STUDENT JOURNAL OF
TECHNOLOGY AND EDUCATIONAL RESEARCH
ISSN (Print): 2945-381X; (Online): 3082-5563 | VOLUME 3, ISSUE 2 (2026)

EARTHQUAKE PREPAREDNESS AMONG PUBLIC ELEMENTARY SCHOOL TEACHERS: BASIS FOR A SCHOOL-BASED DISASTER RISK PREPAREDNESS PROGRAM

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Article History:
Received: Sept. 9, 2026
Revised: October 22, 2026
Accepted: Nov. 8, 2026

Keywords:
Earthquake preparedness; Disaster risk reduction; Elementary school teachers; Teaching experience; School safety

DOI:
10.65141/sjter.v3i2n4



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Abstract

Effective preparedness requires not only awareness of earthquake-related hazards and safety measures but also the consistent implementation of appropriate preparedness practices. This study assessed the earthquake preparedness of public elementary school teachers in Quirino, Isabela, and examined differences according to sex, educational attainment, and years of teaching experience. The findings revealed that the respondents were predominantly female and had pursued postgraduate studies. Overall, teachers reported a very high level of earthquake preparedness. Participation in school safety and maintenance activities obtained the highest mean, while the availability of basic emergency tools and equipment received the lowest. No statistically significant differences were found in preparedness according to sex and educational attainment. However, significant differences emerged when respondents were grouped according to years of teaching experience, with teachers having 16 years or more of service demonstrating higher preparedness levels. The findings highlight the importance of sustaining school safety initiatives while strengthening the availability of emergency equipment. Future research may explore the factors underlying differences across teaching experience groups and evaluate targeted disaster preparedness interventions to improve school earthquake resilience.

INTRODUCTION

Earthquakes pose serious threats to human lives and infrastructure, making preparedness an essential component of effective disaster risk reduction. Krichen et al. (2023) emphasized the need for proactive disaster management strategies to minimize disaster-related losses. In schools, preparedness involves more than conducting earthquake drills; it requires adequate resources, clear emergency procedures, coordinated responsibilities, and personnel capable of responding appropriately during emergencies. Marzban et al. (2025) highlighted the importance of community-based disaster risk management, which recognizes the role of local institutions in strengthening collective preparedness.

International frameworks, particularly the Sendai Framework for Disaster Risk Reduction 2015–2030 (UNDRR, 2015) and the Comprehensive School Safety Framework (GADRRRES, 2022), emphasize understanding disaster risks, reducing vulnerabilities, strengthening preparedness, and promoting safer learning environments. In the Philippines, Republic Act No. 10121, or the Philippine Disaster Risk Reduction and Management Act of 2010, provides the legal foundation for disaster risk reduction and management. The Department of Education supports these efforts through school disaster risk reduction and management teams, earthquake drills, evacuation procedures, contingency plans, and preparedness education. However, the effectiveness of these initiatives depends largely on the readiness of the personnel responsible for implementing them.

Teachers play a critical role in school earthquake preparedness because they are often directly responsible for protecting learners during emergencies. Their responsibilities include identifying hazards, communicating safety procedures, supervising evacuation, accounting for learners, providing appropriate first aid within their training, and helping learners remain calm. Manuel et al. (2025) highlighted the importance of teachers' disaster-related knowledge and crisis management capacities, while Yang et al. (2025) emphasized the need for comprehensive preparedness training and adequate resources. These findings suggest that teachers must possess not only knowledge of earthquake safety procedures but also the practical skills and confidence necessary to respond effectively under pressure.

Nevertheless, teachers' preparedness may vary according to their training, previous disaster experiences, professional background, access to emergency resources, and administrative support. Participation in earthquake drills and other preparedness activities does not necessarily guarantee readiness for an actual disaster. Consequently, assessing teachers' preparedness is important in identifying existing strengths and areas requiring improvement. Although disaster preparedness has received attention in educational and community settings, localized evidence on the earthquake preparedness of public elementary school teachers in the Municipality of Quirino, Isabela, remains necessary.

In this context, the present study determines the level of earthquake preparedness among public elementary school teachers in the Municipality of Quirino, Isabela. Specifically, it examines their readiness to respond to earthquake-related emergencies to identify areas for improvement and provide a local evidence base for strengthening school disaster preparedness practices.

METHODS

Research Design

A descriptive-comparative research design was employed to assess the level of earthquake preparedness among public elementary school teachers in Quirino, Isabela, Philippines. The study examined teachers' level of preparedness and determined whether significant differences existed across selected demographic profiles.

Respondents and Locale of the Study

The study involved 70 public elementary school teachers in Quirino, Isabela, Philippines, during School Year 2026–2027. Participants were selected through simple random

sampling to ensure that each eligible teacher had an equal probability of selection. This sampling procedure was employed to minimize selection bias and support the representativeness of the sample relative to the target population.

Research Instrument

Data were collected using a structured questionnaire adapted from Medenilla et al. (2024), titled Earthquake Preparedness of People in Rural Community: A Basis for Disaster Risk Mitigation Intervention. The instrument consisted of two parts: Part I gathered respondents' demographic profile, while Part II assessed earthquake preparedness.

Data Gathering Procedure and Analysis

Prior to data collection, the researchers secured the necessary approvals from the Graduate School Dean, the Schools Division Superintendent of Isabela, and the concerned school heads. Informed consent was obtained from the selected participants before the questionnaires were personally administered. The completed questionnaires were retrieved, organized, and tabulated for statistical analysis.

The data were analyzed using appropriate descriptive and inferential statistical techniques. Frequency count and percentage were used to summarize the respondents' demographic profiles. Weighted mean was employed to determine the level of earthquake preparedness and awareness of the respondents. Independent-samples t-test and one-way analysis of variance (ANOVA) were used to examine significant differences in earthquake preparedness across selected profile variables. All hypotheses were tested at the 0.05 level of significance.

Ethical Considerations

In accordance with Republic Act No. 10173, personal information was protected through coded responses, secure data handling, and restricted access. Results were reported only in aggregate form. The researcher also maintained accuracy, objectivity, transparency, and proper source acknowledgment in accordance with APA 7th edition to uphold academic integrity.

RESULTS AND DISCUSSION

A. Profile of the Respondents

Table 1 presents the demographic profile of public elementary school teachers in Quirino, Isabela. Female teachers comprised the majority of respondents (82.9%), while males accounted for 17.1%, indicating a predominantly female sample.

Table 1. Demographic Profile of the Respondents

Profile	Frequency (n=70)	Percent
Sex		
Male	12	17.1
Female	58	82.9

Educational Attainment		
Bachelor's Degree	5	7.1
With Master's Units	46	65.7
Master's Degree	16	22.9
With Doctoral Units	3	4.3
Years in Service		
1-5 years	19	27.1
6-10 years	11	15.7
11-15 years	12	17.1
16-20 years	13	18.6
21 years and above	15	21.4

Regarding educational attainment, most respondents had earned master's units (65.7%), followed by those who had completed a master's degree (22.9%). Meanwhile, 7.1% held a bachelor's degree, and 4.3% had earned doctoral units. These findings indicate that most respondents had pursued postgraduate studies.

In terms of years of service, the largest group had 1–5 years of experience (27.1%), followed by those with 21 years or more (21.4%). Teachers with 16–20 years of service accounted for 18.6%, those with 11–15 years comprised 17.1%, and those with 6–10 years represented 15.7%. The distribution reflects a mix of early-career and experienced teachers, providing varied professional perspectives on earthquake preparedness.

B. Level of Earthquake Preparedness

Table 2. Respondents' Level of Earthquake Preparedness

Items	Mean	Qualitative Description
1. Emergency flashlights or portable lighting devices are readily available in my classroom or work area.	3.50	Very Prepared
2. A properly stocked first-aid kit is available and accessible in my classroom or school.	3.46	Very Prepared
3. Electrical equipment in my classroom or work area is properly positioned to minimize hazards during and after an earthquake.	3.43	Very Prepared
4. The school has accessible alternative resources for food and water during prolonged emergencies.	3.44	Very Prepared
5. Essential medicines and emergency medical supplies are available in the school when needed.	3.44	Very Prepared
6. Heavy furniture, cabinets, shelves, and equipment in my classroom are securely fastened to prevent them from falling during an earthquake.	3.34	Very Prepared
7. Emergency food supplies and potable drinking water are available in the school for disaster situations.	3.37	Very Prepared
8. Basic emergency tools and equipment for minor repairs are available in the school after an earthquake.	3.24	Prepared
9. A battery-operated or rechargeable radio is available for emergency communication in the school.	3.36	Very Prepared

10. Heavy instructional materials and equipment are stored on lower shelves or are properly secured.	3.41	Very Prepared
11. The school maintains an adequate supply of potable water for emergency use.	3.53	Very Prepared
12. I participate in activities that promote compliance with earthquake safety standards in the school.	3.44	Very Prepared
13. School facilities and equipment are regularly inspected to ensure earthquake preparedness.	3.49	Very Prepared
14. I support and participate in initiatives that improve the earthquake safety of school facilities.	3.46	Very Prepared
15. I know and follow the designated evacuation routes and assembly areas during earthquake drills and actual emergencies.	3.46	Very Prepared
16. Emergency sanitation and hygiene supplies are available and accessible in the school.	3.54	Very Prepared
17. I immediately report observed structural hazards or unsafe conditions in the school for appropriate action.	3.53	Very Prepared
18. I participate in school activities that promote the maintenance and safety of school buildings and facilities.	3.59	Very Prepared
19. I observe and follow the school's earthquake preparedness policies and emergency procedures.	3.34	Very Prepared
20. Functional fire extinguishers are available and accessible in my classroom or nearby school facilities.	3.39	Very Prepared
21. Cabinets and storage units in my classroom are equipped with safety latches or locks.	3.39	Very Prepared
22. Bookshelves, cabinets, and other tall furniture in my classroom are securely anchored to the walls.	3.46	Very Prepared
23. Movable classroom equipment, such as computers, televisions, projectors, and other instructional materials, is properly secured to prevent injuries and damage during an earthquake.	3.44	Very Prepared
Grand Mean	**3.44**	**Very Prepared**

Table 2 presents the level of earthquake preparedness of public elementary school teachers in the Municipality of Quirino, Isabela. The overall grand mean of 3.44, interpreted as Very Prepared, indicates a high level of perceived preparedness among the respondents.

Participation in activities promoting the maintenance and safety of school buildings and facilities obtained the highest mean (3.59), followed by the availability of emergency sanitation and hygiene supplies (3.54), potable water for emergency use (3.53), and the immediate reporting of structural hazards in the school for appropriate action (3.53). These findings suggest that school safety initiatives and essential emergency resources are among the stronger aspects of preparedness.

In contrast, the availability of basic emergency tools and equipment for minor repairs received the lowest mean (3.24), interpreted as Prepared. This indicates a potential area for improvement, particularly in ensuring that schools have adequate tools to support immediate response and minor repairs following an earthquake. Overall, although teachers perceived their schools as very prepared, strengthening emergency equipment provision and maintaining essential supplies remain important for improving school disaster resilience.

The findings are consistent with Dayanghirang and Baguio (2025), who reported a high overall level of disaster preparedness among public school teachers in Manay District, Davao Oriental. Their study also highlighted opportunities to improve participation in disaster awareness campaigns despite teachers' recognition of their responsibilities in promoting safety.

C. Differences in the Level of Earthquake Preparedness in Terms of Profile

Table 3. Difference in the Level of Earthquake Preparedness when Respondents are grouped according to sex

Variable	Group Means		t-value	p-value
	Male	Female		
Level of Earthquake Preparedness	3.59	3.41	1.40	0.17

Table 3 presents the difference in the level of earthquake preparedness of the respondents when they are grouped according to sex.

As gleaned from the table, male respondents demonstrate a higher level of earthquake preparedness than the female respondents. However, the t-value of 1.40 and the p-value greater than 0.05 imply that the observed difference between male and female respondents are not significant. Thus, there is insufficient statistical evidence to conclude that male and female teachers differ significantly in their reported level of earthquake preparedness.

Similarly, Sonmez (2023) investigated disaster preparedness beliefs among 19,723 teachers who participated in Turkey's School-Based Disaster Education–Teacher Training Program. The findings revealed that teachers' overall disaster preparedness beliefs did not differ significantly according to gender, which implies that male and female teachers demonstrated comparable levels of preparedness beliefs.

Table 4. Difference in the Level of Earthquake Preparedness when Respondents are grouped according to Educational Attainment

Variable	Group Means				F-value	p-value
	Bachelor's degree	With Master's Units	Master's Degree	With Doctoral Units		
Level of Earthquake Preparedness	3.02	3.45	3.55	3.28	2.50	0.07

Table 4 presents the differences in earthquake preparedness among public elementary school teachers in Quirino, Isabela, when grouped according to educational attainment. Descriptively, teachers who had completed a master's degree exhibited higher preparedness levels, whereas those with a bachelor's degree had the lowest. However, the differences were not statistically significant, as indicated by a p-value greater than the 0.05 significance level. This suggests that the observed variations in preparedness across educational attainment groups were insufficient to establish a statistically significant difference.

Similarly, Polinar and Gonzaga (2023) examined disaster risk reduction awareness and involvement among 85 public school teachers in District 10, Schools Division of Baybay City,

Philippines. Their findings indicated high levels of disaster awareness and involvement, with no statistically significant differences across selected demographic characteristics, including civil status. Although the studies examined different grouping variables, both findings suggest that favorable disaster preparedness outcomes may be observed across teacher groups without statistically significant demographic differences.

Table 5. Difference in the Level of Earthquake Preparedness when Respondents are grouped according to Years of Teaching

Variable	Group Means					F-value	p-value
	(a) 1-5 years	(b) 6-10 years	(c) 11-15 years	(d) 16-20 years	(e) >20 years		
Level of Earthquake Preparedness	3.31	3.38	3.20^{de}	3.66^{c}	3.63^{c}	3.77	0.01

Means with different superscript letters are significantly different.

Table 5 presents the differences in earthquake preparedness among public elementary school teachers in Quirino, Isabela, when grouped according to years of teaching experience. Teachers with 16 years of service or more exhibited higher preparedness levels, whereas those with 11–15 years of experience obtained the lowest. The differences were statistically significant, as indicated by a p-value below the 0.05 significance level, suggesting that earthquake preparedness varied significantly across teaching experience groups. These findings imply that longer teaching experience may be associated with higher earthquake preparedness, potentially reflecting accumulated professional experience and greater familiarity with school safety procedures.

In contrast, Bumanglag et al. (2018) found that earthquake preparedness among employees of De La Salle Health Sciences Institute did not differ significantly according to length of service, sex, or educational attainment. This suggests that earthquake preparedness may not necessarily vary across these demographic characteristics.

CONCLUSION AND FUTURE WORKS

The study concludes that public elementary school teachers in Quirino, Isabela, demonstrated a very high level of earthquake preparedness. While preparedness did not differ significantly according to sex and educational attainment, significant differences were observed across teaching experience groups. The findings served as the basis for developing a **Disaster Risk Preparedness Program** focused on strengthening emergency equipment availability, enhancing earthquake response competencies, and providing targeted training for teachers, particularly those with fewer years of service. Future studies may evaluate the program's effectiveness in improving teachers' preparedness and actual emergency response performance.

Proposed Disaster Risk Preparedness Program

Area of Concern	Proposed Activities	Expected Output	Time Frame
Availability of emergency tools and equipment	Conduct an inventory of emergency supplies and provide essential tools for immediate response and minor repairs.	Adequate and accessible emergency equipment	First quarter
Earthquake response competencies	Conduct earthquake drills, evacuation simulations, and emergency response training.	Improved teacher response skills and evacuation readiness	Every six months
Preparedness of early-career teachers	Provide orientation, mentoring, and hands-on training on school earthquake safety procedures.	Increased preparedness among less-experienced teachers	First and second quarters
School safety and hazard reporting	Conduct regular inspections and establish a systematic procedure for reporting structural hazards.	Timely identification and reporting of school hazards	Quarterly
Emergency sanitation and water supplies	Inspect, replenish, and maintain emergency drinking water, hygiene supplies, and sanitation materials.	Sufficient and maintained emergency supplies	Quarterly
Program monitoring and evaluation	Administer preparedness assessments and evaluate performance during earthquake drills.	Evaluation report and recommendations for program improvement	Every six months

CONFLICT OF INTEREST

The author declares no conflict of interest related to the conduct of this study, its analysis, or the publication of its findings.

DECLARATION OF AI USE

The author declares the use of ChatGPT and Grammarly solely for grammar checking and language improvement. These tools were not used to generate research data, conduct data analysis, or interpret the findings. The author takes full responsibility for the accuracy, integrity, and final content of the manuscript.

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