

# Awareness of Parents of Surigao City National High School (SCNHS) Students on Earthquake Preparedness: Basis for the Formulation of School-Community Preparedness Plan

Ronald Allan A. Arcayera, PhD

Surigao City National High School  
Department of Education-Surigao City Division, Surigao City, Philippines

---

**Abstract:** This study determined the awareness of parents in terms of earthquake preparedness. It made use of the mixed method where both quantitative and qualitative techniques were combined. Primary data were gathered with the aid of a questionnaire as stipulated in the Department of Education (DepEd) Order No. 27 s. 2015 which each student conducted interview with his/her parents. Out of the 2,643 population, 347 both Junior and Senior High students became the respondents. From the results, majority of parents were aware of the basic understanding on pre, during, and post-earthquake preparedness. Parents received in different forms the education and awareness during disaster occurrence like knowing the emergency numbers of local agencies, understanding the evacuation plan and center, executing the Duck-Cover-Hold strategy, avoiding heavy equipment/things, and using the first-aid kits; however, there were some who weren't knowledgeable about the measures as evident on their responses. In light of the results, the Barangay Disaster Risk Reduction Council members should be properly trained regarding disaster management to understand its framework so that they can use it as a tool to manage disasters at school and community. Activities like disaster awareness and disaster risk reduction, mock drills, first-aid training, training on fire-safety and other response skills (*e.g. light search and rescue, swimming, evacuation, and emergency shelter*) should be further enhanced and developed. With the findings, it is therefore recommended that the barangay and school should intensify the earthquake preparedness plan to develop a well-informed and resilient environment. The Barangay Disaster Risk Reduction Council should also adopt the NDRRMC and Hyogo-Frameworks on disaster preparedness plans. Vulnerability assessment should also be developed to serve as the starting point in identifying the place as vulnerable to disasters or not. This relates to the need for decision making structure and planned strategies of the barangay and school to properly inform well the community like having the special training courses either literacy or cooperative trainings and developing a public warning information that will help provide a useful supplement to the over-all educational process of disaster education.

**Keywords:** Earthquake Preparedness, Plan, NDRRMC.

---

## I. INTRODUCTION

Philippines is considered one of the most disaster-prone countries in the world. The country's exposure to disasters is a significant extent due to its geographical location and physical characteristics. It lies along the Western Pacific Basin (a generator of climatic conditions such as monsoons, thunderstorms, inter-tropical convergence zone (ITCZ), typhoons, among others) making it a path of an average of 20 tropical cyclones annually, nine of which makes a landfall. Climate risk includes exposure to super typhoons, and other extreme weather, El Niño-related droughts, projected rainfall change and projected temperature increase.

Further, the risk to human life from natural disasters in the Philippines has increased dramatically over the past generation. From 1971 to 2015, natural disasters killed about 34,000 people in the country, but from 1990 to 2010, natural disasters killed or disrupted the lives of 35 million people. It is expected that climate change will exacerbate existing stresses in the country (The Philippines Initial National Communication, 1999).

Recent studies in the Philippines showed that water resources, natural ecosystems and local communities are vulnerable to climate change (Lasco, et al. 2008; Villamor & Boquiren 2008; Perez 2002). Also, natural hazards are part and parcel of the Philippine environment, but disasters happen because human settlements, infrastructure, people and their economic activities are placed where hazards happen. Costs of disaster impacts are borne by government, communities, and individual households, thus threatening socio-economic development gains. Thus, consideration of natural hazards and related risks in institutional programming and policies may be critical in securing sustainable development in the longer term and ensuring the effectiveness of organization's individual country strategies (Benson & Twigg, 2007).

In addition, Martin (2010) said that the Philippines is situated along a highly seismic area lying along the Pacific Ring of Fire and is highly prone to earthquakes. According to the Philippine Institute on Volcanology and Seismology (PHIVOCS), the country experiences an average of five (5) earthquakes a day. Earthquake disasters are not as frequent as the typhoons and flooding that take place in the country. Nevertheless, the impact generated on affected communities is usually massive and devastating. Earthquake-induced disasters were few in numbers and in terms of casualties.

Within the 10-year period, five (5) destructive earthquakes were recorded and human casualty included 15 deaths and 119 persons injured. Damage to the economy was estimated to reach P207 B. The 1990 Luzon Earthquake, the More Gulf Tsunami and the collapse of the Ruby Tower were the most notably devastating earthquake disasters in the Philippines. It is also prone to volcanic eruption situated along the Pacific Ring of Fire where two major tectonic plates (Philippine Sea and Eurasian) meet. This explains the occurrence of earthquakes and tsunamis and the existence of around 300 volcanoes of which 22 are active.

In Surigao City, the 2017 quake which hit last February 10, 2017 was a serious and traumatic experience to all Surigaonons considering the 332 aftershocks and strong foreshocks. According to the Department of Social Welfare and Development (DSWD), at least 300 houses in Surigao del Norte were damaged following the earthquake. Seven bridges collapsed, isolating San Francisco. At least eleven towns were also affected, experiencing power outages. Some buildings and schools collapsed and were partially damaged like Surigao State College and Technology (SSCCT), Anao-aon National High School (ANHS), Surigao del Norte National High School (SNNHS), and many others. Buildings on some public schools were damaged, thus, labelled as "*condemned*" due to its impact. The Provincial Disaster Risk Reduction and Management Council (PDRRMC) of Surigao del Norte projected that the cost of damage to property and infrastructure was at least ₱665 million (CNN Philippines, 2017).

In the consolidated Rapid Assessment Damage Report submitted in 2017 by the Project Development Officer II of Surigao City Division, it was found out that there were schools greatly affected by the impact of the quake. There were 50 buildings which were unfit to use for the students. There were no great human casualties; however, trauma caused children and teachers not go to school due to its effects and aftershocks. It was impossible to conduct classes that time due to constant shaking, however, different psychological debriefings were conducted by the school to ease the pain like zumba, drawing, film showing, and many more. In Surigao City National High School where this study was implemented, 6 buildings were "*condemned*", however, ongoing construction of buildings at present caused a great fear to the students and teachers if such quake happens to hit again. Further, in the Rapid Disaster Assessment Report (RADAR) submitted by the School Disaster Risk Reduction Management (SDRRM) Coordinator in 2017, there were 10 families severely affected by the 6.9 magnitude quake last February 9. Thus, this study attempted to understand the awareness of parents as interviewed by the their children and how preparedness was taken into action through DepEd Order No. 44, Series 2015 in any unexpected occurrence like earthquake.

With this, this study was conducted to further strengthen or promote the earthquake preparedness especially that children are the most vulnerable people in the community, thus, parents and teachers are required to have the widest knowledge dissemination in terms of its responses and preparedness before, during, and after a quake happens.

## II. REVIEW OF RELATED LITERATURE

Preparedness is the knowledge and capacities developed by the government, professional response, and recovery organizations, communities, and individuals to effectively respond to, and recover from – the impacts of likely, imminent or current hazard events or conditions. The action is carried out within the context of disaster risk reduction and

management and aims to build the capacities needed to efficiently manage all types of emergencies and achieve orderly transitions from response to sustained recovery. Preparedness is based on a sound analysis of disaster risk, and good linkages with early warning systems, and includes such activities as contingency planning, stockpiling of equipment and supplies, and development of arrangements for coordination, evacuation and public information, and associated training and field exercises.

At present, the country now is preparing for the coming of “The Big One”, a magnitude 7.2 earthquake from the West Valley Fault which is expected to hit Metro Manila and Quezon City (Sabornido, 2015). Thus, since then, the Office of Civil Defense (OCD), in coordination with the other agencies, has been conducting series of earthquake drills in preparing this kind of incident. Such action is to prepare the people even in schools for the impacts of the earthquake which could damage 40% of the residential and 35% public buildings, 34,000 casualties, 114,000 injured and 18,000 deaths would possibly follow. Further, with drills and awareness, the OCD and other organizations hoped and prayed that previous earthquake effects wouldn’t repeat just like the 10 strongest earthquakes in the Philippines that caused major destructions and casualties were the following:

**1. Magnitude 7.5 earthquake in Luzon (November 30, 1645).** The magnitude 7.5 earthquake that crushed Luzon on November 30, 1645 at about 8:00 pm was called the “most terrible earthquake” in Philippines’ history. The Epicenter of the said quake was in Nueva Ecija caused by the San Manuel and Gabaldon Faults. The extent of the tremor was felt as far as Cagayan Valley. It caused many landslides which buried many people alive and destroyed many buildings and churches including Manila Cathedral. That time, only Spanish are counted so the recorded number of casualties was only 600 while the injured was 3,000.

**2. Magnitude 7.3 earthquake in Casiguran (August 2, 1968).** Most of the people in Casiguran, Aurora were still fast asleep when a magnitude 7.3 earthquake struck at 4:19 a.m. of August 2, 1968. It was another deadly and shocking seismic activity in the country. And the City of Manila got the most severe damage. Many buildings were either damaged or destroyed totally. The said event was also called the Ruby Tower earthquake after the said six-story building located in Binondo collapsed, and caused the death of 260 people. A total of 268 people died that day and 261 more were injured.

**3. Magnitude 8.0 earthquake in Mindanao (August 17, 1976).** A magnitude 8.0 earthquake took place near Mindanao and Sulu a little past midnight of August 17, 1976 that was felt as far as Visayas. It was then followed by a massive 4 to 5 meters high tsunami covering 700 kilometers of coastline bordering the island. Because it was dark, the people were caught by the raging water which claimed 8,000 lives, injuring 10,000, and leaving 90,000 more, homeless.

**4. Magnitude 6.5 quake in Ilocos Norte (August 17, 1983).** The magnitude 6.5 quake in Ilocos Norte on August 17, 1983 happened around 8:18 p.m. and resulted to 16 casualties and 47 people got injured. It caused damages on various establishments such as schools, buildings, malls, residences, etc. There were also landslides and sand boils that followed the event.

**5. Magnitude 7.8 earthquake in Northern and Central Luzon (July 16, 1990).** A total of 2,412 people died and at least ₱10-billion worth of damages to public and private properties was reported after a magnitude 7.8 earthquake struck Northern and Central Luzon at around 4:00 p.m. of July 16, 1990. Hyatt Terraces Plaza, Nevada Hotel, Baguio Hilltop Hotel, Baguio Park Hotel, and FRB Hotel, all in Baguio collapsed trapping and burying people alive. Although the epicenter was recorded in Nueva Ecija, it caused more damage in the City of Pines which just lasted for about a minute and was recorded one of the tragedies in the country that would never be forgotten.

**6. Magnitude 7.1 earthquake in Mindoro (November 15, 1994).** November 15, 1994, at around 3:15 a.m., a magnitude 7.1 earthquake rocked Mindoro. A gigantic 8.5 meters (28 ft) tsunami then followed which devastated the islands of Baco and Calapan, Mindoro. A total of 7,566 houses were washed out and some 78 people died because of that tragedy.

**7. Magnitude 7.5 earthquake in Central and Southern Mindanao (March 5, 2002).** A magnitude 7.5 earthquake resulted to the death of 15 people and injuring around a hundred more in Central and Southern Mindanao on March 5, 2002. The said quake originated near the Cotabato Trench that was followed by a tsunami. But it was the flood that was generated by landslides and falling debris that caused damage to an estimated 800 buildings.

**8. Magnitude 6.9 earthquake in Central Visayas (February 6, 2012).** A total of 51 people died, 62 still missing and 112 were injured when a 6.9 earthquake Central Visayas, particularly Negros and parts of Mindanao on February 6, 2012.

It caused a landslide which buried a barangay, damaged 15,483 houses, and a total damage of ₱383-million on infrastructures and buildings was recorded.

**9. Magnitude 7.6 earthquake happened near Guiuan, Eastern Samar (August 31, 2012).** A very strong earthquake with a magnitude of 7.6 happened near Guiuan, Eastern Samar on August 31, 2012 was felt as far as Mindanao. The Philippine Institute of Volcanology and Seismology (PHIVOLCS) issued a tsunami warning Level 3, but it was lifted 5 hours later. The quake caused damage on homes, bridges, and other infrastructures. There were also power interruptions in the affected areas. But despite the intensity only one person was reported dead and one injured because of the landslide in Cagayan de Oro City.

**10. Magnitude 7.2 earthquake in Bohol (October 15, 2013).** People panicked in the morning of October 15, 2013. It was around 8:12 a.m. when a strong earthquake was felt here in Tacloban City. Only to find out after the lights came back that which were experienced was nothing compared to the damage it caused in Bohol which was the epicenter of the magnitude 7.2 earthquake. The quake affected most of Central Visayas, particularly Bohol and Cebu. It was felt in the whole area of Visayas and reached as far as Masbate Island in the north and Cotabato in Southern Mindanao. According to the National Disaster Risk Reduction and Management Council (NDRRMC), a total of 222 people died, 8 went missing and 976 others were injured. An estimated 73,000 structures were damaged wherein more than 14,500 of which were destroyed totally.

According to United Nation International Standards on Disaster Risk (UN ISDR) (2007), disasters are unpredictable especially earthquakes and when natural hazards strikes in school, children are among the most vulnerable population groups to be affected. Furthermore, during disasters, school buildings are destroyed taking away the precious lives of children and teachers and stalling access to education in the aftermath of disasters. Further, the bad thing about an earthquake is that people cannot prevent and predict it (Sabornido, 2015). People do not know when exactly it would happen. Because of that, it would be better to be prepared at all times through participating in earthquake drills conducted by authorities, keeping an emergency kit in the house, being ready when it happens and most importantly, being prayerful.

Further, the adoption of the DRRM Manual by the Department of Education (DepED) and the role of the DepED in the Philippine Disaster Management System, Executive Order No. 159, series of 1968 became essential mandating all heads of departments, bureaus, offices, agencies, instrumentalities and political sub-divisions of the government, including all corporations owned and controlled by the government, the armed forces, government hospitals and public educational institutions to establish their respective disaster control organizations. On the other hand, the Presidential Decree No. 1566 of June 1978, "*Strengthening the Philippine Disaster Control, Capability and Establishing the National Program on Community Disaster Preparedness*" stressed on the hardships endured by people due to a hostile environment continually seeking for survival against hazards, both natural and human-made. Furthermore, the Decree urged the public on the need to direct, to control and to coordinate the manpower, material, monetary, and spiritual resources of the entire Filipino nation to reduce the impact of hazards. On the other hand, the Rule 1040 of the Occupational Safety and Health Standards (OHSP) stressed that each agency must provide disaster control groups/health safety committees in every place of employment and the conduct of periodic drills and exercises in work places.

According to the Department of Education Disaster Risk Reduction Manual (2008), the following activities could be helpful to prepare for an earthquake.

- a) Perform the **DROP, COVER, AND HOLD ON**. This includes dropping (to prevent falling), making yourself as small a target as possible, and protecting your head, neck, and chest by taking cover under a sturdy desk or table or near an interior wall, covering your head with your hands and arms.
- b) When the shaking has stopped (or when the all clear bell rings), immediately and before you exit your room, take ten (10) seconds to look around, make a mental note of damage and dangers, check to see if any students are injured. If immediate, help can be given to those with injuries to stop serious bleeding. Ask responsible students to assist the lightly injured. Non-ambulatory injury should be reassured and wait for treatment where they are, unless it is more dangerous to remain.
- c) Use the **BUDDY SYSTEM**. Classes with teaching assistants should exit in pairs with one teacher in front and one in the back. Take a few seconds to check briefly with the teacher in the classroom to the left, to the right, and across the hall to see if they need assistance. In the absence of a teaching assistant, be prepared to take a class of a colleague while the

teacher assists with any injuries or in duties assigned to them. Escort your classes to their designated places.

- o Use the suggested routes or alternative routes if yours is blocked or unsafe.
  - o Everyone is to stay together and to quickly and quietly evacuate following the evacuation rules.
  - o Select two responsible monitors to lead, carefully checking that the evacuation route is clear. You bring up the rear, seeing that everyone is together.
  - o Check that exit routes are clear. Move directly away from the building when exiting. Students should cover their heads with their bag or book.
- d) Remind students on 4 rules for building evacuation! **DON'T TALK! DON'T PUSH! DON'T RUN!, DON'T TURN BACK!**
- e) Do the head count and fill out the *Classroom Status Report Form*. Check for injuries. If any students are injured, send them with two buddies to the First Aid station with instructions to return together immediately.
- f) Remind students about student-release procedures and their purpose to keep them safe.
- g) Teachers are to remain with their class at all times. Students must remain seated together as a class. Periodically call roll as needed. Keep students quiet so that they can hear information from the Incident Commander.

With this, people and other vulnerable groups should be fully informed on preparedness. Children likewise in schools need to be protected before disaster strikes. Protecting them during natural hazards requires two distinct yet inseparable priorities for action: disaster risk education and school safety to assess how prepared are they for any outbreak of disasters. Though natural and man-made disasters cannot be prevented, but at least communities and schools can plan through disaster management involving preparedness and mitigation measures (UNESCO, 2013).

According to Ozmen (2006), to prevent the huge destructions and to become a disaster resistant society, schools can play a pivotal role. For disaster preparedness to be achieved in school, Disaster Management Council is needed to promote the disaster management capacity building, training and education for students and teachers. According to Republic Act 10121, Rule 10, Section 1 which states that

*Disaster Risk Reduction Education must be integrated into the school curricula, including the National Service Training Program (NSTP) whether private or public, including formal and non-formal, technical-vocational, indigenous learning, and out-of-school youth courses and programs. Also, the school shall encourage community, specifically the youth, in the participation of disaster risk reduction and management activities, such as organizing quick response groups, particularly in identified disaster-prone areas, as well as the inclusion of disaster risk reduction and management programs as part of the SK programs and projects.*

Further, with Republic Act 10121, this study paved a way on school disaster preparedness and response. This is a significant step for Philippines and national agencies like the Department of Education to reduce the risks and impacts of disasters, especially in the context of climate change. The law clearly identified the rights and obligations of citizens and organizations in disaster preparedness and response. It also outlined the roles and responsibilities of the government and its various stakeholders in mitigating risks. In terms of Disaster Risk Reduction, it encouraged the participation of citizens, civil society, schools, community leaders and private sector in DRR policy making processes at all levels.

Because Philippines is always visited by disasters due to its geographical location, the government should also focus on capacity building of communities and all related organizations in disaster preparedness and response, and DRR must be integrated into policies and plans at all levels. Schools, through the help of administration and teachers, play an important role to this especially in disaster risk reduction. Teachers educate the community and students and often provide shelter/rehabilitation during a disaster. Before, during and after disasters, schools are mandated to provide education conveyed through integration of DRRM across subject areas and sharing of experiences, games, arts, role playing and the like. Further, the Hygo-Framework for Action: Priority 3 under the theme "Use knowledge, innovation, and education to build a culture of safety and resilience at all levels", stated that disasters can be substantially reduced if people are well informed and motivated towards a culture of disaster prevention and resilience.

Thus, this study aimed at understanding the earthquake preparedness among parents of students in Surigao City National High School and analyzed how these people of the community worked together to prepare themselves in whatever calamities that may happen. The study would contribute to the existing body of knowledge in terms of deeper understanding the concept of school and community-based disaster preparedness in the field of Disaster Risk Reduction Management. Further, such contribution would also help community parents decide and discuss disaster preparedness at home with their children. After such, results would help teachers and community parents increase their understanding on earthquake preparedness.

Additionally, this study was anchored also from the strategy recommended by the PHIVOLCS and experts on earthquake like executing the before, during and after activities during earthquake which are essential in ensuring safety and preparedness among people and vulnerable groups of the society.

To illustrate the schematic diagram of this study, the flow of the study was shown and presented which contained earthquake preparedness as one of the key components in Disaster Risk Reduction. This study aimed further to generate school and community preparedness plan which is necessary in increasing or promoting family earthquake preparedness among the community and parents of Surigao City National High School. The first box asked the preparedness before, during and after an earthquake. The second box contained the process used where data were collected through DepEd Order No. 27, s. 2015 while the third box contained the output of this research study which would present the school community preparedness plan.

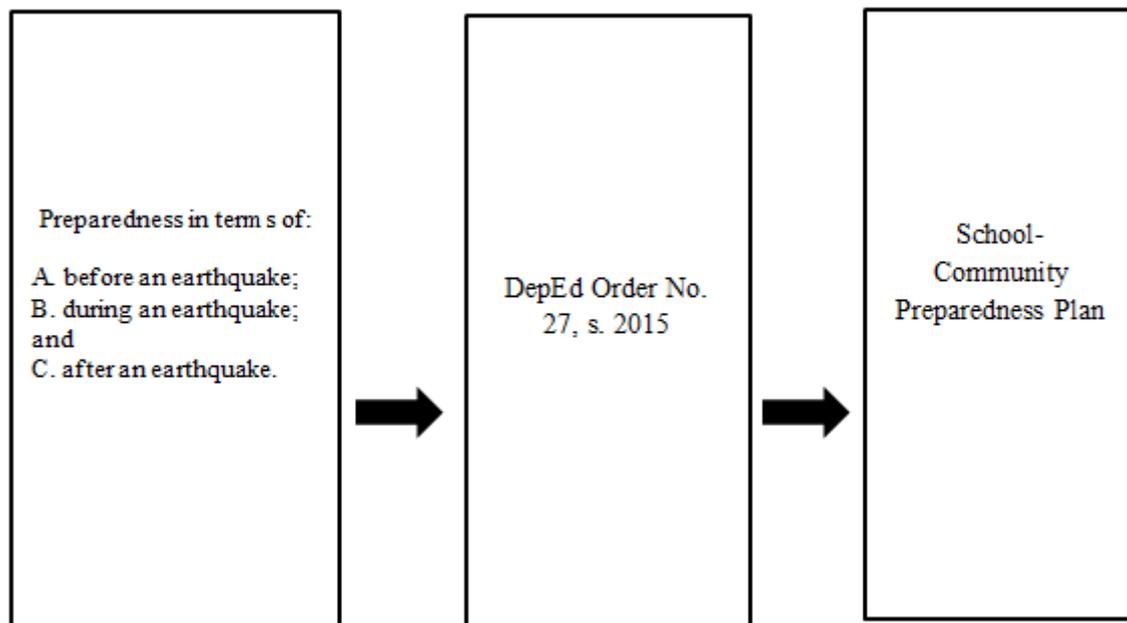


Figure 1. Schematic Diagram of the Study

### III. RESEARCH QUESTIONS

Over the past years, Surigao City National High School had gained a lot of attention and momentum in the area of disaster risk reduction. Numerous projects and activities had been undertaken by schools with the support of various stakeholders and agencies. However, challenges keep increasing and disasters, students' and communities' risks were still present. Thus, this study sought to understand the earthquake preparedness among families in school. The following were the problem statements:

1. What is the awareness of families about earthquake preparedness in terms of:
  - 1.1. before an earthquake;
  - 1.2. during an earthquake; and
  - 1.3. after an earthquake.
2. Based from the results, what plan can be proposed to promote family earthquake preparedness in school and in community?

#### IV. SCOPE AND LIMITATION OF THE STUDY

The study focused on the parents/guardians of the students enrolled in Surigao City National High School from S.Y. 2017-2018. The interpretations of the data were intended to increase the depth and breadth of information of the parents' responses based from interviews of the students as suggested in the Department Order No. 27, Series of 2015.

#### V. RESEARCH METHODOLOGY

This study made use of the mixed method where both quantitative and qualitative techniques were combined. Mixed method is defined as a procedure for collecting, for analyzing, and for mixing both quantitative and qualitative data at some stage of the research process within a single study to understand a research problem more completely (Cresswell, 2003). Data were gathered from the primary and secondary sources. Primary data were gathered with the aid of questionnaire as stipulated in the Department of Education (DepEd) Order No. 27 s. 2015 and each student conducted an interview to his/her parents. Literature review of relevant sources of information about the research problem and research questions were used as secondary data.

**Participants.** Using Slovin's formula, the study made use of the simple random sampling where 347 of the 2,643 both Junior and Senior High students as of June 16 conducted an interview with their parents or family based on the questionnaire given. The interviewees of this study were the parents of the students enrolled in Surigao City National High School for S.Y. 2017-2018.

**Data Gathering Method.** A letter of permission was submitted to the school principal on the conduct of the study. Upon its approval, the distribution of the questionnaire followed. The School Disaster Risk Reduction Management Coordinator then informed the classroom advisers on the Family Earthquake Preparedness Questionnaire where select students were required to conduct an in-depth interview of their parents or family to obtain a rich descriptive data necessary in the knowledge and social reality of the study (Maree, 2010). The targeted respondents in this study completed the questionnaire by giving the necessary responses during the interview. According to Ormrod (2001), face-to-face interviews have the distinct advantage of enabling the researcher to establish rapport with potential participants and therefore gain their cooperation and such yield the highest response rates in survey research.

Further, students were informed through a letter from their advisers. The letter contained the confidentiality of the participants' answers that no one except researcher knew the information. The participants' full identities were not revealed but presented through codes. The results also of this research study were done through member checking to prevent misinterpretation of the facts included. To avoid plagiarism and academic fraud to this study, citations were also done.

**Data Analysis.** As to how the data were treated, Simple Frequency Count was employed since it looked at the before and post responses among parents in terms of their awareness on earthquake preparedness. Narrative descriptions were involved, thus, the research study made use of description as a tool to organize data into patterns or themes that emerged during analysis. In particular, the Summative Content Analysis was used which involved counting and comparisons of statements followed by the interpretation of the underlying context (Hsiu-Fang, et al, 2005).

**Instrument.** The questionnaire utilized in this study was adopted from the DepEd Order No. 27, s. 2015. It contained questions like preparedness before, during, and after an earthquake. All questions should be answered by *Yes or No* except for during preparedness where parents should write sentences on their actual preparations which were necessary in the analysis using the summary content analysis.

#### VI. DISCUSSION OF RESULTS

The main purpose of this study was to discuss the data collected through a questionnaire and interviews of the respondents to determine the extent to which the research addressed the main research question of this study. The collected data was discussed using Cresswell's methodology which used the mixed method starting from its quantitative to qualitative descriptions.

##### **Research Question 1 - On Family Earthquake Preparedness**

##### **1.1 Family Earthquake Preparedness before an Earthquake**

This part showed the preparedness among parents/guardians before an earthquake. Based from DepEd Order 27 Series of 2015, the guidelines on earthquake preparedness should support to DepEd Order No. 55 Series of 2007 entitled

Prioritizing the Mainstreaming of Disaster Risk Reduction and Management in the School System and Implementation of Programs and Projects) and DepEd Order No. 21 Series of 2015 entitled Disaster Risk Reduction and Management Coordination and Information Management Protocol seeking different education stakeholders to disaster preparedness and prevention. Thus, this research study analyzed the pre, during, and post-earthquake preparedness measures. The table below showed the analysis and results based on the first criterion which was referred as the set of measures taken by families or individuals before an earthquake hits to minimize the effects, injuries, and damages.

**Table 1. Family Earthquake Preparedness before an Earthquake**

Earthquake Preparedness	<i>f</i> (n=347) Indicators					
	BAGO ANG LINDOL	OO	%	HINDI	%	HINDI SIGURADO
Alam ba natin ang mga emergency numbers ng local na tanggapan ng pamatay-sunog, pulis, pagamutan, at mga kawani ng barangay?	63	18.16%	133	38.33%	151	43.52%
Alam ba natin ang pinakamalapit na ligtas na lugar mula sa ating bahay na maaarig paglikasa pagkatapos ng lindol?	217	62.53%	55	15.85%	75	21.61%
Alam ba ng buong pamilya ang earthquake evacuation plan sa kani-kanilang mga paaralan at trabaho?	195	56.20%	78	22.48%	74	21.33%
Alam ba natin kung paano ililikas ang mga bata, may kapansanan, at/o matatanda na kasama natin sa bahay?	198	57.06%	59	17.00%	90	25.94%
Alam ba ng buong pamilya ang nararapat na unang pagtugon sa tuwing may lindol (Duck, Cover, Hold)?	242	69.74%	61	17.58%	44	12.68%
Ang mga mabibigat bang bagay o kasangkapan na maaring makasakit ng tao ay hindi nakalagay sa matataas na lugar?	208	60.82%	87	25.07%	52	14.99%
Ang mga mabibigat bang kasangkapan sa tahanan ay nakakabit sa pader or sahig?	183	52.74%	109	31.41%	55	15.85%
Nag-iimbak ba tayo ng pagkain o inuming tubig para sa posibleng lindol?	187	53.89%	93	26.80%	67	19.31%
Alam ba ng buong pamilya kung ang ating tahanan ay malapit sa anumang katawang tubig, gaya ng lawa, dagat o ilog?	246	70.89%	68	19.60%	33	9.51%
Bilang maaring resulta ng lindol, alam ba ng buong pamilya kung tayo ay nasa panganib na dulot ng tsunami?	231	66.57%	64	18.44%	52	14.99%

The ten (10) questions on pre-earthquake preparedness showed varying responses. For the first question, *Alam ba natin ang mga emergency numbers ng local na tanggapan ng pamatay-sunog, pulis, pagamutan, at mga kawani ng barangay?*, the results showed that 151 (43.52%) respondents answered Oo, 133 (38.33%) answered Hindi, and 63 (18.16%) Hindi Sigurado.. Results showed that respondents were not sure of the hotline numbers such as Bureau of Fire and other agencies when disasters strike. Such was opposing to the suggested idea of NDRRMC to know hotline numbers in the locality since knowing these hotline or emergency numbers would make things more convenient and safe in terms of crisis management or even lessening the incidents of being passed on to different departments or even decreasing waiting time.

The second question, *Alam ba natin ang pinakamalapit na ligtas na lugar mula sa ating bahay na maaaring paglikasa pagkatapos ng lindol?*, the results showed that 217 (62.53%) respondents answered Oo, 55 (15.85%) Hindi, and 75 (21.61%) answered Hindi Sigurado. Results showed that based from the interview of these students, they knew the safest place where they could go if an earthquake occurs. This meant that parents were aware on their reunification plans if separated or not when an earthquake happens.

The third question, *Alam ba ng buong pamilya ang earthquake evacuation plan sa kani-kanilang mga paaralan at trabaho?*, the results showed that 195 (56.20%) answered Oo, 78 (22.48%) answered Hindi, and 74 (21.33%) Hindi Sigurado. Results showed that respondents knew their evacuation plan in school or even at their work. This showed that these respondents were fully aware of their procedures for evacuation, their reunification or even going to emergency areas. Considering viewpoints, these parents supported the recommendations of the NDRRMC or even local scenarios which people should know where to go possibly to decrease the number or risks of injury or even property damage when an earthquake hits. People should always be calm and handle cases responsibly.

The fourth question, *Alam ba natin kung paano ililikas ang mga bata, may kapansanan, at/o matatanda na kasama natin sa bahay?*, the results showed that 198 (57.08%) respondents answered Oo, 59 (17.00%) answered Hindi, and 90 (25.94%) checked Hindi Sigurado. Results showed that parents/guardians knew where to go possibly when an earthquake strikes. Further, this implies that parents had established already in their family a clear set of guidelines particularly on what to do and where to go for their safety and security.

The fifth question, *Alam ba ng buong pamilya ang nararapat na unang pagtugon sa tuwing may lindol (Duck, Cover, Hold)?*, the results showed that 242 (69.74%) answered Oo, 61 (17.58%) answered Hindi, and 44 (12.68%) answered Hindi Sigurado. Results showed that these parents knew the best strategy when an earthquake hits like the Duck, Cover and Hold. According to NDRRMC, it is very important that one has prepared himself/herself ahead since earthquake occurs without any warning, thus, strategy like the Duck, Cover and Hold, will reduce the chance of injury or death. Further, when Doing Duck, it is suggested to duck where you are and drop your knees. This position protects one from being knocked down and allows one to stay low and crawl. The Cover is a position where one has to cover head and neck to protect parts of the body. When doing this, one remains calm, crawl and stay to safe areas to be protected. Hold is to hold on until shaking stop where one shifts from crawling to moving. Running is not answer when an earthquake hits. Instead, do the duck, cover and hold to be protected.

The sixth question, *Ang mga mabibigat bang bagay o kasangkapan na maring makasakit ng tao ay hindi nakalagay sa matataas na lugar?*, the results showed that 208 (60.82%) answered Oo, 87 (25.07%) answered Hindi, and 52 (14.99%) Hindi Sigurado. Results showed and implied that these parents thought intelligently of the possible hazards that these things would bring if placed to higher or elevated places. According to NDRRMC, it is best to stay away from glasses or windows or anything that could fall when an earthquake strikes.

The seventh question, *Ang mga mabibigat bang kasangkapan sa tahanan ay nakakabit sa pader or sahig?*, the result showed that 183 (52.74%) respondents answered Oo, 109 (31.41%) answered Hindi, and 55 (15.85%) answered Hindi Sigurado. Results showed that parents knew where to place things orderly to prevent danger when an earthquake hits.

The eight question, *Nag-iimbak ba tayo ng pagkain o inuming tubig para sa posibleng lindol?*, the results showed that 67 (19.32%) answered Oo, 93 (26.80%) answered Hindi, and 187 said Hindi Sigurado. This result showed that most parents were unprepared when an earthquake hits the place. This may be due to the fact that earthquake occurs unexpectedly, thus, things like this, would also require unexpected scenarios.

The ninth question, *Alam ba ng buong pamilya kung ang ating tahanan ay malapit sa anumang katawang tubig, gaya ng lawa, dagat o ilog?*, the results showed that 246 (70.90%) answered Oo, 68 (19.60%) answered Hindi, and 33 (9.51%) answered Hindi Sigurado. This result showed that parents knew their geographical location, where their houses were situated, and what would they do if emergency strikes unexpectedly. The Association of Structural Engineers of the Philippines (ASEP) recommended that every family should know the condition of their house to see its structural integrity, ductility, and credibility of the building when an earthquake strikes. Further, the organization recommended to check house and its location and follow, *How Safe is My House?*, in ensuring the safety of the house during an earthquake.

The tenth question, *Bilang maaring resulta ng lindol, alam bang buong pamilya kung tayo ay nasa panganib na dulot ng tsunami?*, the results showed that 231 (6.57%) answered Oo, 64 (18.44%) answered Hindi, and 52 (14.99%) answered Hindi Sigurado. Results showed that most of the parents were aware on where to go if there were impending signs of tsunami.

Thus, from the results, it could be gleaned that a great percentage of responses from Hindi and Hindi Sigurado responses were evident which called for an immediate response in support to NDRRMC's call and provisions of zero casualty, safer and resilient community through *adopting a disaster risk reduction, and management approach that is holistic, comprehensive, integrated, and proactive in lessening the socioeconomic, and environmental impacts of disasters including climate change, and promote the involvement and participation of all sectors and stakeholders concerned, at all levels especially the local community.* With this, this research study proposed a community preparedness plan in scaling resilience and in increasing awareness among people in the local community.

## 1.2. Family Earthquake Preparedness during an Earthquake

Preparedness during an earthquake is vital for survival in the event of actual earthquake. Common survival technique during an earthquake is to practice Duck, Cover, and Hold which is useful for survival. Thus, this research study revealed multiple responses on how respondents prepared during an earthquake. Using summative content analysis, responses were counted, compared, and summarized to get the common transcripts and its meaning.

**Table 2. Family Earthquake Preparedness during an Earthquake**

	Transcripts	Lexicon Count	Memos
Kung ang lindol ay nangyari habang tayo ay naglalakbay, ano ang nararapat na unang tugon para dito?	<i>Lumayo sa anumang posibleng gumuho tulad ng mga puno, buildings, o poste. Yuyuko at kumalma.</i>	12	This preparedness measure showed that avoiding falling debris and other heavy objects would minimize the effects of the danger and risks an earthquake can cause to humans. People must avoid and be vigilant to dangers and risks that an objects can cause.
Kung ang lindol ay nangyari habang tayo ay nasa bahay, ano ang ating magiging unang tugon para dito?	<i>Gawin ang Duck-Cover-Hold at dahan-dahang lumabas. Kumalma at magtago sa ilalim ng mesa.</i>	15	The strategy is an effective way for survival. Running is not an answer. Instead, one should relax and do the necessary tips like dropping, covering, and holding.
Kung ang lindol ay nangyari habang tayo ay nasa bahay, paano natin gagawin ang paglikas?	<i>Magtago sa ilalim ng mesa. Tumakbo sa labas at humanap ng ligtas na lugar.</i>	14	Thinking of the safest and quickest way is necessary when shaking starts and stops. Finding also the emergency exits or routes would help you safe and secured.
Kung ang lindol ay nangyari habang tayo ay naglalakbay, saan magkikita-kita an gating pamilya pagkatapos tumigil ng pagyanig?	<i>Sa malapit na evacuation center.</i>	5	Knowing and understanding evacuation center or areas is still must. Knowing where to go and be accommodated by agencies which could give you help or remedy would lessen the impact of the earthquake.
Kung mayroong nasaktan sa ating pamilya o kasama sa bahay, ano ang nararapat na unang tugon para dito?	<i>Magpagamot kaagad sa malapit na ospital or kunin ang first-aid kit.</i>	11	Training on basic life support or aid is necessary to help one who is affected by an earthquake. When one is involved in first-aid training or there is an available kits or medicine would help relieve someone affected.
Kung tayo ay nakulong sa loob ng bahay, ano ang dapat gawin?	<i>Maghintay ng rescue. Tawagan ang pamilya or magtungo sa mesa.</i>	10	Knowing hotline numbers or emergency contact would minimize the waiting time for rescue.
Kung ang itinalagang evacuation area ay nasira	<i>Sa gym, eskwelahan, barangay hall o paliparan</i>	7	Finding the safest place is a must. One must see to it that everybody is secured

ng lindol, saan ang ibang lugar na maari nating paglikasan?	or sa <i>area na hindi nasalanta</i>		and safe. Keep your eyes open and be hopeful.
Kung mawala ang linya ng komunikasyon, gaano katagal maghihintayan ang pamilya sa napag-usapang lugar nng pagkikita?	<i>Depende sa pangyayari.</i>	3	Reunification plan should always be observed in the family. A family should set a clear guidelines on where to meet in cases of emergency.

To understand the qualitative data collected in this study, a descriptive analysis was used which narrated the responses of the parents. Face-to-face interviews were used by the students where the interviewer had an opportunity to ask their parents series of questions.

As stated above in Chapter 1, the aim of this qualitative interview was to provide a rich descriptive data that would help the researcher understand the participants' construction of knowledge and social reality. This paragraph showed the summary of parents' responses based from the interviews of the students on actual earthquake preparations. For the first question, *Kung ang lindol ay nangyari habang tayo ay naglalakbay, ano ang nararapat na unang tugon para dito?*, respondents said "Lumayo sa anumang posibleng gumuho tulad ng mga puno, buildings, o poste. Yuyuko at kumalma." Responses showed a similar idea which NDRRMC and other organizations believed in that the basic theme behind earthquake preparedness is to keep calm and be vigilant to falling debris. Also, when an earthquake happens at home, it is best avoid items which could minimize the impact of it. It is also recommended that individuals at home should secure firmly large furniture or screens to reduce the chance of objects falling.

The second question, *Kung ang lindol ay nangyari habang tayo ay nasa bahay, ano ang ating magiging unang tugon para dito?*, respondents answered "Gawin ang Duck-Cover-Hold at dahan-dahang lumabas. Kumalma at magtago sa ilalim ng mesa." Responses showed that doing the duck-cover, and hold strategy is an effective way for survival. Given the danger posed by any objects or whatever debris, it is still best to execute the drop, cover, and hold to protect yourself from dangers.

The third question, *Kung ang lindol ay nangyari habang tayo ay nasa bahay, paano natin gagawin ang paglikas?*, respondents said "Magtago sa ilalim ng mesa. Tumakbo sa labas at humanap ng ligtas na lugar." Responses showed that any individual at home must familiarize the easiest exit or evacuation route to take. By bracing in a doorway or by getting under a sturdy desk or table would minimize the impact of an earthquake.

The fourth question, *kung ang lindol ay nangyari habang tayo ay naglalakbay, saan magkikita-kita an gating pamilya pagkatapos tumigil ng pagyanig?*, respondents said "Sa malapit na evacuation center." This showed a similar idea to the third response which individuals must know where to go and reunite in case of separate destinations.

The fifth question, *kung mayroong nasaktan sa ating pamilya o kasama sa bahay, ano ang nararapat na unang tugon para dito?*, respondents answered "Magpagamot kaagad sa malapit na ospital or kunin ang first-aid kit." The responses revealed that basic life support training or even knowing how to use first aid kits is essential to reducing dangers. Kits should always be accessible, conveniently located, and prominently marked in familiar places for possible evacuation. However, survival kits should also be considered by individuals like having radio, flashlight, potable water, candies, and ready to eat food in case an actual disaster happens.

The sixth question, *kung tayo ay nakulong sa loob ng bahay, ano ang dapat gawin?*, respondents said "Maghintay ng rescue. Tawagan ang pamilya or magtungo sa mesa". These responses revealed that contingency planning is still a must. Individuals should know rescue numbers or even hotline numbers to inform complicated situations.

The seventh question, *Kung ang itinalagang evacuation area ay nasira ng lindol, saan ang ibang lugar na maari nating paglikasan?*, the respondents said "Sa gym, eskwelahan, barangay hall o paliparan." These responses revealed a similar idea to the third and fourth responses which individuals must know where to go and reunite in case of separate destinations or even knowing the safest and secured place like an open and comfortable area.

The eighth question, *Kung mawala ang linya ng komunikasyon, gaano katagal maghihintayan ang pamilya sa napag-usapang lugar nng pagkikita?*, respondents answered "Depende sa pangyayari." Reunification is still a must. Individuals should know where to go for possible disasters.

### 1.3. Family Earthquake Preparedness after an Earthquake

After the immediate threat of an earthquake which has passed, preparedness still counts. This is an important criterion for survival which recommends individuals to be alert and active when going out by avoiding falling objects and other debris, knowing the evacuation plan, equipping self of possible disasters that may come like fire, and attending to psychological stress debriefing activities. Thus, this research study showed multiple responses in criteria required for post-earthquake preparedness.

**Table 3: Family Earthquake Preparedness after an Earthquake**

PAGKATAPOS NG LINDOL AT UNANG PAGYANIG	<i>f</i> (n=347) Indicators					
	OO	%	HINDI	%	HINDI SIGURADO	%
Alam ba natin kung saan matatawagan ang mga kasama natin sa bahay?	255	73.49%	22	6.34%	70	20.17%
Alam ba natin kung kalian dapat lumikas?	224	64.70%	60	17.29%	63	18.16%
Alam ba nating delikado ang pagbalik sa ating tahanan matapos ang lindol dahil sa mga posibleng epekto ng mga susunod na pagyanig?	244	70.32%	31	8.93%	72	20.75%
Tayo ba ay handa para sa mga epekto ng mga susunod na pagyanig tulad ng sunog, tuluyang pagkasira ng bahay o gusali?	196	56.48%	75	21.61%	76	21.90%
Ang atin bang tahanan ay ligtas mula sa mga maaaring pagmulan ng sunog matapos ang lindol?	121	43.52%	109	31.41%	117	33.72%
Kung tayo ay nasa panganib na dulot ng tsunami, alam ba natin ang tamang paraan ng paglikas?	200	57.64%	44	12.68%	103	29.69%
Alam ba natin kung paano mapatatagal ang pagkain matapos ang lindol?	186	53.60%	73	21.04%	88	25.36%
Alam ba natin kung kanino makakukuha ng tama at totoong balita o impormasyon upang hindi na tayo makadagdag sa maling mga haka-haka na siyang nagiging sanhi ng takot at kaba?	247	71.18%	40	11.53%	60	17.29%

The third (3) questions on post-earthquake preparedness showed common results. The first question, *Alam ba natin kung saan matatawagan ang mga kasama natin sa bahay?*, the results showed that 255 or 73.49% answered Oo, 22 or 6.34% (Hindi), and 70 or 20.17% (Hindi Sigurado). This result showed that most of the respondents knew contact numbers of their loved ones at home signifying that they stored them into their mobile phones the numbers for easy monitoring when a complicated situation calls.

The second question, *Alam ba natin kung kalian dapat lumikas?*, the results showed that 224 or 64.70% answered Oo, 60 or 17.29% (Hindi), 63 or 18.16% (Hindi Sigurado). This result showed that most of the respondents knew when to evacuate or move to safer place, implying, that there is greater awareness among these people on their place, the situation, and the effects of an earthquake.

The third question, *Alam ba nating delikado ang pagbalik sa ating tahanan matapos ang lindol dahil sa mga posibleng epekto ng mga susunod na pagyanig?*, the results showed that 244 or 70.32% answered Oo, 31 or 8.93% (Hindi), and 72 or 20.75% (Hindi Sigurado). This revealed that respondents knew when and where to go when emergency calls. This supported the view of the NDRRMC which every family should know the possible effects when an earthquake strikes like tsunami or even fire.

The fourth question, *Tayo ba ay handa para sa mga epekto ng mga susunod na pagyanig tulad ng sunog, tuluyang pagkasira ng bahay o gusali?*, the results showed that 244 or 70.32% answered Oo, 75 or 21.61% (Hindi), and 76 or 21.90% (Hindi Sigurado). This result revealed that respondents knew the occurrences of fire and tsunami after an

earthquake strikes a place, thus, one must be prepared for major and other disasters to come and practice how to protect by following the precautionary measures.

The fifth question, *Ang atin bang tahanan ay ligtas mula sa mga maaaring pagmulan ng sunog matapos ang lindol?*, results showed that 121 or 43.52% answered Oo, 109 or 31.41% (Hindi), and 117 or 33.72% (Hindi Sigurado). This result revealed that most of the participant knew that other disasters might come if an earthquake hits.

The sixth question, *Kung tayo ay nasa panganib na dulot ng tsunami, alam ba natin ang tamang paraan ng paglikas?*, results showed that 200 or 57.64% answered Oo, 44 or 12.68% (Hindi), and 103 or 29.69% (Hindi Sigurado). This revealed that respondents knew where to evacuate and go if tsunami or whatever disasters might come.

The seventh question, *Alam ba natin kung paano mapatatagal ang pagkain matapos ang lindol?*, results showed that 186 or 53.60% answered Oo, 73 or 21.04% (Hindi), and 88 or 25.36% (Hindi Sigurado). The results showed that respondents knew that in order to survive, storing food items would help ease the pain when there is an earthquake.

The eighth question, *Alam ba natin kung kanino makakuha ng tama at totoong balita o impormasyon upang hindi na tayo makadagdag sa maling mga haka-haka na siyang nagiging sanhi ng takot at kaba?*, result showed that 247 or 71.18% answered Oo, 40 or 11.53% (Hindi), and 60 or 17.29% (Hindi Sigurado). This result showed that respondents knew that through listening to reliable and accurate information, this would update them of possible aftershocks or foreshocks.

**Findings.** From the results, it could be gleaned that a great percentage of responses from *Hindi* and *Hindi Sigurado* responses were evident which called for an immediate response in support to NDRRMC's call and provisions of zero casualty, safer and resilient community through *adopting a disaster risk reduction, and management approach that is holistic, comprehensive, integrated, and proactive in lessening the socioeconomic, and environmental impacts of disasters including climate change, and promote the involvement and participation of all sectors and stakeholders concerned, at all levels especially the local community.*

With this, this research study proposed a community preparedness plan in scaling resilience and in increasing awareness among people in the local community. Further, the results revealed that a "Yes" or "Oo" was the common response to the before and after-earthquake preparedness questions while during earthquake preparedness yielded common responses. This simply meant that a great or maximum awareness is gleaned from the results which further imply that the community preparedness behavior is achieved fully to get ready for disasters which according to UNESCO (2010), disaster preparedness focuses on plans to respond to a disaster threat or occurrence. It takes into account an estimation of emergency needs, and identifies the resources to meet these needs and also highlights preparedness objectives. Thus, this research study proposed a community preparedness plan in answer to the great number of percentage of respondents with *Hindi* (No) and *Hindi Sigurado* (Not Sure) responses and to strengthen the earthquake preparedness among parents and entire community of Surigao City National High School.

**Conclusions.** The results of this study revealed that the community earthquake preparedness have been achieved by the parents of the students of Surigao City National High School based on the knowledge received from different forms during hazards and disaster education. Parents were simply aware of the actions to be done during earthquake like preparedness before, during, and after. The Barangay Disaster Risk Reduction Council members should be properly trained regarding disaster management to understand the disaster management framework so that they can use it as a tool to manage disasters at school. Activities like disaster awareness and disaster risk reduction, mock drills, first-aid training, training on fire-safety and other response skills (e.g. light search and rescue, swimming, evacuation, and emergency shelter) should be further enhanced and developed in the curriculum of the students. Further, schools should coordinate with the community to address the threats and dangers to the most vulnerable groups of the place. The education sector should also tap the community in the training and workshop in disaster management to empower them with knowledge and awareness.

## VII. RECOMMENDATIONS

With the findings above, it is therefore recommended that the school and community should intensify the implementation of earthquake preparedness plan where these people reside to develop a well-informed and resilient environment. The Barangay Disaster Risk Reduction Council should also adopt the NDRRMC and Hyogo-Frameworks on disaster

preparedness plans. Vulnerability assessment should also be developed to serve as the starting point in identifying the place as vulnerable to disasters or not. This relates to the need for decision making structure and planned strategies of the barangay to properly inform well the community like having the special training courses either literacy or cooperative trainings and developing a public warning information that will help provide a useful supplement to the over-all educational process of disaster education.

Based on the forms of education mentioned above, it is therefore recommended also that the Barangay Disaster Risk Reduction Council should encourage emergency drills and rehearsals to properly educate the community. Such rehearsal activities emphasize points in the training program and to test the system as a whole if effective or not which according to Twig (2004) that rehearsals, evacuation, and response procedures should be practiced, evaluated, and improved.

In consideration of the above results emanating from the parents of the students and reviewed literature, it is also recommended that the Barangay Council should involve children and adults in the disaster preparedness plan and education. It is therefore a significant step to include the most vulnerable groups of the community to help them survive the disaster safely. The knowledge, attitude, and skills learned by these people will develop their response strategies during a disaster which according to Twig (2004), the main of disaster preparedness is to help people to avoid impending disaster threats and to put plans, resources, and mechanisms in place to ensure that those who are affected receive adequate assistance. With this, a proposed school-community preparedness plan was offered to strengthen the earthquake preparedness among parents and teaching staff.

#### REFERENCES

- [1] Benson & Twig (2007). *Tools for Mainstreaming Disaster Risk Reduction*. Retrieved from [www.preventionweb.net/files/1066\\_toolsformainstreamingDRR.pdf](http://www.preventionweb.net/files/1066_toolsformainstreamingDRR.pdf)
- [2] Department of Education (2008) '*Disaster Risk Reduction Resource Manual: Safer School Resource Manual*' Philippines: DepEd, UNICEF and Plan Philippines.
- [3] Ozmen, Fatma (2006). *Level of Disaster Preparedness from the Aspect of School Principals*. [www.emeraldinsight.com/doi/abs/10.1108/09653560610669873](http://www.emeraldinsight.com/doi/abs/10.1108/09653560610669873)
- [4] Philippine Institute of Volcanology and Seismology. (2014). *How safe is my house? Self-check for Earthquake Safety of Concrete Hollow Block (CHB) Houses*. Philippines, Quezon City, Philippine Institute of Volcanology and Seismology, April 2014.
- [5] Philippine Institute of Volcanology and Seismology. (2009). *Earthquake: Are you prepared?* Quezon City, Philippine Institute of Volcanology and Seismology, June 2009 revised 2013.
- [6] Philippines Initial National Commission. (1999). *Vulnerability Risk Reduction Climate Change Knowledge Portal*. Retrieved from [webx.worldbank.org](http://webx.worldbank.org).
- [7] Sabornido, Lyza R. (2015) *Top 10 Strongest Earthquake to hit the Philippines*. Retrieved from <http://faq.ph/top-10-strongest-earthquakes-to-hit-the-philippines/>
- [8] UN ISDR. (2007). *Disaster Statistics*. <https://www.unisdr.org/we/inform/disaster-statistics>
- [9] Thomson & Martin (2010). *Global Security Safety & Sustainability*. Retrieved from <https://books.google.com.ph/books?isbn=3319510649>
- [10] Villegas MMM. (2012). *Earthquake Preparedness in School 'Disaster risk reduction and management manual for Science and Mathematics teachers' Department of Science and Technology Science Education Institute*. Reprinted 2012 pp 161-169.
- [11] [http://www.phivolcs.dost.gov.ph/index.php?option=com\\_phocadownload&view=file&id=74:house-safe-is-your-house&Itemid=44](http://www.phivolcs.dost.gov.ph/index.php?option=com_phocadownload&view=file&id=74:house-safe-is-your-house&Itemid=44) Accessed date: May 2015.
- [12] [http://www.phivolcs.dost.gov.ph/index.php?option=com\\_phocadownload&view=file&id=71:earthquake-are-you-prepared&Itemid=44](http://www.phivolcs.dost.gov.ph/index.php?option=com_phocadownload&view=file&id=71:earthquake-are-you-prepared&Itemid=44) Accessed date: May 2015.
- [13] [cnnphilippines.com/news/2017/03/06/Surigao-aftershock-casualties.html](http://cnnphilippines.com/news/2017/03/06/Surigao-aftershock-casualties.html)