

Developing and Validating a Disaster Preparedness Assessment Tool: Expert-Guided Validation of a Student-Focused Questionnaire

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ARTICLE INFO

Keywords: Disaster Preparedness, Assessment Tool, Expert Validation, Instrument Development, Disaster Risk Reduction

Received : 13, March

Revised : 15, April

Accepted: 17, May

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ABSTRACT

Knowing how prepared students are can make a real difference in saving lives and reducing harm during increasing disasters. A well-designed tool that measures student preparedness offers schools a more straightforward path to improve safety efforts and support students more effectively. A student-focused questionnaire on disaster preparedness was created through a careful review of local literature and refined through expert guidance. The study established a validated and reliable tool to measure student disaster preparedness. Results confirmed strong expert agreement on the questionnaire's clarity and relevance, and the pilot testing with students demonstrated high levels of engagement and understanding. These findings support the tool's use for educational assessments and preparedness planning among young populations.

INTRODUCTION

Disaster preparedness refers to the actions and plans individuals and communities undertake to effectively respond to and recover from natural or artificial emergencies. It involves being informed, having supplies, knowing evacuation routes, and understanding roles during a disaster (Vicario-Merino et al., 2019). In recent years, the increasing frequency of natural hazards such as typhoons, earthquakes, and floods in the Philippines has highlighted the importance of preparedness at all levels, especially in schools where the safety of students is a critical concern (Balita, 2024). Preparing students for such events helps protect lives and contributes to quicker recovery and less disruption in their education (Tuquero et al., 2025). As such, disaster preparedness has become a key area of focus for safety and public awareness in educational institutions.

In the Philippines, schools and universities have implemented various programs and initiatives to raise awareness and enhance disaster readiness among students. These include evacuation drills, information campaigns, and integrating disaster-related topics into the curriculum (Dollete, 2020; Eleorda et al., 2025). However, while these initiatives are commendable, no widely used or standardized tool currently measures how prepared students are for disasters. This presents a challenge in evaluating the effectiveness of existing programs and identifying specific areas that need improvement. Without a reliable way to assess student preparedness, institutions may struggle to make informed decisions and tailor interventions that address the needs of their learners (Gundran et al., 2023).

Given the lack of assessment tools explicitly focused on student disaster preparedness, a questionnaire must be created to provide measurable insights into students' readiness for emergencies. While research on disaster preparedness exists (Medel et al., 2020; Lilltwhite & Wolbrig, 2022; Labrague & Hammad, 2024), few studies have concentrated on developing practical tools aimed at evaluating student awareness, attitudes, and behaviors in the context of disasters. This gap limits the ability of educators and administrators to monitor progress and implement evidence-based improvements. Schools can strengthen their preparedness strategies by addressing this lack of assessment instruments and ensuring students are better equipped for unexpected events.

The study seeks to create a questionnaire that clearly and meaningfully captures students' level of disaster preparedness. This involves crafting items that reflect real-life scenarios and behaviors and refining the tool with input from experts to ensure that it is both relevant and understandable for its target users. This approach provides a practical instrument schools can use to assess preparedness and guide more focused and effective interventions.

LITERATURE REVIEW

Disaster Preparedness

Disaster preparedness involves equipping individuals and communities with the knowledge, skills, and resources necessary to respond to emergencies effectively (Labrague & Hammad, 2024). In schools, students must understand what actions to take before, during, and after a disaster to protect themselves and others. Students are often among the most vulnerable groups during emergencies, especially when they lack access to accurate information and proper training (Rico, 2019; Ventura & Madrigal, 2020; Cruz & Ormilla, 2022). When prepared, students are more likely to remain calm, make informed decisions, and avoid panic in crises. Therefore, building disaster preparedness among the youth is a safety measure and a long-term investment in community resilience (Aquino et al., 2020; Lapada, 2022).

Flood Preparedness

Flooding is one of the Philippines' most frequent and damaging disasters, often caused by typhoons, heavy rainfall, and poor drainage systems (Dollete, 2020). Communities in low-lying and coastal areas are particularly at risk, making preparedness vital for survival and safety (Pascual et al., 2024). Flood preparedness includes being aware of flood-prone zones, having evacuation plans, securing important documents, and knowing what to do when warnings are issued (Kurata et al., 2023). For students, this means understanding the early signs of danger, protecting themselves at school and home, and responding calmly and quickly (Cubillas et al., 2022; Viado & Department, 2023). Teaching flood preparedness in schools helps students develop practical responses that can prevent injuries and reduce property loss.

Earthquake Preparedness

The Philippines is located along the Pacific Ring of Fire, making it prone to frequent and sometimes destructive earthquakes. Because earthquakes strike without warning, preparedness is critical to minimize harm (Dollete, 2020). Earthquake preparedness focuses on teaching people how to "*drop, cover, and hold*," identifying safe and unsafe spots in a building, and preparing emergency kits (Vicario-Merino et al., 2019; Dariagan et al., 2021; Gundran et al., 2023). Students, in particular, must be trained through regular drills and instruction to react quickly and safely when an earthquake occurs (Rico, 2019; Cruz & Ormilla, 2022). Awareness of what to do before and after the shaking also helps reduce fear and confusion, contributing to a safer learning environment.

Landslide Preparedness

Landslides are another common hazard in the Philippines, especially in mountainous and heavily deforested areas, and are often triggered by prolonged rainfall or earthquakes (Dollete, 2020). Preparedness for landslides includes identifying high-risk zones, avoiding construction or habitation in vulnerable areas, and staying alert during heavy rains. For students living in or near landslide-prone areas, it is important to recognize warning signs such as cracks in the ground or tilting trees (Dariagan et al., 2021; Prastyo et al., 2021; Cruz & Ormilla, 2022; Solano et al., 2024). Schools can support preparedness by providing safety instructions and conducting risk assessments in their surroundings (Calamba, 2024; Lavilles & Hordista, 2024). Teaching students about landslide risks fosters a culture of awareness and early action.

Typhoon Preparedness

Typhoons regularly affect the Philippines, bringing strong winds, heavy rains, and widespread damage. Being prepared has become increasingly important as these storms have become more intense due to climate change (Dollete, 2020). Typhoon preparedness includes monitoring weather updates, securing homes and school buildings, and understanding evacuation procedures. Students should be educated on the potential dangers of typhoons, such as flying debris, flooding, and power outages, and what steps to take to stay safe (Vicario-Merino et al., 2019; Dariagan et al., 2021; Cruz & Ormilla, 2022; Rico, 2022; Kurata et al., 2023). Including typhoon preparedness in school programs ensures that students are aware of the risks and ready to act when needed.

Fire Preparedness

Fires, whether caused by electrical faults, open flames, or natural hazards, pose a significant threat to safety in both homes and schools across the Philippines (Dollete, 2020). Fire preparedness includes knowing how to prevent fires, using fire extinguishers, recognizing fire exits, and practicing evacuation routes. For students, this also means learning not to panic, staying low to avoid smoke inhalation, and listening to instructions during a fire drill (Vicario-Merino et al., 2019; Dariagan et al., 2021; Gundran et al., 2023). Schools play a key role in reinforcing these practices, ensuring students have the knowledge and confidence to respond quickly during fire emergencies (Bollettino et al., 2020; Delaliarte et al., 2024).

Conceptual Framework of the Study

This study aligns with Republic Act No. 10121, also known as the Philippine Disaster Risk Reduction and Management Act of 2010, which promotes a proactive approach to disaster management through education, awareness, and capacity-building. The law emphasizes the importance of involving all sectors, especially the youth, in disaster preparedness and response efforts. In line with this, schools must integrate disaster risk reduction into their systems and curricula to build a culture of safety and resilience. This study directly supports the law's goals by focusing on developing preparedness tools and providing

schools with resources to assess and strengthen their efforts in preparing students for disasters.

METHODOLOGY

Research Design

The study follows a methodological research design (Sileyew, 2019) focused on developing and validating instruments to improve research and practice. The process centers on creating a reliable and relevant questionnaire that measures student disaster preparedness. Through this approach, the study systematically constructs the assessment tool, subjects it to expert validation, and ensures that each item aligns with the intended constructs.

Selection Criteria

To ensure the quality and relevance of the evaluation, the experts selected for the study were professionals with backgrounds in psychology, disaster management, or education. These fields are essential in shaping a tool that addresses preparedness's cognitive, behavioral, and educational dimensions. Psychology experts help ensure that the items are age-appropriate and consider emotional responses, while disaster management professionals assess the accuracy and applicability of the content. Education experts ensure that the questionnaire's language, structure, and delivery are suitable for students. Their combined expertise strengthens the evaluation's credibility and improves the instrument's overall quality.

Table 1. Information of the Expert Evaluators (N=23)

Field	F	%
Psychology	3	13.04
Disaster Management	12	52.17
Education	8	34.78

The mix of expertise, as presented in Table 1, ensured that the content of the assessment tool was examined from multiple important perspectives, enhancing its relevance and applicability. The inclusion of professionals who are both practitioners and academics added further depth to the validation process. Their agreement to participate highlights the perceived importance of the tool and supports the reliability of the feedback used to refine it.

Expert Evaluation of the Developed Questionnaire

The experts were guided in their evaluation using criteria adapted from Solanon et al. (2020), which provided a structured framework for assessing the questionnaire's clarity, relevance, and comprehensiveness. Each expert was given a copy of the tool and asked to rate each item based on specific indicators using the provided evaluation form. This method allowed for consistent feedback across all reviewers, ensuring the validation process was systematic and grounded in established standards. Suggestions and comments from the experts were also gathered to refine the content further and enhance the overall effectiveness of the tool.

Pilot-Testing of the Developed Questionnaire

The pilot-testing phase involved the administration of the developed questionnaire to a total of 1,758 college students across three educational institutions. This stage was crucial in evaluating how well the questionnaire functioned in an actual student setting, helping identify the clarity of items and the overall flow of the tool. Participants were selected from varied academic programs to ensure a diverse pool of respondents, allowing for a more comprehensive assessment of the instrument's usability and effectiveness. Throughout the pilot-testing process, strict adherence to ethical standards and data privacy protocols was observed to protect the rights and confidentiality of all participants. The data gathered during this phase provided insights that confirmed the tool's readiness for broader use and contributed to its refinement based on actual student responses.

Data Gathering Procedure

The initial step in gathering data involved developing the questionnaire, which was informed by a comprehensive review of local literature, guidelines, and existing studies related to disaster preparedness in the Philippine context. This process helped ensure that the tool's content was relevant, culturally appropriate, and reflective of the actual disaster risks and experiences commonly encountered by students in the country. Items were created to cover various types of disasters and the essential knowledge, attitudes, and practices associated with preparedness. After completing the questionnaire draft, experts were invited to review and evaluate its content. Each expert received a copy of the tool and the evaluation criteria and was given one week to examine the items thoroughly. This time frame allowed them to assess each question's appropriateness, clarity, and comprehensiveness. Their feedback was collected and used to improve the tool before it was tested with the student population.

Treatment of Data

Following expert evaluation, the questionnaire was subjected to a content validity index (CVI) analysis to determine how well the items represented the intended concepts (Yusoff, 2019). This statistical method helped identify which items needed revision, removal, or retention. Once revised, the questionnaire was pilot-tested with a group of students from selected institutions to ensure that the tool was understandable, appropriate, and effective in capturing information related to disaster preparedness. The responses from the pilot test were also used to refine the questionnaire further.

RESEARCH RESULT

Table 2 summarizes the mean and qualitative interpretation of the expert's disaster readiness survey questionnaire evaluation. The assessment focused on key aspects, including ethical considerations, question construction, and accuracy and thoroughness of the questions.

Table 2. Summary of the Content Validity Index (CVI) Regarding the Disaster Readiness Survey Questionnaire

Category	Mean	Qualitative Interpretation
Ethical Consideration	0.918	Excellent Content Validity
Construction of Questions	0.951	Excellent Content Validity
Accuracy / Thoroughness of Questions	0.943	Excellent Content Validity
Overall	0.937	Excellent Content Validity

The results in Table 2 clearly indicate strong agreement among experts regarding the relevance of the items in the assessment tool. Most items received ratings that fell within the highest category, suggesting that the tool successfully captured important aspects of disaster preparedness. A few items received slightly lower scores, but none fell below acceptable standards, indicating that the questionnaire's overall content was appropriate and aligned with the intended focus. These results confirm that the tool is well-developed in measuring the intended preparedness components.

Table 3 summarized the mean and qualitative interpretation of the expert's evaluation on the individual factors of the disaster readiness survey questionnaire.

Table 3. Summary of the Content Validity Index (CVI) Regarding the Individual Factor of the Disaster Readiness Survey Questionnaire

Factor	Mean	Qualitative Interpretation
General Preparedness	0.917	Excellent Content Validity
Flood Preparedness	0.944	Excellent Content Validity
Earthquake Preparedness	0.948	Excellent Content Validity
Landslide Preparedness	0.939	Excellent Content Validity
Typhoon Preparedness	0.941	Excellent Content Validity
Fire Preparedness	0.934	Excellent Content Validity
Overall	0.937	Excellent Content Validity

Table 3 presents the clarity of the questionnaire items, and the results reflect a similarly high level of expert agreement. Most items were considered clear and understandable, essential for a student tool. The consistently high scores across items suggest that the wording and structure effectively communicated the intended meaning. Where slightly lower scores occurred, they remained within

acceptable limits, and such feedback can guide minor revisions. The result confirms that the tool is relevant and accessible to its intended users.

Table 4 presents the reliability results of the individual factors and the overall of the disaster readiness survey questionnaire.

Table 4. Reliability Result of the Disaster Readiness Survey Questionnaire (N=1758)

Factor	No. Items	Cronbach-Alpha	Interpretation
General Preparedness	7 Items	0.928	Excellent
Flood Preparedness	12 Items	0.945	Excellent
Earthquake Preparedness	8 Items	0.883	Good
Landslide Preparedness	9 Items	0.927	Excellent
Typhoon Preparedness	9 Items	0.860	Good
Fire Preparedness	9 Items	0.846	Good
Overall	54 Items	0.953	Excellent

The instrument was then piloted to 1,758 students, with the results summarized in Table 4. The findings demonstrate that the participants generally received and understood the questionnaire. Most items achieved high mean scores, suggesting students could comprehend and effectively engage with the content. These results support the questionnaire's usability and reliability when applied to a larger population. The pilot test reinforces the tool's readiness for full implementation, as it captured meaningful data from a broad student sample. The positive result reinforces the tool's overall usability and quality.

DISCUSSION

Flood Preparedness Items

The result shows that the items under flood preparedness were effectively categorized and rated positively during the pilot implementation. Students clearly understood actions needed before, during, and after a flood, with mean scores indicating strong agreement across the statements. These results suggest the items were appropriate, relevant, and easy to understand. The structure of the questions provided a comprehensive view of students' awareness and readiness to respond to flood-related emergencies.

These results support the effectiveness of the developed questionnaire in assessing students' preparedness for floods. By reflecting on real-life scenarios and practical actions, the tool successfully captured the necessary behaviors and attitudes essential in flood-prone areas (Bollettino et al., 2020; Dollete, 2020; Dariagan et al., 2021; Kurata et al., 2023; Pascual et al., 2024). The result confirms that the inclusion of flood preparedness items contributes meaningfully to the overall purpose of creating a student-focused disaster preparedness tool that can guide schools in identifying areas for improvement and in promoting safety during flood events (Rico, 2019; Cruz & Ormilla, 2022; Cubillas et al., 2022; Viado & Department, 2023).

Earthquake Preparedness Items

The results reveal that earthquake preparedness items were well-constructed and clearly understood by student respondents, as shown by the consistently high mean scores during the pilot test. The questions covered key actions such as “*duck, cover, and hold*,” securing breakable objects, and recognizing safe zones, all critical during earthquakes. The responses reflected a strong awareness of these procedures, indicating that students are generally informed and capable of taking proper safety measures.

The results demonstrate that the questionnaire successfully captures essential aspects of earthquake preparedness, making it a valuable tool for assessing readiness in schools located in earthquake-prone areas. Including these items ensures that students’ knowledge and actions specific to earthquakes are measured accurately (Vicario-Merino et al., 2019; Dollete, 2020; Dariagan et al., 2021; Gundran et al., 2023). The result contributes to the broader goal of creating a targeted and reliable assessment instrument that can support educational institutions in promoting a culture of disaster awareness and safety (Rico, 2019; Ventura & Madrigal, 2020; Cruz & Ormilla, 2022; Viado & Department, 2023).

Landslide Preparedness Items

The result shows that students responded positively to the items related to landslide preparedness, with mean scores reflecting good understanding and readiness. The questions emphasized important preventive measures, such as recognizing warning signs, avoiding steep slopes during heavy rain, and following evacuation protocols. These responses suggest that students know the necessary steps to minimize risks during landslide events.

The data underscores the importance of including landslide preparedness in the overall questionnaire. Since landslides are common in certain regions of the country, assessing students’ knowledge and behavior related to this hazard is crucial. The favorable responses confirm that the instrument successfully addresses this need and that students can benefit from further education and training guided by the insights gathered through this tool (Dollete, 2020; Dariagan et al., 2021; Cruz & Ormilla, 2022; Calamba, 2024; Lavilles & Hordista, 2024; Solano et al., 2024).

Typhoon Preparedness Items

The results under typhoon preparedness indicate that students understood the critical preparations and responses needed before, during, and after a typhoon. Items on securing homes, preparing emergency kits, and listening to official warnings received strong agreement. The pilot data revealed that these questions were practical and relatable to students’ experiences, particularly in areas frequently affected by typhoons.

These findings reinforce the value of incorporating typhoon preparedness into the questionnaire. Given the regular occurrence of typhoons in the Philippines, educational tools must reflect this reality. The responses validate that the items are effective in measuring preparedness and can serve as a basis for improving school-based disaster education programs to help students be more proactive and resilient (Rico, 2019; Vicario-Merino et al., 2019; Bollettino et al., 2020; Dariagan et al., 2021; Rico, 2022; Kurata et al., 2023; Viado & Department, 2023).

Fire Preparedness Items

The result shows that fire preparedness items were well-understood by students, with mean scores indicating that they recognized safety protocols such as identifying exits, avoiding panic, and calling emergency services. The clarity and relatability of these items led to a strong response from participants, which shows their awareness of fire risks and appropriate actions in such emergencies. These results confirm the importance of assessing fire preparedness among students, especially in school settings where fire drills and safety plans are necessary. Including this aspect in the questionnaire helps ensure a more complete evaluation of disaster readiness. The student's ability to respond confidently to these items suggests that the tool can effectively highlight areas for further training and enhance the overall safety culture within educational institutions (Vicario-Merino et al., 2019; Bollettino et al., 2020; Dariagan et al., 2021; Gundran et al., 2023; Delaliarte et al., 2024).

Disaster Preparedness Questionnaire

The result highlights the developed disaster preparedness questionnaire's successful validation and pilot testing. Additionally, the expert validators evaluated the instrument favorably across various criteria. Their feedback ensured the questionnaire was grounded in practical knowledge and professional expertise. The result further reflects that the tool covered essential disaster types floods, earthquakes, landslides, typhoons, and fire with each item aligned to specific safety practices and preparedness actions. Moreover, the summary of the results of the pilot test shows strong positive responses and high mean scores across all disaster categories, indicating that the questionnaire was understood and responded to appropriately by the intended participants.

These findings affirm that the instrument is aligned with its intended purpose of measuring student disaster preparedness. The experts' favorable evaluation confirms that the questionnaire content was comprehensive and appropriate for the target population. The consistency of the pilot test results suggests that students were able to relate to the questions and demonstrate their awareness and knowledge of proper disaster response (Vicario-Merino et al., 2019; Bollettino et al., 2020; Dariagan, 2021; Gundran et al., 2023; Kurata et al., 2023). These results imply that the tool can serve as a reliable measure for identifying preparedness levels among students, while also pointing out gaps that schools and communities can address through training or interventions (Rico, 2019; Dollete, 2020; Cruz & Ormilla, 2022; Viado & Department, 2023).

The questionnaire is a well-developed and validated tool that schools and education-focused agencies can use to assess student readiness for disasters. Its clear language, structured format, and context-specific items make it accessible and practical (Aquino et al., 2020; Ventura & Madrigal, 2020; Lapada, 2022; Rico, 2022). As a product of collaboration between experts and grounded in real-world scenarios, it provides a strong foundation for promoting safety and preparedness among young people. This tool not only assesses current knowledge but also has the potential to guide future disaster risk reduction education in schools and communities (Medel et al., 2020; Lillywhite & Wolbring, 2022; Labrague & Hammad, 2024; Eleorda et al., 2025; Tuquero et al., 2025).

CONCLUSIONS AND RECOMENDATIONS

The study results showed that the disaster preparedness questionnaire was successfully validated by experts and effectively pilot-tested among students. The expert evaluations confirmed that the questionnaire items were relevant, clearly stated, and appropriate for measuring preparedness across different types of disasters. The pilot results further revealed that students could respond to the instrument with clarity and consistency, showing high levels of understanding across the five disaster categories. These findings indicate that the tool is suitable for assessing disaster preparedness in a student population and is grounded in expert input and student responses.

Additionally, the study offers new insight into how disaster preparedness can be systematically measured among students using a context-based and expert-guided approach. The result shows that preparedness is a multi-dimensional concept that students can engage with meaningfully when presented with structured, clearly defined questions. The validated questionnaire contributes significantly by offering an accessible and comprehensive tool that reflects local disaster experiences while grounded in professional standards and student capacities.

ADVANCED RESEARCH

Future studies can expand on these findings by testing the questionnaire in different educational settings, such as rural schools or higher education institutions, to assess its adaptability and relevance. Researchers may also explore longitudinal studies that track changes in disaster preparedness over time using this tool. Furthermore, studies incorporating the questionnaire as a basis for intervention programs or curriculum development can evaluate its impact on improving preparedness levels among learners.

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