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KNOWLEDGE, ATTITUDE, AND PRACTICES OF STUDENTS AND SCIENCE TEACHERS IN DISASTER PREPAREDNESS

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Abstract

In a public high school in Pampanga 159 students and eight Science teachers, were surveyed to determine their knowledge, attitude, and practice on disaster preparedness in school. Results of the study revealed that students and teachers have moderate to a high level of knowledge in disaster preparedness which means the concepts, ideas, and theories behind disaster preparedness in the school is on the right track. The attitude level of the students and teachers are also generally high in disaster preparedness. However, having high results in knowledge and attitude the students have moderate practice (68.55 %) in disaster preparedness in school. The teachers, however, have high practice but lacks confidence in handling and dealing a disaster in the vent that it occurs. Despite having a moderate to a high level of knowledge on safety, not everyone was familiar with the disaster preparedness signs in the school. Practice should be 100% in all areas since disaster preparedness is a very important requirement for all students to observe. Disaster preparedness measures appear not to have been communicated properly since it did not reach everyone especially the students' family, stakeholders, and the community. It is recommended that students should develop a culture of disaster preparedness in school at all times whether inside or outside the school as a disaster could strike anytime. Teachers should have a solid background on disaster preparedness as role models for students. The disaster preparedness program of the school could be improved by actively including the parents and community to participate in the conduct of disaster preparedness activities. It is also recommended that further studies on the same field or area of disaster preparedness should be conducted by future researchers to add more variables to strengthen the basis and give more depth to data analysis.

***Keywords**: Disaster Preparedness, Knowledge*

INTRODUCTION

Noah, the ark builder from the Bible was lucky enough for he knew and was informed of what was going to happen ahead of time. Unlike Noah, however, we do not know exactly when a natural disaster such as earthquake and tsunamis may strike. Preparing for natural disaster is a different thing. Just recently the Luzon Island have been rocked by a strong magnitude 6.1 earthquake, most Filipinos have been taken by surprise and realized that our country is constantly in battle with natural disasters. The Philippines is noted as one of the most unsafe nations because it is frequently ravaged by natural disasters. Thus, it is essential that people are exposed to training, materials and informed on how to mitigate the impact of disasters.

Science plays a huge role in the service of reducing the risks posed by natural disasters that take so many lives each year. Science provides an opportunity to unleash on disaster risk reduction, to prepare, respond and recover. Science moves the discussion from being about hazard to

being about risk. (Waddington & UNISDR AM United Nations Office for Disaster Risk Reduction

Regional Office for the Americas, 2018). For disaster risk reduction, science is considered in its widest sense to include the natural, environmental, social, economic, health and engineering sciences, and scientific capacities are interpreted broadly to include all relevant resources and skills of a scientific and technical nature(Southgate, R. J., Roth, C., Schneider, J., Shi, P., Onishi, T., Wenger, D., & Amman, W., 2013).

There are gaps and problems identified by countries considered as results of the basic barriers of science-policy-practice connection resulting from the underuse of science which can result from differing objectives, agenda and priorities, as well as differing cultural values and understanding. (Aitsi-Selmi, Murray, Blanchard, & Wenger, 2015). Sadly, however, the perception of safety among some Filipinos is sometimes attributed to superstitious believes and premonitions. How we approach and deal with natural disasters should be more than these outdated beliefs. In the fast-changing modern society our approach should be based on facts and Science. There is a need for professionals and educators to look into this area and help raise awareness to assist parents, teachers, students, school administrators, and other stakeholders on how to respond properly to ensure safety and disaster preparedness of students.

REVIEW OF RELATED LITERATURE AND STUDIES

Science for Disaster Preparedness

Science for disaster risk management 2017 report provide reviews of the scientific evidence base and its practical use in various areas of disaster risk management. The paper cited the need to translate the wealth of available science into language understandable by stakeholders such as policy makers, practitioners and scientists from other disciplines. A fundamental building block is understanding the risks being faced; as well as making sense of the relevant science this also requires enhancing the use of local knowledge. Science needs to produce coherent advice, during emergencies and for long term risk management. Together, scientists, policymakers and communities need to agree on standards that reflect good processes and representations of uncertainties. Citizen science can be a way ahead to providing necessary training and education (Poljanšek, K., Marin Ferrer, M., De Groeve, T., Clark, I., (Eds.), 2017).

Disaster preparedness in the K to 12 Science Curriculum

The Department of Education (DepEd) reiterated the need for strengthening the capacity of schools to enable them to respond in the event of disasters and emergencies to save more lives and ensure resilience. This initiative is pursuant to Republic Act 10871 (An Act Requiring Basic Education Students to Undergo Age-Appropriate Basic Life Support Training); Republic Act 10821 (An Act Mandating the Provision of Emergency Relief and Protection for Children Before, During, and After Disasters and other Emergency Situation); and Republic Act 101 (An Act Strengthening the Philippine Disaster Risk Reduction and Management System, Providing for the National Disaster Risk Reduction and Management Framework and Institutionalizing the National Disaster Risk Reduction and Management Plan, Appropriating Funds Therefor and for Other Purposes (Hernando-Malipot, 2018).

The Philippine Information Agency report that government agencies recognize the need for disaster education among students, the Department of Education (DepEd) the National Disaster Risk Reduction and Management Council (NDRRMC) have started to incorporate disaster

education in schools as part of its curriculum. Under Republic Act 10121 or the Disaster Risk

Reduction and Management Act of 2010. DepEd, OCD, Commission on Higher Education (CHED) and other relevant agencies are mandated by law to integrate disaster reduction and management education in the school curriculum (Casimpan, 2011) ASEAN Safe Schools Initiative reports that, in 2010, the Philippine Disaster Risk Reduction and Management Act was passed, and DepEd created the Disaster Risk Reduction and Management Office (DRRMO) as the focal point in planning, implementing, coordinating and monitoring activities related to disaster risk reduction, education in emergencies and climate change adaptation. Other roles included initiating and coordinating activities with government agencies and civil society organizations, and serving as the clearinghouse for all school safety resources including production and issuance of teaching and learning materials, and distribution of school kits. With the creation of DRRMO, a Disaster Risk Reduction and Management (DRRM) Focal Point for each region and division was assigned (ASEAN Safe Schools Initiative, 2015)

Disaster Preparedness in the Academic Community

A study in Chain identified factors that may shape the knowledge, attitudes and behaviors of community residents in China's Heilongjiang province towards emergency preparedness. Findings of such a study may provide evidence to support the development of effective public risk communication and education campaigns. The study cited those effective responses to disasters depend not only on the strong leadership and coordinated actions of governmental agencies and professional bodies, but also on the efforts of local residents. Emergency preparedness and early self-help efforts of local residents are usually critical for disaster victim survival. Low levels of public awareness and failure to prepare present challenges for emergency response management (Xu, W., Hao, Y., Wu, Q., Ning1, N., You, J., Liu, L., … Gao, L., 2015)

Knowledge, Attitude and Practices (KAP) on Disaster Preparedness

Yamori Katsuya from the University of Kyoto argued that learning should be characterized as a mixture of three components. The first component is learners' "internalization" of knowledge or skill. The second component is the formation and maintenance of a "community of practice (CoP)" that includes those who teach and learn. The third component is the "identity (re-)building" of those who become involved in the CoP. Learning is defined not only by the first conventional component, but also by integration and dynamic development across these three components. In his study he proposed a game-based approach to encourage people learn about disaster. Different aspects of learning can be more important, particularly when we consider disaster education from a much broader and longer perspective. People are not in an active position to deal with the risk, but are just expected to wait for the results of experts' risk assessments and risk control strategies. A deeper commitment by citizens to risk assessment, evaluation, and management is highly emphasized. This type of risk understanding emphasizes collaborative risk assessment and joint risk management requiring the participation of a more diverse set of stakeholders, including not only specialists but also local citizens. (Yamori Katsuya Disaster Prevention Research Institute, Kyoto University, Japan, 2009).

METHODOLOGY

This study employed a quantitative research through the use of a survey questionnaire. The study aims to analyze and interpret the disaster preparedness of students and Science teachers

in terms of their knowledge, attitude and practices. Surveys can be particularly helpful because

they monitor feelings, not just hard facts (National Crime Prevention Council (NCPC), 2003). Through this method, there is an opportunity to discuss with the students about existing issues in communicating safety practices and procedure in the school. The respondents of the study were the secondary students of and the science school teachers of the Dolores National High School during the School Year 2018-2019. A total 159 students and of 8 Science teachers were purposively selected to represent the population of the school. The main instrument used to measure the different variables for this study was a survey questionnaire. The questionnaire was composed of three parts. The first part of the survey dealt with the respondents' knowledge of basic disaster preparedness in school composed of 15 basic dichotomous questions (answerable by "Yes or No".) A "Yes" answer corresponded to one point while zero or no point was assigned to a "No" answer. High knowledge should incur a score of 11-15, moderate 6-10, and low 0-5. The second part of the questionnaire determined the attitude of the respondents towards the disaster preparedness programs in school measured through a five-point scale on degree of agreements on 10 statements. The third part of the survey had 10 questions that determined the general practices of disaster preparedness in school of the respondents. Respondents were asked to rate items based on safety practices programs in the school. The students were made to indicate the frequency how safety is practiced in the school based on their experience.

This study used a descriptive correlational type of research which sought to answer the following questions:
1.How may the students and teachers be described in terms of the following
1.1 Knowledge in Disaster Preparedness
1.2 Knowledge level on disaster preparedness
1.3 Attitude towards observing disaster preparedness
1.4 Practice level in Disaster Preparedness
2.Is there any significant relationship between the students **practice** and:
2.1 *Knowledge* in Disaster Preparedness; and
2.*2 Attitude* on Disaster Preparedness?
3. Is there any significant relationship between the teachers practice and:
3.1 Knowledge in Disaster Preparedness; and
3.2 Attitude on Disaster Preparedness?

DATA ANALYSIS

Table 1.1 Students' Science and Teachers' *Knowledge in disaster preparedness*

Knowledge Statements	Students				Teachers			
	Yes	%	Yes	%	Yes	%	Yes	%
1. Do you know how to identify hazards at school?	151	95.0	8	5.0	7	87.5	1	12.5
2. Do they know what to do in case of an earthquake?	150	94.3	9	5.7	8	100	0	0
3. Do you know the meaning of the following basic safety signs below?	122	76.7	37	23.3	6	75	2	25
4. 	126	79.2	33	20.8	4	50	4	50

5. 	38	23.9	98	76.1	4	50	4	50
6. 	124	78.0	35	22.0	8	100	0	0
7. 	89	56.0	70	44.0	7	87.5	1	12.5
8. 	113	71.1	46	28.9	6	75	2	25
9. 	108	67.9	51	32.1	4	50	4	50
10. Do you know how to use a fire extinguisher in case of fire?	61	38.4	98	61.6	5	62.5	3	37.5
11. Do you know how to read and follow directions from a map?	118	74.2	41	25.8	8	100	0	0
12. Do you know the phone number of the police and the fire station?	65	40.9	94	59.1	6	75	2	25
13. Do you know the location of the fire exits in your school?	76	47.8	83	52.2	8	100	0	0
14. Do you know the location of the designated evacuation area in your school?	70	44.0	89	56.0	8	100	0	0
15. Do you know how to read the early weather warning system?	131	82.4	28	17.6	4	50	4	50

Overall, the knowledge on disaster preparedness in school of the students on disaster preparedness in school could be described as high to moderate level. Out of 15 questions there were only five questions that the students got a score of below 50 percent. This implies that the concepts ideas and theories behind disaster preparedness in the school is on the right track. However, there are basic disaster preparedness and safety signs that student have missed out. It is still alarming because everyone is expected to be familiar with these safety signs as they are part of the basic education curriculum in Science and related subjects.

Table 1.2 Students' and Science Teachers *Knowledge level* on disaster preparedness

Knowledge level	Students'		Teachers'	
	Frequency	Percent	Frequency	Percent
High knowledge (11-15 points)	67	42.14	5	62.5
Moderate knowledge (6-10 points)	74	46.54	3	37.3
Low knowledge (0-5 points)	18	11.32	0	0
Total	159	100.00	159	100.00

The knowledge level of the teachers in disaster preparedness could also be described generally high using their mean scores. 62.5 percent of the teachers' or more than half had a mean score equal to high knowledge. The teachers were able to identify most of the disaster safety signs and were knowledgeable about school hazards they were also knowledgeable on earthquake and

fire drills and know how to read maps. However, there were items that teachers'' scored poorly, there were signs that were not familiar by most of the teachers. As first in line of providing supervision to students in times of disaster in school, teachers could not afford to miss out information on providing safety to students in an even of a disaster. It is important that teacher should consider improving this aspect of the disaster preparedness program of the school.

Table 1.3. Students' Science and Teachers' *Attitude towards observing disaster preparedness*

Statements	Students					Teachers				
	SD (1)	D (2)	SD (1)	D (2)	SD (1)	D (2)	SD (1)	D (2)	SD (1)	D (2)
1. The school is prepared and protected from disaster and potential risks and hazards.	4	5	4	5	4	5	4	5	4	5
2. Safety drills such as Earthquake and Fire drills are done properly in the school.	4	11	4	11	4	11	4	11	4	11
3. The school trains and involves the community and the family for emergency and disaster preparedness.	9	5	9	5	9	5	9	5	9	5
4. The school is prepared for weather-related emergencies such as floods and rains	2	10	2	10	2	10	2	10	2	10
5. I think that the teachers know what to do if a disaster occurs today.	1	3	1	3	1	3	1	3	1	3
6. I am supportive in the incorporation of risk reduction into the curriculum and class work.	6	2	6	2	6	2	6	2	6	2
7. This school has adequate resources to help students in an emergency or crisis.	2	9	2	9	2	9	2	9	2	9
8. I believe citizens should be aware of all potential disasters that could occur the community.	3	10	3	10	3	10	3	10	3	10
9. Teacher often observes for the purpose of protecting safety of students during laboratory and school activities.	3	7	3	7	3	7	3	7	3	7

Statements	Students					Teachers				
	SD (1)	D (2)	SD (1)	D (2)	SD (1)	D (2)	SD (1)	D (2)	SD (1)	D (2)
10. I feel that I Know what to do in case of an emergency.	4	11	23	67	54	0	0	0	1	7

The attitude level of the students in disaster preparedness could also be described generally high using their mean scores. The students agreed that disaster preparedness drills such as earthquake and fire drills ae done properly in the school. They also agreed that disaster preparedness should be incorporated in the curriculum. This shows support from the learners with the integration of disaster preparedness in their lessons and student are willing to learn topics on disaster preparedness in school. The result revealed that although frequent training in disaster preparedness occur in the school, the community and the family members are not being involved in the activities.

Majority of teacher's respondents had positive attitudes towards disaster preparedness in school for various reasons. The most striking negative attitude observed form the science teachers is the school inclusion and involving of the community and the family for emergency and disaster preparedness. The teacher's despite having high positive attitude still showed signs of lack of attitude in responding to disaster.

A great majority of teachers respondents had positive attitudes towards disaster preparedness in school for various reasons, there were also a number of who were undecided, disagreed or strongly disagreed in every attitude statement. These attitudes towards claims for disaster preparedness in school measures present in the school may not be common knowledge or lack of confidence despite various department and school led activities that aims to enhance disaster preparedness. This means that some of the materials or activities may not have been properly communicated since everyone should have been informed. The most striking negative attitude observed form the science teachers is the school inclusion and involving of the community and the family for emergency and disaster preparedness. This indicates a weak point of the disaster preparedness program.

Table 1.4. Students' and Science Teachers' *Practice level in Disaster Preparedness*

Practice level	Students'		Teachers'	
	Frequency	Percent	Frequency	Percent
High Practice	49	30.82	8	100
Moderate Practice	109	68.55	0	0
Low Practice	1	0.63	0	0
Total	159	100	8	100

Table 1.4 presents the practice level of the students' and teachers towards disaster preparedness in school. More than one half (68.55%) of the students' showed to have a moderate level of practice. There were 49 (30.82%) students that were categorized to have a high level of practice on disaster preparedness in school. On the other hand, there was only one student with low practice level on school safety. According to Kitamura (2014) there are three

types of disaster preparedness in school, one of which is personal safety. The items in the questionnaire included disaster preparedness and students were able to relate with the practices.

The practice level of the science teachers towards disaster preparedness in school. The science teachers showed a positive outcome in terms of their disaster preparedness practices. All of the science teachers scored a high practice level in disaster preparedness in school. This means that the teachers could execute their duties properly in case of a disaster. This is in contracts to the finding in the study of Bandaranayake, P.S., Lokubalasooriya, A., Pathirana,N. and Vithanage, V., (2017), wee they found that both knowledge and practices in disaster preparedness were not adequate. This is because disaster preparedness policies in the Department of Education have been established and needs assessment to check the proper execution and implementation of the disaster programs.

Table 2.1. Relationship of Students Practice *vs* Knowledge in Disaster Preparedness

Variables			r-value	p-value Sig.(2-tailed)	Interpretation
Practice	VS	Knowledge	-.189*	.017	Significant

*** Correlation is significant at the 0.01 level (2-tailed).*

** Correlation is significant at the 0.05 level (2-tailed).*

There is a significant relationship in the practice and knowledge in disaster preparedness of the students. The null hypothesis is rejected. There is a directly proportional relationship with the two variables; this means that as the knowledge of the student's increase their practice also increases.

Table 2.2. Relationship of Students Practice *vs* Attitude in Disaster Preparedness in School

Variables			r-value	p-value Sig.(2-tailed)	Interpretation
Practice	VS	Attitude	429**	.000	Significant

*** Correlation is significant at the 0.01 level (2-tailed).*

** Correlation is significant at the 0.05 level (2-tailed).*

There is a significant relationship between the practice and attitude of the (r= -.429*, p<.01) which means that the null hypothesis is rejected. Results from this study have shown that students have high level of attitude. This means that having a high attitude would mean a high practice.

Table 3.1 Relationship of Science Teachers' Practice *vs* Knowledge in Disaster Preparedness

Variables			r-value	p-value Sig.(2-tailed)	Interpretation
Practice	VS	Knowledge	-.302	.468	Not significant

*** Correlation is significant at the 0.01 level (2-tailed).*

** Correlation is significant at the 0.05 level (2-tailed).*

Table 3.2. Relationship of Teachers Practice *vs* Attitude in Disaster Preparedness

Variables			r-value	p-value Sig.(2-tailed)	Interpretation
Practice	VS	Attitude	.142	.738	Not significant

*** Correlation is significant at the 0.01 level (2-tailed).*
** Correlation is significant at the 0.05 level (2-tailed).*

The relationship of science teachers' Practice and Knowledge; and Practice and Attitude in disaster preparedness both turned out to have no statistical significance. There are other factors and variables that can be looked into such as age as shown in other similar studies.

CONCLUSIONS

The following conclusions were drawn in light of the above findings of the study.

1. The finding in this study showed that students' knowledge on disaster preparedness could be described as high to moderate level. The concepts, ideas and theories behind disaster preparedness in the school is on the right track. The knowledge level of the teachers in disaster preparedness could also be described generally high using their mean scores. The teachers were able to identify most of the disaster safety signs and were knowledgeable about school hazards they were also knowledgeable on earthquake and fire drills and know how to read maps. However, there were still some items where in the science teachers' have scored poorly, such as basic signs of evacuation areas. Teachers could not afford to miss out this information and should be expert in responding and handling disaster related incidents in school as they are the first in line to provide protection to the students.
2. The attitude level of the students in disaster preparedness is also generally high. Students agree and shows their support with the inclusion of disaster preparedness in the curriculum as part of their learning. Students' have observed that the community and family as stakeholders are not included in the disaster and preparedness trainings. The science teachers' attitude towards disaster preparedness in school have similar results and can also be described as generally high. Similarly, the teachers have noted that the community is often not included in the trainings and disaster preparedness trainings is mostly done inside the school only with the teachers and students.
3. In this study the results showed that students' have moderate practice (68.55 %) in disaster preparedness in school. Students participate in most disaster preparedness practices in school. However, participation in family earthquake preparedness is never practiced by most of the students. The teachers also have high practice but lacks confidence that they can handle and deal a real disaster in the vent that it occurs. Involving the community on disaster preparedness was a weak point in terms of practices amongst the teachers.
4. There is a significant correlation that exists between the students practice and knowledge in disaster preparedness. This proved that for the students' practice and knowledge is directly proportional. This means the higher the knowledge of the students in disaster preparedness the higher their practice becomes.
5. The study also showed significant relation that exists between the students practice ad attitude in disaster preparedness. This proved that for the students' practice and attitude is directly proportional. This means the higher the attitude of the students in disaster preparedness the higher their practice also becomes.
6. On the other hand the results for relationship on practice and knowledge; and practice and attitude of science teachers in disaster preparedness have both not shown any significant relationship.

Students should develop a culture of disaster preparedness in school at all times whether inside

or outside the school as disaster could strike anytime. Students should be taught that observance of rules in school and family is indispensable to preserve safety and security. Students and Science teachers should be familiar with all the disaster preparedness signs for their own use and protection. Science Teachers should have a solid background on disaster preparedness as role models for students. This will allow teachers to identify key areas where students need to focus more attention to during the conduct of disaster preparedness activities. Teachers should be redundant in reminding students on disaster preparedness and in inculcating preparedness and safety in school to become part of their culture. Parents and community should participate in the conduct of disaster preparedness activities. The disaster preparedness in schools, for example, are events that strengthen and capacitate the connectedness of the students and the people in the community. Communicating disaster preparedness to students through the engagement and interaction of people is a social process. It is about helping one another identify and solve disaster preparedness issues not just for the school but also for the benefit of everyone. The school administrators should consider the use of the Internet in providing information on disaster preparedness since student's access this platform more often. Web sites about promoting school disaster preparedness and social media can be tapped to further advocate safety in school. The Department of Education should be more aggressive in requiring teachers and students to be more disaster preparedness conscious and for it to be cultivated to develop disaster preparedness culture.

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