaheri, mansour & farajnezam, mohammad & Mirtaheri, Maisam. (2012). Effective Role of Infographics on Disaster Management Oriented Education and Training. 10.13140/RG.2.1.3317.20*