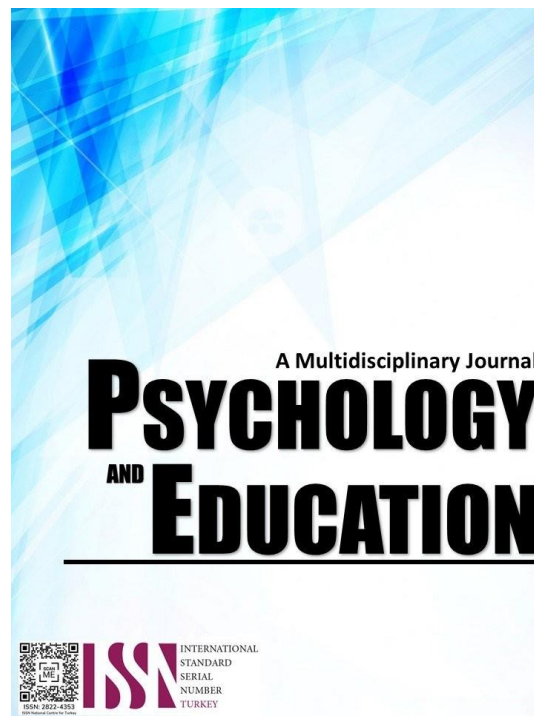


**IMPLEMENTATION OF DISASTER RISK
REDUCTION AND MANAGEMENT PROGRAM IN
SELECTED SCHOOLS IN REGION XII,
PHILIPPINES**



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Implementation of Disaster Risk Reduction and Management Program in Selected Schools in Region XII, Philippines

Hector L. Lavilles*, Alma S. Hordista

For affiliations and correspondence, see the last page.

Abstract

This study determined the level of awareness of the teachers and administrators in natural and man-made disasters as well as their level of preparation and implementation of the DRRM Program. The descriptive-correlational research design was used in the study. The data were gathered through the questionnaire and administered to 96 respondents. The data gathered were analyzed through weighted mean and Pearson correlation. Results of the study showed high awareness of teachers and administrators in natural and man-made disasters. The school personnel also prepared and implemented the DRRM Program. The study also revealed significant relationships between the awareness in multiple disasters and preparation in the DRRM Program as well as the preparation and implementation of the DRRM Program. Given the overall results, the study may serve as a basis for schools to improve the implementation of the DRRM Program through higher disaster awareness and preparation.

Keywords: *school awareness in natural disasters, school awareness in man-made disasters, safe learning facilities, school disaster management, risk reduction and resilience education*

Introduction

Educational institutions have become more intricate and competitive to cope with changes in society. Administrators frequently face challenges between maintaining a reassuring environment with a safe climate for the learners and keeping the school safe, secure, and prepared for handling crises that are difficult to prevent (Trump, 2011). Disaster is an international issue where everyone is entitled to show concern towards attaining zero casualties during a specific Majeure.

More than 400 disasters occur across countries every year affecting more than 230 million people, with casualties of almost 75,000 annually. These disasters prevent learners from going to school for a full year (IFC, 2010). For instance, 400 children died in a 2001 earthquake in Gujarat, India. In Bangladesh, 25-30% of pupils stopped schooling due to the 1998 floods. In America, 165,729,935 people were affected with 154,662 fatalities from 2,101 natural disasters from 1980 up to 2008 (Merchant, 2015). Man-made hazards have also added threats to the lives and welfare of the education community. In Colombia, increasing drop-out rates and expanding over-age learners were due to the adverse effects of armed conflicts, economic hardship, and forced displacement. In the US, fire departments responded to over 3,320 structure fires in schools from 2013-2017. (Villar-Marquez, 2011; Hanna et al., 2019; Campbell, 2019).

The Philippines is prone to multiple hazards. The impacts are heightened due to the conditions conveyed by the existing socio-political and economic underlying forces. Flash floods last November 15, 1991, in Ormoc City killed 5,100 people, while floods and landslides due to Typhoon Trux killed 995 people in the Bicol Region. The latest major earthquake with a 7.2 magnitude occurred in Bohol and Cebu on October 15, 2013, reporting 222 fatalities and 796 injured people (Doroteo, 2015).

Schools in the country are also at risk from man-made disasters. A fire incident due to a faulty electrical connection destroyed one school building in Maguindanao (Punzalan, 2019). Further, a school in North Cotabato was attacked by armed men taking students as hostages for 12 hours (Global Coalition to Protect Education from Attack, 2018). These have adverse effects on the well-being of stakeholders.

To alleviate the effect of the various disasters in the country, the government developed disaster risk reduction management strategies through Republic Act No. 10121 which strengthens the country's disaster risk reduction and management system, providing for the National Disaster Risk Reduction and Management (NDRRM) Framework and institutionalizing the NDRRM plan. The Department of Education (DepEd) observes the policy of the government through the formulation of an inclusive framework in Disaster Risk Reduction and Management (DRRM) (DepEd Order No. 37, s. 2015). However, despite the

mitigating and preventive measures towards DRRM, there are still schools that were not able to cope during a disaster in their location (Bayangos & Relayson, 2015).

In Sultan Kudarat, most schools are susceptible to both natural and man-made disasters due to their geographical location and situation. The location of two schools near a river in Lutayan Municipality is susceptible to floods during heavy rains. In 2014, one school became an evacuation center for a short period due to an armed conflict that happened in a neighboring community (A. Nequinto, personal communication, October 01, 2020). Further, in Columbio Municipality, the schools have experienced a series of strong-magnitude earthquakes from last year up to the current year. These have resulted in the disruption of classes at both elementary and secondary levels. Being located in a mountainous area, the schools are susceptible to major disasters like earthquakes and landslides (W. Surtin, personal communication, October 05, 2020).

The location of most schools in the municipality of Palimbang makes it highly susceptible to both natural and man-made hazards. These schools are located within coastal and highland areas. In terms of natural hazards, landslides frequently occur during heavy rains or even earthquakes. The schools being near the sea, are also prone to strong storm surges and tsunamis (A. Abedin, personal communication, October 03, 2020).

The geographical locations of these schools could increase the possible impacts of a disaster but can also be mitigated through the implementation of the DRRM Framework. The researcher also experienced various impacts of disasters because of the exposure of the school to different types of risks. Important documents were destroyed during a fire incident last 2019 and a conflict due to a clan feud also once occurred in the school community, which exposed the pupils and teachers to armed violence. It is through this lens, that the researcher became interested in studying the implementation of disaster risk reduction management program in selected schools in Region XII, Philippines.

Research Questions

The study determined the implementation of the Disaster Risk Reduction and Management (DRRM) program among selected schools in Region XII, Philippines. Specifically, the study answered the following questions:

1. What is the level of awareness of the teachers and administrators in DRRM for the following natural disasters:
 - 1.1 Floods;
 - 1.2 Earthquakes;
 - 1.3 Storm Surges;
 - 1.4 Tsunamis; and
 - 1.5 Landslides?
2. What is the level of awareness of teachers and administrators in DRRM considering the following man-made disasters:
 - 2.1 Fires;
 - 2.2 Armed Conflicts;
 - 2.3 Terrorism;
 - 2.4 Accidents; and
 - 2.5 Oil Spills?
3. What is the level of preparation of teachers and administrators in DRRM among these schools in terms of:
 - 3.1 Safe Learning Facilities;
 - 3.2 School Disaster Management; and
 - 3.3 Risk Reduction and Resilience Education?
4. What is the level of implementation of teachers and administrators in DRRM among these schools in terms of:
 - 4.1 Safe Learning Facilities;
 - 4.2 School Disaster Management; and
 - 4.3 Risk Reduction and Resilience Education?
5. Is there a significant relationship between the:
 - 5.1 level of awareness in natural and man-made disasters and the level of preparation of DRRM among selected schools; and
 - 5.2 level of preparation and level of implementation of DRRM program among selected schools?

Methodology

The study was a descriptive-correlational design using survey methods of data gathering. The main instrument utilized by the researcher was a survey designed for administrators and teachers. The second phase of the study was a correlation between the level of awareness of teachers and administrators in natural and man-made disasters and their level of preparation in the DRRM program as well as in determining the relationship between the level of preparation and implementation in the DRRM program. The study was conducted in schools with multiple disasters encountered due to their geographical location. The researcher also used frequency, weighted mean, and Pearson r as statistical tools to treat the data.

Participants

The study was conducted on the six (6) immediate administrators of the six selected schools, either the Principals or Assistant Principals. In the same manner, the total enumeration of ninety (90) teachers involved in the implementation of disaster risk reduction management was also selected in the survey of the level of preparation and implementation of the DRRM Program as well as the level of awareness in natural and man-made disasters. There were ninety-six (96) respondents in all. The detailed distribution of respondents for the survey is presented in Table 1 below.

Table 1. *Distribution of Respondents*

<i>Schools</i>	<i>Administrators</i>	<i>Teachers</i>
A	1	14
B	1	20
C	1	14
D	1	9
E	1	18
F	1	15

Instruments of the Study

Survey Questionnaires were developed by the researcher and validated by five experts in Curriculum Development. The questionnaire in the first section covered the level of awareness of teachers and administrators in Disaster Risk Reduction and Management for natural hazards in terms of floods, earthquakes, storm surges, tsunamis, and landslides and was adapted and modified from Marskole (2018). The second section looked into the level of awareness of teachers and administrators in Disaster Risk Reduction and Management for man-made hazards in terms of fires, armed conflicts, terrorism, accidents, and oil spills and was adapted and modified from Marskole (2018). The third section included the level of preparation for the Disaster Risk Reduction and Management program among the schools in terms of Safe Learning Facilities, School Disaster Management, and Disaster Risk Reduction in Education, and was adapted and modified from Batchar (2017).

The fourth section looked into the level of implementation for the Disaster Risk Reduction and Management program concerning the Safe Learning Facilities, School Disaster Management, and Risk Reduction and Resilience in Education and was adapted and modified from Batchar (2017).

Using the rating sheet, five (5) identified experts validated the Survey Questionnaire. The instruments were certified according to their construction and content. This process determined if the objectives of the study were achieved. Moreover, the instruments were checked to make sure that the appropriate data are sought for the study.

Following validation, twenty (20) respondents participated in a pilot test of the instrument. As expected, the respondents in the pilot testing were not included as actual respondents of the study. Data for the test results were statistically treated using Cronbach's Alpha to measure internal consistency and how closely related a set of items were as a group. It was considered to be a measure of scale reliability of the questionnaire.

The SPSS was used to test the reliability of the questionnaire. The result shows that the alpha coefficient for the awareness in natural disasters in five indicators namely: floods, earthquakes, storm surge, tsunamis and landslides were 0.63, 0.73, 0.76, 0.46, and 0.87, respectively. Meanwhile, the alpha coefficient for the

awareness in man-made disasters were 0.79 (fires), 0.56 (armed conflicts), 0.87 (terrorism), 0.84 (accidents) and 0.83 (oil spills). The alpha coefficient for the preparation of the DRRM Program in three indicators were 0.87 (safe learning facilities), 0.86 (school disaster management) and 0.89 (risk reduction and resilience education). Further, the implementation of the DRRM Program has an alpha coefficient for the following: safe learning facilities (0.67), school disaster management (0.88) and risk reduction and resilience education (0.87). The following alpha coefficient for the different variables implied that items have relatively high internal consistency.

Procedure

To collect the data required for this study, the researcher wrote a letter of permission to the Schools Division Superintendent of Sultan Kudarat to conduct this study. As soon as the approval was granted, the researcher coordinated with the administrators to allow him to administer the survey. Schedules were set so that the principals and teachers could answer the survey individually in their vacant time. The survey was done on the scheduled dates set by the principal. The questionnaire was retrieved by the researcher after all respondents had finished answering all the items.

Finally, the data gathered pertinent to the problems of the study were subjected to statistical treatments. Findings were extracted and analyzed based on the results of the treated data. The results of the study were interpreted to arrive at certain conclusions and recommendations.

Statistical Tools

In order to describe the relevant features of the data, the researcher used the following statistical tools:

To answer the sub-problem 1, the researcher utilized frequency and weighted mean to determine the level of awareness of teachers and administrators in Disaster Risk Reduction and Management for natural disasters.

To answer the sub-problem 2, the researcher utilized frequency and weighted mean to determine the level of awareness of teachers and administrators in Disaster Risk Reduction and Management for man-made disasters.

To answer the sub-problem 3, the researcher utilized frequency and weighted mean to determine the level of preparation of teachers and administrators in Disaster Risk Reduction and Management program among the selected schools.

To answer the sub-problem 4, the researcher utilized frequency and weighted mean to determine the level of implementation of teachers and administrators in Disaster Risk Reduction and Management program among the selected schools.

To answer the sub-problem 5, the researcher used Pearson correlation to determine if there is a relationship between the level of awareness in natural disasters and level of preparation in DRRM Program, level of awareness in man-made disasters and level of preparation in DRRM Program, and level of preparation and implementation of DRRM Program. The study tested at 0.01 level of significance.

Ethical Considerations

The observance of ethical standards in research is a primary factor that was considered in the conduct of this study. The observance of ethical standards and guidelines in research is a proactive strategy to establish the reliability and validity of the research findings. The standards are intended to prevent both the researcher and other individuals who are involved in the research such as the participants, the reviewers of the study, the adviser, and the members of the panel of examiners as well as the authorities who will permit to conduct the study from violating certain rights.

The participants were informed of the objectives of the study and the data and information needed from them if they would agree to participate. After they were informed of the objectives of the study, the researcher requested consent to participate from the participants, informing them that at any time in the span of the study they have the freedom to withdraw and withhold information. In this study, voluntary participation of the participants was practiced before they involved themselves in the study.

Further, to ensure the observance of data privacy, the researcher protected the confidentiality of the research participants by shielding them from undesirable consequences. The researcher recognized and acknowledged the participants as co-researchers in the study. The study assured the participants that the information that they divulged would be treated with utmost confidentiality since their names would not be reflected in the results of the

interviews. The privacy of the participants in this study would be at all times protected by maintaining their anonymity in the interviews conducted. The researcher also assured the participants that the data gathered and the information that they disclosed were used solely for this study.

Results

The content of this section presents the awareness of natural and man-made disasters, preparation, implementation, and experiences of the teachers and administrators in the DRRM Program as well as the significant relationship among variables. The various results are presented in the succeeding tables while the discussions for each table were presented in the succeeding paragraphs.

Table 5. *Summary of the Level of Awareness in Natural Disasters*

<i>Indicators</i>	<i>Mean (Admin)</i>	<i>Mean (Teachers)</i>	<i>Mean Value</i>	<i>Interpretation</i>
Floods	4.17	3.94	3.96	High
Earthquakes	4.07	4.03	4.03	High
Storm Surges	3.43	3.50	3.49	High
Tsunamis	3.30	3.47	3.46	High
Landslides	3.57	3.70	3.69	High
Grand Mean	3.71	3.73	3.73	High

Table 6. *Level of Awareness in Man-made Disasters*

<i>Indicators</i>	<i>Mean (Admin)</i>	<i>Mean (Teachers)</i>	<i>Mean Value</i>	<i>Interpretation</i>
Fires	3.90	3.70	3.88	High
Armed Conflicts	3.70	3.88	3.71	High
Terrorism	3.40	3.71	3.47	High
Accidents	3.83	3.47	4.01	High
Oil Spills	3.53	4.02	3.62	High
Grand Mean	3.67	3.76	3.74	High

Table 7. *Summary of the Level of Preparation in the DRRM Program*

<i>Indicators</i>	<i>Mean (Admin)</i>	<i>Mean (Teachers)</i>	<i>Mean Value</i>	<i>Interpretation</i>
Safe Learning Facilities	3.80	4.07	4.05	Well Prepared
School Disaster Management	3.97	4.08	4.07	Well Prepared
Risk Reduction and Resilience Education	4.03	4.05	4.05	Well Prepared
Grand Mean	3.93	4.07	4.06	Well Prepared

Table 8. *Summary of the Level of Implementation in the DRRM Program*

<i>Indicators</i>	<i>Mean (Admin)</i>	<i>Mean (Teachers)</i>	<i>Mean Value</i>	<i>Interpretation</i>
Safe Learning Facilities	4.28	4.15	4.16	Well Implemented
School Disaster Management	4.12	4.02	4.02	Well Implemented
Risk Reduction and Resilience Education	3.85	3.72	3.73	Well Implemented
Grand Mean	4.08	3.96	3.97	Well Implemented

Table 9. *Relationship between Awareness of Natural Disasters and Preparation of the DRRM Program*

		<i>Natural Disasters</i>	<i>Preparation of DRRM Program</i>
Natural Disasters	Pearson Correlation	1	.45**
	Sig. (2-tailed)		.00
	N	480	288
Preparation of DRRM Program	Pearson Correlation	.45**	1
	Sig. (2-tailed)	.00	
	N	288	288

Table 10. *Relationship between Awareness of Man-made Disasters and Preparation of the DRRM Program*

		<i>Man-made Disasters</i>	<i>Preparation of DRRM Program</i>
Man-made Disasters	Pearson Correlation	1	.57**
	Sig. (2-tailed)		.00
	N	480	288
Preparation of DRRM Program	Pearson Correlation	.57**	1
	Sig. (2-tailed)	.00	
	N	288	288

Table 11. *Relationship between the Preparation and Implementation of the DRRM Program*

		<i>Preparation of DRRM Program</i>	<i>Implementation of DRRM Program</i>
Preparation of DRRM Program	Pearson	1	.66**
	Correlation		.00
	Sig. (2-tailed)	288	288
	N		
Implementation of DRRM Program	Pearson	.66**	1
	Correlation	.000	
	Sig. (2-tailed)	288	288
	N		

Discussion

Awareness of Natural Disasters

As shown in Table 5, the grand mean of 3.73 signifies that the level of awareness of the teachers and administrators in natural disasters is high. The result implies that the teachers and administrators are conscious of the different natural disasters that may occur in the school environment and have high knowledge about the different mechanisms for each disaster. They can integrate their awareness into the preparation and implementation of the DRRM Program in the school. Specifically, the administrators and teachers have a high awareness of earthquakes, floods, landslides, storm surges, and tsunamis. Further, teachers have a higher level of awareness of storm surges, tsunamis, and landslides than school administrators.

Likewise, Corpuz (2019) opined that schools as local bases for disaster management including risk assessments and developing capacities for disaster management help build awareness for emergency response to reduce disaster impacts. Also, training in disaster management is essential for increasing the awareness of school personnel for disasters.

Awareness of Man-Made Disasters In terms of man-made disasters, the grand mean of 3.74 signifies a high level of awareness of man-made disasters. Specifically, they have a high level of awareness of accidents, fires, armed conflicts, oil spills, and terrorism. The result implies that the knowledge of the administrators and teachers in man-made disasters is evident. They can share this knowledge with the pupils and community members as a preventive measure against man-made disasters. Moreover, the result shows that teachers are more aware than administrators of man-made disasters like armed conflicts, terrorism, and oil spills.

This is similar to the study of Canales and Sanico (2021) where teachers are very much aware of man-made disasters. Their awareness was influenced by the initiatives of the Department of Education (DepEd), NDRRMC, and PAG-ASA to disseminate disaster-related information. Further, the awareness of personnel in disaster management is positively influenced by their training in first aid and capacity to deal with mass casualty incidents.

Preparation in the DRRM Program

The statistical mean value for the level of preparation of teachers and administrators in the DRRM Program in terms of safe learning facilities, school disaster management and risk reduction and resilience education was 4.06 and interpreted as well prepared. The preparation of a safe and conducive learning environment was evident as well as in the organization of the DRRM Team and integration of its key messages in the curriculum. The majority of the respondents claimed that the mandated programs of the DepEd allowed them to intensify the preparation of activities related to disaster risk reduction and management and to link with external stakeholders for improved school disaster preparation. Similarly, the South East Asian Minister of Education, Organization, Innovation, and Technology (SEAMEO INNOTECH, 2014) revealed that schools act as critical points of learning, cultural celebration, and socialization. Pupils, teachers, and all community members are part of the entire school system. These stakeholders need to interact collaboratively to provide safe and child-friendly schools to the learners. The school has a primary capability to innovate, especially in developing a culture of peace, safety, and resilience towards any type of disaster. Thus, making schools as focal point in disaster risk reduction education for the community is an effective and efficient strategy.

Implementation in the DRRM Program

The result in Table 8 revealed that the DRRM Program was well implemented by the teachers and administrators with a statistical mean value of 3.97 in terms of the three indicators: safe learning facilities, school disaster management, and risk reduction and resilience education. The respondent schools exhibited efficiency in the implementation of different projects, programs, and activities that are intended to intensify the knowledge and skills of the entire community about disaster management. The respondents also stated that they implement disaster management activities in the school that include building a safe environment, organizing disaster teams, and integrating key messages into the curriculum.

Accordingly, the United Nations International Children's Emergency Fund (UNICEF, 2011) explained ways of promoting school safety and disaster management through supporting school-level vulnerability and capacity assessments which include the participation of learners, teachers, and the community. The establishment of early warning systems, training for teachers, and systematic dissemination of good practices of school preparedness and response are also critical in sustaining school disaster management.

Awareness of Natural Disasters and Preparation in the DRRM Program

Pearson Correlation was used to establish the relationship between the Level of Awareness of Natural Disasters and the Level of Preparation in the DRRM Program of administrators and teachers. Results of the correlation showed that there is a significant low positive correlation $r = 0.45$ ($\text{sig.} = 0.00$) between awareness of natural disasters and the level of preparation in the DRRM Program. This positive correlation means that when the awareness of teachers and administrators about natural disasters was high, there was corresponding high preparation for the DRRM Program. Consequently, when awareness of natural disasters was low, one could expect that there would be lower preparation for the DRRM Program.

So, the null hypothesis (H_0) which states that there is no significant relationship between the level of awareness of natural disasters and the level of preparation in the DRRM Program is rejected. Thus, there is a significant relationship between the level of awareness of natural disasters and the level of preparation in the DRRM program of the administrators and teachers.

The result is similar to the study made by Mutarak and Luz (2014) which agreed that education plays a pivotal role in minimizing the risks of extreme climate events in all possible ways. Formal education has a crucial role in delivering competencies to increase the capacity of people to respond to any type of disaster. Indirectly, education also contributes to alleviating the socio-economic status of different households making them avail of different resources relevant to disaster preparedness, mitigation, and sensitivity.

Awareness of Man-Made Disasters and Preparation in the DRRM Program

Table 10 presents the result of the relationship between the level of awareness of man-made disasters and the level of preparation in the DRRM Program of the administrators and teachers. The correlation between awareness of teachers and administrators on man-made disaster and preparation of the DRRM Program were significantly moderate positive correlation with a correlation value of $r = 0.57$ ($\text{sig.} = 0.00$). This positive correlation between the awareness of teachers and administrators on man-made disasters and preparation for the DRRM Program signified that a higher awareness of man-made disasters implies a higher preparation for the DRRM Program.

The null hypothesis (Ho2) which states that "there is no significant relationship between the level of awareness in man-made disaster and level of preparation in DRRM Program" is rejected. Thus, there is a significant relationship between awareness of man-made disasters and preparation in the DRRM Program.

Worth noting is the result of the study of Noble and McGrath (2014) that man-made disasters across countries over time have led to greater awareness and better responses from individuals. The sense of vulnerability among people increased by recognizing the importance of education in teaching local communities to prepare, mitigate, and respond to any type of disaster.

Preparation and Implementation of the DRRM Program

Table 11 presents the relationship between the level of preparation and implementation of the DRRM Program of the administrators and teachers. Results of the correlation test showed that there was a significant moderate positive correlation between the preparation and implementation of the DRRM Program with an r -value of 0.66 ($\text{sig.}=0.00$). This positive correlation means that when the preparation of teachers and administrators in the DRRM Program was high, there was a corresponding high level of implementation of the DRRM Program. Consequently, when the level of preparation was low, one could expect that there would also be low implementation of the DRRM Program.

Hence, the null hypothesis (Ho3) which states that "there is no significant relationship between the preparation and implementation of the DRRM Program" is rejected. Thus, there is a significant relationship between the preparation and implementation of the DRRM program.

Shaw et al. (2011) provided empirical evidence that careful planning and preparation of structural interventions in schools helped positively in the implementation of various programs that mitigate the adverse impacts of disasters. Shaw et al. (2011) acknowledged that education plays an indispensable role in reducing disasters and maintaining security to achieve sustainable development. Learners who were taught about disasters and how to react based on the specific hazard were able to respond promptly and appropriately.

Conclusion

Based on the results of the study, the researcher concluded that the teachers and administrators have a high awareness of natural disasters such as floods, earthquakes, storm surges, tsunamis, and landslides. The teachers and administrators are conscious of the different natural disasters that may occur in the school environment and have high knowledge about the different mechanisms for each disaster. Further, there is high awareness among teachers and administrators of man-made disasters such as fires, armed conflicts, terrorism, accidents, and oil spills. Their knowledge is evident and can integrate this knowledge into the preparation and implementation of disaster management in school. The teachers and administrators are well prepared for the activities of the DRRM Program. Thus, they have performed the necessary mechanisms related to the preparation of the program. Similarly, the DRRM Program is well implemented. Moreover, the study concluded that there is a significant low positive correlation between the level of awareness of natural disasters and preparation in the DRRM Program. Meanwhile, there is a moderate positive correlation between awareness of man-made disasters and preparation in the DRRM Program. And, there is a significant moderate positive correlation between the preparation and implementation of the DRRM Program. Therefore, the school should religiously prepare all the activities in the pillars of safe learning facilities, school disaster management, and risk reduction and resilience education to ensure a higher level of implementation of the DRRM Program.

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Affiliations and Corresponding Information

Hector L. Lavilles Jr.

Glan Institute of Technology – Philippines

Alma S. Hordista

Notre Dame of Dadiangas University - Philippines