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Correlates Schools Disaster Risk Reduction and Management (DRRM) Implementation and School Performance in Safety and Readiness: Basis for Enhanced Action Plan

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ABSTRACT

The study aimed to assess the level of DRRM implementation, school performance, the correlation between the two, identify which DRRM components significantly influence school performance, and propose an enhanced action plan. A descriptive-correlational method was used, with data collected through a survey questionnaire. Results showed that both DRRM implementation and school performance were at a high level. Regression analysis revealed that disaster prevention and mitigation, disaster preparedness, and disaster rehabilitation and recovery were significant predictors of school performance. The proposed enhanced action plan aligns DRRM targets with safety and readiness indicators, suggests appropriate budget allocation based on existing policies, and defines measurable success indicators. A context-based approach is recommended to adapt the action plan according to the unique conditions and experiences of each school, ensuring that safety priorities are effectively addressed.

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1. INTRODUCTION

Schools, as most homes to learners and teachers, are susceptible to any harm brought by disasters. All schools experience natural disasters such as earthquakes and among others (Tuladhar *et al*., 2014; Cvetković *et al*., 2015). However, some schools have certain experiences with man-made disasters or hazards such as chemicals released by factories and similar cases. Thus, schools experience common disasters/risks, and specific catastrophes are encountered depending on the location and situation. The Department of Education (DepEd) issues guidelines through DepEd Order No. 83, s. 2011, which mandates disaster-preparedness measures for schools. The purpose of this is to alleviate the damage and accidents and, most importantly, equip the school to be ready for any disasters.

Administrators of DepEd do an ocular inspection to see if the schools strictly follow the standard for safety and, at the same time, readiness. Preparations for the requirement are done. One of the bases for this school performance is the Brigada Eskwela (Olaivar & Pobar, 2017), which happens yearly and is reflected in the school improvement plan (SIP). Due to this, it can contribute to the continuous improvement of Disaster Risk Reduction and Management (DRRM) in the country.

In a released report of the Hyogo Framework for Action 2005-2015, the Philippines has succeeded in the DRRM aspects under RA 10121. In disaster prevention and mitigation, the country has attained to conducted assessments of risks in various locations in the country, developed and established early warning systems, developed tools for risk assessments, involvement of both local and the local government unit (LGU) in disaster risks management, developed DRRM tools for planning systems, frameworks in DRRM, presence of multi-sectoral platforms and allocation. For disaster preparedness, achievements are the conduct of various DRRM research, dialogues on DRRM, various capacity building, regular review of contingency plans, development of information, education, and communication (IEC) materials, development of database generation, inclusion of DRRM in school curricula, and available procedures on disaster communication. Established mechanisms for response operations and improved search, rescue, and retrieval skills are the success in disaster response. Lastly, the rehabilitation and recovery achievement include Disaster Risk Reduction (DRR) mainstreaming in social, economic, and human settlements development plans; conducting post-disaster assessments, integrating DRR in rehabilitation and recovery processes, and incorporating DRR elements for human settlements.

In the continuation of the sustainable campaign and implementation of DRRM among countries after the success of the Hyogo Framework for Action, the Sendai Framework for Disaster Risk Reduction for 2015-2030 is set to aim for an outcome to achieve after its conception. The premise it targets is the substantial disaster risk reduction and the loss of lives, health security, and the safety of livelihoods, as well as the physical, economic, cultural, social, and environmental sources of the people, commerce, society, and nations. In addition, specifying this outcome is the set of priorities which are focused on in this framework, and these are:

(i) Priority 1: understanding disaster risk, priority
(ii) 2: strengthening disaster risk governance to manage disaster risk, priority
(iii) 3: investing in disaster risk reduction for resilience, and priority
(iv) 4: enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation, and reconstruction (Johnston, 2014).

The Philippines has a comprehensive set of DRR policies, frameworks, and plans that promote high implementation of school DRRM programs (Manuel & Gelido, 2021). While this

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literature emphasized how the Philippines complies with DRRM, the truth is that the school's performance does not synch anent to this.

On the other hand, school performance is usually described based on the academic achievement of the students and their attendance rates in the Philippines. This has forgotten some effectual factors such as environment, particularly the safety and security of teachers and students, that can affect students' academic performance and presence. Performance is more than academic, and it considers and deals with myriad factors such as personal, contextual, and environmental

About this gap not being seen or might not be in the spotlight of most educational learning papers, the researcher has seen this opportunity to explore the two by correlating them. This study assessed the public high schools on implementing DRRM and school performance in safety and readiness relationships.

2. METHODS

2.1. Research Design

The study employed the descriptive-correlational method. The method caters to the inquiry of this study by allowing it to describe the subjects' condition and behaviors, settings, or events and is associated with their level of implementation and the extent the school performance in safety and readiness.

2.2 Sampling and Respondents

Five schools were involved in the study, wherein the method of getting the respondents was the complete enumeration of the subject schools. Meaning all the teachers in the five schools were the respondents. This strategy was employed and feasible for this study. This provides a true measure of the population and avoids the sampling error, which, according to (Cardini *et al.,* 2015), is more accurate, more reliable, and has heterogeneous data.

Teachers were chosen to be the respondents because among all the school constituents and human resources of the Department of Education, they are the majority and diverse. Moreover, they are directly to most of the school programs' implementation, including the DRRM and learning per se. A total of eighty-one (81) teachers from five schools participated in the study. Sixty-one (61) are females, and twenty (20) are males. In terms of age, length of service, and subject handles is varied.

2.3. Ethical consideration

The respondents were given a consent form to inform them about the study, which also contained permission to ask them to be participants in the study.

2.4. Rapid mixing and neutralization basin (physicochemical treatment)

A survey questionnaire was used to get the data. The questionnaire underwent with validity and reliability test. Two experts validated the questionnaire through the content validity index, and the instrument passed the evaluation. A pilot test was conducted to test the reliability of the instrument through Cronbach's Alpha.

3. RESULTS AND DISCUSSION

3.1. Scholl-Level Implementation of DRRM

The **Table 1** shows the results of the school-level implementation of DRRM. Chronologically, the school teachers think that when it comes to the thematic areas of DRRM prevention and mitigation (M=3.06, SD=0.49) is well implemented among the other areas.

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This is followed by disaster response (M=2.99, SD=0.59) and disaster preparedness (M=2.99, SD=0.51). Though the SD results have a little difference, this result is still the same. Lastly, disaster rehabilitation and recovery (M=2.98, SD=0.49) is also highly implemented in schools. The total result shows good (M=3.00, SD=0.47), described as high implementation in schools.

Table 1. Explain findings of the school's level implementation of DRRM

Indicators	Mean ± SD	Description	Interpretation
Disaster Prevention and Mitigation	3.06±0.49	*Good*	*High implementation*
Disaster Preparedness	2.99±0.51	*Good*	*High implementation*
Disaster Response	2.99±0.59	*Good*	*High implementation*
Disaster Rehabilitation and Recovery	2.98±0.49	*Good*	*High implementation*
Total Measure	**3.00±0.47**	***Good***	***High implementation***

The indication of rating the prevention and mitigation implies the belief of the schools that preventing disasters before they happen is desirable, and mitigating their effects by taking the precautionary measures described by the national government would be beneficial to the school in the preparedness thematic area, school preparation is essential as a disaster, whether predicted or not, can happen at any given point in time. As most administrators experience, prepared schools receive less damage from the consequences of disasters. This is also reflected in the disaster response. This is also the reason why the two areas have the same mean score. Lastly, rehabilitation and recovery are rated as high implementation.

The schools succeeded in implementing DRRM as it is congruent with the report of the Hyogo Framework for Action (HFA) on the success of the Philippines. The four thematic areas of DRRM have been attained by the different agencies of the government, including the DepEd. However, some studies contradict the result of this study. In (Bacus, 2020) findings, he presented that the implementation of DRRM in Cebu City is low and not impressive. To improve the result, stressed the strategic integration of DRRM in education and Climate Change for Action (CCA) (Ogra & Weekly, 2022). This is an integration into the curriculum of schools which also provides every employee to be trained and possess knowledge, skills, and attitudes in prioritizing learning the ideas involved in it (Olaivar & Pobar, 2017; Maglangit *et al.,* 2019).

3.2. School Performance in Safety and Readiness

It can be gleaned from the **Table 2** that among the indicators for school performance in safety and readiness, the health protocols (M=4.14, SD=0.77) are the highest. In opposite, the drainage system (M=3.51, SD=0.90) has comparable results to others. The overall result indicates that the school's performances in the involved school under study have a very satisfactory level, which denotes a high performance for schools.

The school has to maintain the ecology of safety and be ready to operate the school in an academic year where one biggest factors for conducive learning is the environment of the students. The consideration of the indicators mentioned is part of the DepEd Order No. 33, s. 2021 (Abejuela *et al.,* 2020) mentioned some of those indicators that the school has to note. The rise of prioritizing health protocols for schools is in context since the current time is dealing with the pandemic. In (Acaylar & Reyes, 2021) study, it is seen among the school governance the emergence of employing health program. Moreover, the results show what a school must be and how the school imposes resiliency by preparing all those lists, enclosed that the determinants for school disaster safety accounts the inclusion of education curriculum, the school commitment for conducive environment, the preparation of facilities

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and assessed infrastructures, the enactment of policy and institutional roles, the spread of information, supervisory system, and the school constituents (administrators, staff, teachers and especially the learners) are all pillars of increasing school resilience (Johnston, 2014).

Table 2. Explain level of the school performance in terms of safety and readiness.

Indicators	Mean ± SD	Description	Interpretation
1. Coordination with different school stakeholders	3.90±0.80	*Very Satisfactory*	*High performance*
2. School DRRM Plan	3.73±0.77	*Very Satisfactory*	*High performance*
3. Evacuation map and plan (e.g., entrance, exit, evacuation routes, evacuation room, etc.)	3.70±0.98	*Very Satisfactory*	*High performance*
4. Safety Signages	3.78±0.96	*Very Satisfactory*	*High performance*
5. Alarm systems and warning signs (floods, fire, earthquake, etc.)	3.68±0.86	*Very Satisfactory*	*High performance*
6. Drainage systems	3.51±0.90	*Very Satisfactory*	*High performance*
7. Communication Plan (emergency contacts, etc.)	3.78±0.92	*Very Satisfactory*	*High performance*
8. Conduciveness for learning (includes but is not limited to: child-friendly, pruned trees, etc.)	3.88±0.75	*Very Satisfactory*	*High performance*
9. School Building and Electrical Wiring Evaluation	3.78±0.74	*Very Satisfactory*	*High performance*
10. Classroom structuring/Service rooms structuring	3.96±0.83	*Very Satisfactory*	*High performance*
11. Health Protocols	4.14±0.77	*Very Satisfactory*	*High performance*
12. Facilities (e.g., clinic, isolation area, etc.)	3.90±0.77	*Very Satisfactory*	*High performance*
13. Contingency Plan (Plan B)	3.90±0.78	*Very Satisfactory*	*High performance*
14. Individual Identity Cards	3.74±0.88	*Very Satisfactory*	*High performance*
15. List of most vulnerable individuals	3.60±0.85	*Very Satisfactory*	*High performance*
16. Trained Individuals (teachers)	3.56±0.88	*Very Satisfactory*	*High performance*
17. Campaign on disaster awareness among school constituents	3.74±0.75	*Very Satisfactory*	*High performance*
18. DRRM integration in subject areas	3.70±0.84	*Very Satisfactory*	*High performance*
19. Available Resources (e.g., medicines, foods, supplies, etc.)	3.62±0.85	*Very Satisfactory*	*High performance*
20. Security and Safety of school records and other school equipment	3.80±0.84	*Very Satisfactory*	*High performance*
21. Different Drills for Emergencies	3.74±0.77	*Very Satisfactory*	*High performance*
22. Accommodation for the community (if necessary to evacuate to the school)	3.89±0.87	*Very Satisfactory*	*High performance*
23. Educational continuity (after emergency)	3.79±0.85	*Very Satisfactory*	*High performance*
24. Total Measure	3.77±0.65	*Very Satisfactory*	*High performance*

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The public schools have a vital role in instilling the knowledge necessary for preparing the school and making it ready for any possible situation, which affects the teaching-learning. The Philippine school performance shows more responsiveness and readiness compared to that of neighboring country Indonesia when it comes to readiness in facing disasters, and this is due to the experience of the Filipinos to be resilient and learned from the past. Meanwhile, with the roles of the teachers, they found no difference between the two countries (Hamid *et al.,* 2021).

3.3. Significant Relationship of DRRM Implementation and School Performance in Safety and Readiness

The **Table 3** shows that the school for DRRM (SDRRM) implementation and school performance were highly correlated (r=0.646, p=0.000). In addition, the different areas of SDRRM implementation, like disaster prevention and mitigation, disaster preparedness, disaster response, disaster rehabilitation, and recovery, were significantly associated with the perceived school performance (all p-values <0.01). This result suggested that a high level of SDRRM implementation is also a high level of school performance. Thus, there is a significant relationship between the SDRRM implementation and school performance.

Table 3. Explain Relationship between the DRRM implementation and school performance.

SDRRM Implementation	**School Performance**		**Remarks**
	r-value	*p-value*	
Disaster Prevention and Mitigation	0.608**	0.000	*Significant*
Disaster Preparedness	0.617**	0.000	*Significant*
Disaster Response	0.535**	0.000	*Significant*
Disaster Rehabilitation and Recovery	0.593**	0.000	*Significant*
Total Measure	**0.646****	**0.000**	***Significant***

As an explication of the data given, the four thematic areas, such as Disaster Prevention and Mitigation, Disaster Preparedness, Disaster Response, and Disaster Rehabilitation and Recovery, correspond to the school performance in safety and readiness. The statements in school performance can be reflected in the thematic areas, where each statement can be suited to one area or more. Under the first are which is prevention and mitigation, the school performance indicated and match to this area are preventive and school maintenance, safety signage, alarm systems and warning signs, drainage system, classroom structuring/service rooms structuring, health protocols, facilities, campaign on DRR, and DRRM integration on subject areas.

In the preparedness area, the school performance accentuated here are the coordination with different stakeholders, SDRRM plan, SDRRM Committee, evacuation map and plan, safety signage, alarm systems, communication plan, school building and electrical wiring evaluation, classrooms/service rooms structuring, facilities, contingency plan, ID, list of vulnerable individuals, trained individuals, campaign on DRR, available resources, security and safety of school records, drills, and accommodation.

For the disaster response area, statements from safety and readiness indicators aligned to it are coordination with different school stakeholders, the school DRR plan, and the school DRR committee through the response team, alarm systems, communication plan, ID, and a list of vulnerable individuals.

The last area, which is rehabilitation and recovery, the statements under school performance in safety and readiness are coordinated with different stakeholders, the SDRRM

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committee, communication plan, conduciveness for learning, which entails restoration, facilities, ID, resources like food and medicines, accommodation, and educational continuity.

Different statements in the school performance in safety and readiness are labeled into four thematic areas, which signify the association of the implementation of DRRM in schools and the school performance. This study infers that the level of implementation fostered by schools would have a relative effect on the school's performance.

It would be a high implementation level, then the high school performance in safety and readiness follows. This also entails that the success of the implementation of DRRM is the completion of the statements present in the school. Important to note that there must be consideration of what components are relevant to each thematic area of DRRM. There are reasons why this high implementation of DRRM and school performance appeared in all the schools involved, which can be explained with relative findings.

In DepEd Order no. 33, s. In 2021, the implementation of DRRM through the preparedness measures is consonant with both DRRM implementation and school performance indicators vis-à-vis safety and readiness. These are the availability of updated baseline education data of the school; school records, documents, equipment, and learning materials should be stored in secured rooms; removal of structures or items that obstruct the movement to evacuation ground; prune trees that can cause damage to people and structures; clean and clearing drainage system; annual risk assessment; coordination with local DRRM council; create and update DRRM contingency plan; DRRM regular school programs; temporary learning space; establish early warning system; emergency hotlines; available emergency equipment and supplies; drills; capacity building among constituents; and, evaluation of electrical lines. This is to ensure that the schools are resilient in any disasters where the Hyogo Framework for Action was made to consider resilience among schools, and the relevance of the creation of the Sendai Framework for Disaster Risk Reduction to continue the former framework by recognizing the safety of school sites, implementation of education and access to educational content (Johnston, 2014).

The success of the Philippines when it comes to readiness, compared to other countries, is directly attributed to integrating DRRM into the curriculum and offering it as a separate subject area. There is also a correlation between disaster experience and management behavior, which resembles the Filipinos' high awareness and attitude towards disaster. It is also rooted in the fact that the Philippines is the third-highest-risk country in the world. Given that, the Philippines must prepare and implement strict measures to comply with what is needed in the prevention and mitigation, preparedness, response and rehabilitation, and recovery (Picard, 2017).

In the study of other literature (Faustino *et al.,* 2019), they found a high level of effectiveness in implementing DRR among students. What is more interesting is that they revealed higher levels for personnel, which included teachers. This is to show that the schools performed well in the successful implementation of DRR. However, (Mamon *et al*., 2017) declared in his study that the four thematic areas were rated differently in his locale of study. The results were prevention and mitigation (fair), preparedness (fair), response (poor), and rehabilitation and recovery (satisfactory). In this case, it could differ in results in the school performance if the results are analyzed in each of the four thematic areas. In this study, this is not verified because the results from the four areas were all good, and so the summed result was good. This can also lead to the idea that the four thematic areas can be different in how it implemented in schools and locations.

How big the land area of a school is and the number of people evacuating, a good implementation of DRRM results in high levels of success. This study has used five schools as

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subjects with different categories in size and population. Good implementation from these schools has seen similar results regardless of the area and number of people therein. The readiness in the locale of the study had a high level of readiness (Corpuz, 2019). Further, she confirmed the correlation of school readiness to school implementation, which says that the higher the level of implementation of DRR would significantly follow the level as higher the level of readiness (Corpuz, 2019).

3.4. Regression Analysis on Predicting School Performance by DRRM Areas

In **Table 4** result revealed that disaster prevention and mitigation (β=0.312, t=2.180, p=0.032), disaster preparedness (β=0.401, t=2.277, p=0.026) and disaster rehabilitation and recovery (β=0.344, t=2.628, p=0.010) were significant predictors of school performance. This result suggested that the higher level of implementation in these areas could have resulted in a high level of school performance in terms of safety and readiness. The regression model is significant (F=17.016, p-value≤0.01). The adjusted R2 is 0.445, or simply 44.5% of the total variation of the school performance was accounted for by these predictors (four areas of SDRRM). For this reason, the DRRM significantly predicts the school's safety and readiness performance.

Table 4. Explain regression analysis for predicting school performance by the areas of DRRM.

Model	Unstandardized Coefficients		Standardized Coefficients B	t-value	p-value
	B	Std. Error			
(Constant)	0.686	0.381	--	1.801	0.076
Disaster Prevention and Mitigation	0.414	0.190	0.312	2.180*	**0.032**
Disaster Preparedness	0.505	0.222	0.401	2.277*	**0.026**
Disaster Response	-0.345	0.206	-0.315	-1.679	0.097
Disaster Rehabilitation and Recovery	0.450	0.171	0.344	2.628**	**0.010**

Note: Adjusted R2 = 0.445 (F=17.016, p-value≤0.01)
*-significant at 0.05 level (p-value≤0.05)
**-significant at 0.01 level (p-value≤0.01)

The regression model tells us that for a unit increase in disaster prevention and mitigation, there is a corresponding 0.414 unit increase in the school performance, holding the other variables constant.

This examination of the four areas explains the closely relative and impactful areas to determine the school performance level in safety and readiness. This leads to a notion that whenever the implementation focuses more on the areas of prevention and mitigation, preparedness, rehabilitation, and recovery would determine the result and anticipate that the school performance follows. For instance, statements under the prevention and mitigation, such as preventive and school maintenance, drainage system, alarm system, warning signs, and the like, are usually the requirements inspected in the schools by the city division or the local government unit, as reflected in the DepEd Order no. 31 and no. 71, s. 2021.

Due to this process of complying with the requirement, the school's performance level is complete. This is also the same with preparedness and rehabilitation, and recovery, and what are the statements stipulated in the school performance under these two areas? The

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probable reason for disaster response not to predict the school performance is a prerequisite for it to be determined, and it happens when there is proper planning and preparation. So, this does not directly implicate the school's performance.

The description it gives to this area is that activities during the actual scenario of disaster take place, and disaster response operations are held. This involves assessment, SRR, and early recovery activity. What important note provided in this long-term plan states that the realization and successful conduct of this area heavily depend on the first two areas, which are prevention, mitigation, and preparedness. A prerequisite activity that is done first in the first two areas includes coordination and communication. Partnerships, vertical and horizontal coordination work, are key factors in achieving a good disaster response.

Further, this surely leads towards early recovery to long-term recovery work. This study agrees with this explanation. Though disaster response does not serve as a predictor based on statistical analysis, it can be effectively implemented based primarily on prevention and mitigation (strategic approach to identify, assess, and analyze) and preparedness (strategic action focused on awareness and understanding).

3.5. Proposed Enhanced Action Plan for Schools

Creating an action plan on DRRM enhances the disaster preparedness and capacity of the school constituents. Conditioning people on what to do when a disaster happens can help control the situation (Natividad, 2019). As it was depicted in this study that the DRRM plan already exists, then the next step is to enhance this plan (action plan), so that it can be suited to the context and be meaningful to the program, and help in the best implementation of DRRM.

In a module learning SEAMEO Innotech , the mindset that leaders of schools should have is being futuristic and making assumptions about the possibilities of disasters when designing the plan. Researchers proposed steps to follow to ensure the effectiveness of a plan. First is assessment. The second is planning and implementation. Third is testing the mitigation and preparedness. Last is to revise the plan according to experience (contextualized or the CBA).

Previously analyzed and interpreted data were presented, and those results were used as a reference in enhancing the existing action plan. Since the results are relative among respondents from one school to another predicted in this research. The proposed enhancement follows the thematic areas and the school performance statements. To further improve, employ the steps mentioned above.

In **Table 1**, the enhanced action plan is shown. In the columns, it can see the areas which refer to the four thematic areas of DRRM. The objectives are rooted in the statements used in the study to gather the data. The school performance contains the elements used to rate the school on safety compliance and the readiness for any disaster risks, which can also be found in the research tool. With the source, the main funds that the school can rely on are the maintenance and other operating expenses that are based on the school population. Aside from that, other parties give to the schools. The budget, as mentioned, 5% from the MOOE shall be utilized as mandated by the government. Persons involved and timeline are also important in the plan. Lastly, the success indicators.

The difference between the proposed enhanced action plan from the previous action plan, usually submitted by schools, does not intersect with the DRRM implementation and school performance in terms of safety and readiness. It is considered the same. However, the researcher argues that though the DRRM implementation is relative to the school performance, the DRRM thematic areas and measures in safety and readiness are distinct. It is to noting that since there is a significant relationship between them, ensuring that their

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areas and indicators align must be regarded. In the plan, the distinct features it has are brought from the old plan that was used in the subject schools and are focused on the thematic areas, the school performance indicators, budget al location by percent, and the success indicators. With this, it can be expected from the schools that they will develop further their implementation, which also determines the school's performance.

The action plan enhancement can follow the steps in improving this one and in aligned with the context of the school. It is important to note that an enhanced action plan takes revision and development. The steps mentioned are the assessment, plan, and implementation, test the mitigation and preparedness, and revision. This is offered to schools to make their plan better and suited to the needs of the school constituents.

The study on the level of implementation of select public schools and the school performance in safety and readiness has concluded with a result of good implementation among the participating schools. As it correlates with the school performance, it revealed a very satisfactory significant relationship where the implementation level goes high, then the school performance goes high.

The context-based approach is the theory this study used. In the implementation of DRRM in schools, it is underlined that the context of the schools should be reflected in the action plan and how the implementation process is put into action. It is believed here that aside from the compliance being shown by the schools, part of the high implementation and high performance on safety and readiness are anchored in the contextualization of schools towards understanding disasters.

4. CONCLUSION

The implementation of the DRRM in schools is a manifestation of complying with the mandate of the government to become a resilient and better school. The school performance focuses on safety and readiness, ensuring the conduciveness of the ecology of learners towards learning. Schools must consider safety and security as a big factor in the pursuit of learning to increase the quality and productivity of the learners. Not only that, a school is home for different generations from the administrators down to the learners. Therefore, the school must be maintained and serve as a haven for everyone.

Due to the geographical set-up of schools in the Philippines and also in other countries, contextualizing the conditions of every school is important. This research recommends that each school evaluate its school performance by exploring the safety and readiness of its school and evaluating its action plans for a better school ecology while implementing the DRRM.

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6. AUTHORS' NOTE

The author declares no conflict of interest in the study and certifies that the paper is an original work that is free from plagiarism.

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