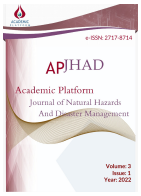

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Designing an Online Typhoon Mitigation Program

Resti Tito H. Villarino[1,2*], Maureen Lorence F. Villarino[2,3]

[1]Cebu Technological University, Moalboal, Cebu, Philippines
[2]National Research Council of the Philippines, Manila, Philippines
[3]West Visayas State University, Iloilo City, Philippines

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Abstract

Awareness, education, readiness, predictive, and warning systems can help communities mitigate the disruptive effects of a natural disaster such as a typhoon. Typhoon mitigation plays an essential role in disaster risk management because it provides accurate and relevant knowledge and skills before, during, and after typhoon procedures. The article summarized a novel, evidence-based approach to developing an online typhoon mitigation program. The program is based on the adapted and contextualized from the Community Disaster Preparedness Handbook by the Department of Disaster Management (Virgin Islands), Weather Underground (owned by the Weather Company, a subsidiary of IBM), the Tropical Cyclone and Typhoon Action Plan by the Liberty Specialty Markets, and the Philippines' National Risk Reduction and Management Plan for 2011-2028 guidelines. It discusses future directions in the fitness-for-purpose process evaluation, assessment, and documentation.

Key words: Climate change, Disaster risk management, Natural disasters, Typhoon mitigation

1. Introduction

Climate change outcomes have tremendous effects worldwide [1]. Its negative impacts include extreme weather, polluted air, health risks, rising seas, warmer, more acidic oceans, and imperiled ecosystems [2]. Furthermore, climate change outcomes such as typhoons significantly affect people's lives [3].

Situated in the Western Pacific typhoon belt and the Pacific Ring of Fire borders, the Philippines is constantly hit by numerous natural catastrophes. Between June and November each year, typhoons often create flooding, landslides, and storm surges around the country, resulting in the loss of lives, homes, and livelihoods [4]. Moreover, the Philippines belongs to countries prone to the impact of climate injustice: provinces with the least socio-economic resilience and vulnerable groups, such as individuals with disabilities, are disproportionately affected by extreme hazards [5].

Recently, super typhoon Rai, locally known as Odette, made its first landfall on December 16, 2021, bringing torrential rains, violent winds, floods and storm surges to the Visayas and Mindanao Islands. Overnight, the typhoon left thousands of families with damaged homes and some were even homeless and displaced, placing at risk some of the impressive social

* Corresponding author e-mail: maureenvillarino@gmail.com

and economic gains made since recovering from the fallout of the COVID-19 pandemic of the past two years.

Disaster mitigation is defined as avoiding or reducing the danger of natural hazards, including typhoons threatening life, property, social and economic activities, and natural resources [6]. Awareness, education, readiness, predictive, and warning systems can help communities mitigate the disruptive effects of a natural disaster. Post-disaster studies continue to support the core truth that community investment in disaster mitigation pays immediate rewards in the event of a disaster [7]. However, limited studies were conducted on pre-disaster intervention [8], [9]. Thus, this study addresses a critical gap. Moreover, this study will empower the general public on typhoon mitigation anchored on the Philippines' National Risk Reduction and Management Plan for 2011-2028 guidelines.

1.1. Purpose

An online typhoon mitigation program geared toward the general public was established to address this increased demand to support and echo the National Disaster Risk Reduction and Management Council (NDRRMC) guidelines. This article will discuss its development, rationale, and benefits to the general public during a typhoon. Additionally, the innovative nature of this online typhoon mitigation program will be highlighted. To the extent that the online typhoon mitigation program described here is innovative, it is primarily due to the combination of the features detailed in Tables 1 and 2.

Table 1. The online typhoon mitigation program's features, evidence-based content, and benefits

Feature	• Online access • Use of multimedia (videos, etc.) • Instrument anchored on the Philippines' National Risk Reduction and Management Plan for 2011-2028 guidelines. • Evidence-based education sessions utilized (e.g., pre-typhoon procedures, during typhoon procedures, post-disaster procedures • Statistical analysis is readily available
Theory/Evidence	• Effectiveeness of online education programs [10]–[13] • Proof of concept study—participants' feedback [14], [15] • Emergencies: World Health Organization Role [16] • Disaster risk reduction: Sustainable Development Knowledge Platform [7] • Climate Risk Profile: Philippines [17] • Analysis, Design, Development, Implement, and Evaluation (ADDIE) model [18]–[21]
Benefit for Individuals	• Accessibility is simple and adaptable • Inclusive • The program is "purpose-built" and highly usable • Appropriate identification of needs • Best fit intervention • High effectiveness in enhancing knowledge and skills in typhoon mitigation
Benefit for NDRRMC	• Asserting diversity in the many educational session services for individual assistance on typhoon mitigation. • Fit-for purpose

Table 2. ADDIE (Analysis, Design, Development, Implementation, and Evaluation) model

Analysis	• The participants are the general public regardless of age, gender, educational, and socio-economic level. • After the program, the participants will answer the post-evaluation instrument. • The method used is pretest-posttest design and utilized an instrument based on the Philippines' National Risk Reduction and Management Plan for 2011-2028 guidelines.
Design	• The types of media that will be used are; Zoom video conferencing, Powerpoint, PDF files, and social media: (Odette Project). • The types of activities included are collaborative, interactive and based on participants' needs. • The program will be implemented using the ADDIE model and evaluated using the Kirkpatrick model. • Timeframe for each activity is 45 to 60 minutes. The schedule of the typhoon mitigation education session is based on the agreed-upon date and time of the participants.
Development	• The time frame will be checked if adherent concerning what has to be accomplished in terms of material per schedule as anchored on the workplan of the program. • The participants will be checked if they will contribute as per their capital capacity. • The materials will be produced up to the task of what they are intended.
Implementation	The Individual Reflection Guide (IRG) will be used to confirm that the participants are performing/applying the education sessions of the program. The IRG is a comprehensive reflection tool designed to aid participants in applying the program principles to their own setting. They will utilize this document to keep track of their observations from the online activities, self-assessments, and reflection questions throughout the study. Moreover, the IRG will provide a lasting record of their knowledge and suggestions for improving their knowledge, attitude, and practices following the typhoon mitigation program.
Evaluation	To assess the program's effectiveness, participants will complete a post-study and an evaluation instrument based on the Kirkpatrick model.

1.2. Conceptual framework

Disaster risk reduction (DRR) is an essential aspect of social and economic development, and it is required if progress is to be long-term. Several international disaster risk reduction and sustainable development treaties have acknowledged this [7]. As the first primary global framework for disaster risk reduction, the Yokohama Strategy and Plan of Action for a Safer World (1994) recognized the link between sustainable development and Disaster Risk Reduction.

The United Nations' 2030 Agenda for Sustainable Development acknowledges and underscores the urgent need to reduce disaster risk. There are specific chances to meet Sustainable Development Goals by reducing disaster risk and direct references to the findings of the Third UN Conference on Disaster Risk Reduction (Sendai Framework). For example, limiting the poor's exposure and vulnerability to disasters or constructing disaster-resistant infrastructure. Even if disaster risk reduction isn't explicitly stated, various SDGs and targets can help reduce disaster risk and increase resilience, such as disaster mitigation programs and policies [6], [7], [22].

The Philippine Disaster Risk Reduction and Management (PDRRM) Act, or Republic Act 10121, was signed into law on May 27, 2010, paving the way for the need to "adopt a disaster risk reduction and management approach that is holistic, comprehensive, integrated, and proactive in lessening the socio-economic and environmental impacts of disasters, including climate change, and promote the involvement and participation of all sectors and all stakeholders concerned, at all levels."

The Act mandates the creation of policies and plans, as well as the implementation of actions and measures, for all aspects of disaster risk reduction and management, including good governance, risk assessment and early warning, knowledge building, and awareness-raising, reducing underlying risk factors, and preparedness for effective response and early recovery [23].

Education is a fundamental part of an overall typhoon mitigation program; it provides participants with the knowledge and skills they need to become resilient during a disaster such as a typhoon [8]. Developing the best possible education on typhoon mitigation is vital.

The online typhoon mitigation program is designed using the Analysis, Design, Development, Implementation, and Evaluation (ADDIE) approach. ADDIE is a framework for instructional systems design (ISD) utilized by many instructional designers and training developers for creating courses [20]. The analysis phase defines instructional challenges and objectives, the learning environment, and the learner's prior knowledge and skills. The analysis phase addresses several questions, including the following: 1. Who are the learners, and what are their characteristics? 2. What is the new behavior that is desired? 3. What are the many forms of learning constraints? 4. What delivery alternatives are available? [19]. The design phase encompasses the development of learning objectives, assessment tools, activities, material, subject matter analysis, lesson planning, and media selection.

The Kirkpatrick Model will be used to evaluate the online disaster mitigation program. It is probably the best-known model for analyzing and assessing the results of training and educational programs [24]. It considers any informal or formal training style to determine aptitude based on four criteria levels. L*evel 1 Reaction* measures how participants react to the activity (e.g., satisfaction?). *Level 2 Learning* analyzes if the students truly understood the program (e.g., increase in knowledge, skills, or experience?). *Level 3 Behavior* looks at if they are utilizing what they learned at work (e.g., change in behaviors?). *Level 4 Results* determine if the material positively impacted the participants.

Furthermore, the Kirkpatrick Model is a widely accepted method for assessing the effectiveness of training and development initiatives. It ranks both formal and informal training approaches on four dimensions: reaction, learning, behavior, and results [24]. The first criterion is "reaction," which indicates if learners found the training entertaining, beneficial, and applicable to them. This level is frequently determined using an after-training survey in which students rate their experience. A critical component of Level 1 analysis is the learner's perspective instead of the trainer's. While it may seem natural for a facilitator to focus exclusively on the training outcome (such as the content or learning environment), the Kirkpatrick Model advocates for survey questions that focus on the learner's takeaways [25].

Level 2 assesses each participant's learning by determining whether they gained the desired knowledge, skills, attitude, confidence, and dedication to the course. Evaluation of learning can

occur in formal and informal settings and should include pre-and post-learning evaluations to determine accuracy and comprehension. Exams or interview-style evaluations are used as assessment methods. A clear scoring process must be established in advance to avoid inconsistencies [24].

Level 3 is a critical step in the Kirkpatrick Model because it determines whether the learning impacted participants and whether they are applying what they learned. Assessing behavioral changes enables determining whether the skills were understood and logistically feasible to apply in the participants' setting. Often, analyzing behavior reveals problems in the participants' setting. A lack of behavioral change does not necessarily indicate that training was useless; it may suggest that the current processes and cultural factors do not provide an optimal learning environment for the desired change [25]. Level 4, on the other hand, is dedicated to evaluating immediate results. Level four assesses learning in relation to an outcome [24], [25].

Utilizing the Kirkpatrick Model leads to an actionable measuring plan that clearly defines objectives, quantifies results, and identifies areas of significant influence [24]. Analyzing data at each level enables one to assess the relationships to understand the training results, alter plans, and correct course during the learning process.

Table 3. Kirkpatrick evaluation model

Evaluation Category	Trainer	Learner
Program Objectives	Were the project objectives: 1. clearly defined? 2. covered by the trainer?	1. Did I understand the program's objectives? 2. Was I able to relate each learning objective to the learning I achieved?
Course Materials	1. Were the materials the right level of complexity for the trainer's background? 2. Were the materials well-organized? 3. Were the materials completed to the course content?	1. Was I appropriately challenged by the course material? 2. Is the course materials easy o navigate? 3. Did you feel that the course materials will be essential for you?
Content Relevance	Was the material relevant to the trainer's needs?	Will you be able to apply what you have learned from the program immediately?
Facilitator Knowledge	1. Did the facilitator demonstrate a good understanding of the material? 2. Did the facilitator share his/her experiences regarding the content?	1. Was your learning enhanced by the knowledge of the facilitator? 2. Was your learning enhanced by the experiences of the facilitator?

2. Materials

2.1. Development and evaluation

The World Health Organization defines a disaster as "a serious disruption of a community's or society's functioning, resulting in widespread human, material, economic, or environmental losses that exceed the affected community's or society's ability to cope using its own resources, necessitating a request for external assistance at the national or international level" [16]. Natural disasters cannot be avoided, but their life-threatening consequences can be avoided or minimized.

As a result, Disaster Risk Reduction Management knowledge is essential for local government officials who serve as leaders in their communities and are responsible for DRRM initiatives. The Philippines' National Disaster Risk Reduction Management Plan has four thematic areas, each with its own set of objectives. The four categories are disaster prevention and mitigation, disaster response, and disaster rehabilitation and recovery. The strategy intends to improve the national and local governments' capabilities to make Filipino communities safer and more resilient [26]. As a result, being aware of the mandate and willing to implement it may benefit communities by reducing the damaging consequences of disasters and increasing their capacity to respond in the event of a disaster.

The council established the National Disaster Risk Reduction and Management (NDRRM) Framework in June 2011 in accordance with Republic Act 10121, intending to create "Safer, Adaptive, and Disaster-Resilient Filipino Communities for Sustainable Development" [23]. The NDRRM Framework represents a paradigm shift in disaster management toward a proactive and preventive strategy. According to the conceptual representation, resources invested in catastrophe prevention, mitigation, preparedness, and climate change adaptation will be more effective in achieving the aim. The framework demonstrates that mitigating the potential impacts of existing disaster and climate risks, preventing hazards and minor emergencies from becoming disasters, and being prepared for disasters will significantly reduce the number of people killed and the damage to social, economic, and environmental assets. It also emphasizes the importance of effective and coordinated humanitarian assistance and disaster response to save lives and protect the most vulnerable people during and after a disaster. Furthermore, better rebuilding after a disaster will contribute to long-term development following the recovery and reconstruction process [27].

Typhoons may wreak havoc along coasts and hundreds of miles inland. They can generate gusts of up to 155 mph [28]. It can also cause storm surges near the shore and significant flooding from heavy rain. Floods and flying debris caused by high winds are expected to be fatal and devastating consequences of these weather phenomena. Slow-moving typhoons that make landfall in mountainous areas are known for dumping rain. Landslides and mudslides can be triggered by excessive rain. Intense rainfall can cause flash floods [29]. Thus, implementing emergency management is essential in typhoon mitigation.

The cornerstone of emergency management is disaster mitigation. It's a never-ending effort to mitigate the effects of natural disasters on people and property. Mitigation measures include keeping homes out of floodplains, building earthquake-resistant bridges, establishing and enforcing appropriate building rules to safeguard property from typhoons, and more [30]. "Sustained activity that minimizes or eliminates long-term danger to people and property from natural hazards and their effects," according to the definition of mitigation. It refers to the

continual efforts at the federal, state, municipal, and individual levels to mitigate the effects of catastrophes on our families, homes, communities, and economy [31].

Implementing disaster mitigation programs and policies can ensure fewer communities are victims of natural disasters [2]. Mitigation methods, for example, can be used to fortify our homes so that our families and valuables are better protected from natural disasters such as floods, earthquakes, hurricanes, and other natural disasters. They can assist businesses and industries in avoiding facility damage and remaining operational in the event of a disaster. Mitigation technologies can be used to help hospitals, fire stations, and other vital service facilities stay open or reopen more rapidly after a disaster. Furthermore, mitigation efforts can reduce disaster losses and suffering, resulting in lower demand for money and resources [6].

Knowledge, attitude, and practices are essential in typhoon mitigation [32], [33]. Effective risk communication techniques require understanding the public's awareness of natural catastrophe hazards [34]. Many studies have recently focused on the public's understanding and perception of natural catastrophe risk. According to Thomas et al. [35] studies, residents in typhoon-prone areas have a higher risk perception of a disaster than the general population. Furthermore, individuals' coping behaviors were linked to their risk perception and readiness knowledge [36]. Knowledge influences residents' attitudes and risk perceptions, influencing their coping actions [32]. Many individuals are aware of impending storms but are ignorant of their intensity or where they will make landfall [37]. There is also a lack of understanding about preparing for a cyclone [26], [35].

After a typhoon disaster, residents' awareness and coping behaviors have been linked to socio-demographic variables, particularly educational status, and economic conditions [38]. Because they live in comparatively less-developed and impoverished areas, rural residents are more exposed to typhoon disasters; their primary worry is the impact on their livelihood, which may lead to insufficient protection measures [32]. Rural inhabitants' risk perception and awareness of typhoons are also lower than urban residents, making them vulnerable [39]. As a result, the government built a personalized plan based on a deeper understanding of rural communities' risk perceptions and knowledge. There's also a need to look into the unknown aspects influencing how rural residents cope [34].

The KAP gap (knowledge–attitudes–practice gap) has been observed to impede rural residents' ability to implement practical adaptation actions [21], [35]. People may be aware of the impending calamity, but a reduced risk perception may influence their willingness to take precautionary measures [40]. Most individuals in disaster-prone areas know that they should prepare, but data reveals that only a tiny percentage do so. While inhabitants usually felt prepared for a typhoon disaster, it was discovered that there was still insufficient preparation in some circumstances [26]. Even those who have previously experienced a typhoon may not have taken proper typhoon preparation measures, increasing population susceptibility [32].

Strengthening the community’s typhoon mitigation planning and measures can provide accurate, relevant, and practical guidelines for typhoon mitigation. The proliferation of knowledge starts in each community. Consequently, the community should prioritize literacy on disaster mitigation, such as typhoons, for the world to deal with the issues mentioned above adeptly.

2.2. Validation of the typhoon mitigation program

Three specialists reviewed the program in typhoon mitigation (one university professor, one disaster risk management expert, and one nurse). The online typhoon mitigation program's outline was initially provided to a university professor for review and possible revision based on the topic's interest to the general public, the content's relevancy, and the information's ability to contribute to current knowledge [41].

Minor changes for improvement were complied with. The improved write-up was submitted to the disaster risk management expert and the nurse for more improvements. A series of online meetings took place to discuss their concerns, followed by their suggestions' compliance.

The discussions of three experts and researchers focus on the content to be presented as inputs to the participants and the questions asked in the questionnaire. After implementing the recommendations, these three experts approved the online typhoon mitigation for implementation.

2.3. Online typhoon mitigation program

The online typhoon mitigation program uses the analysis, design, development, implementation, and evaluation (ADDIE) model. The program topics are based on the adapted and contextualized from the Community Disaster Preparedness Handbook by the Department of Disaster Management (Virgin Islands), Weather Underground (owned by the Weather Company, a subsidiary of IBM), and the Tropical Cyclone and Typhoon Action Plan by the Liberty Specialty Markets, and the Philippines' National Risk Reduction and Management Plan for 2011-2028 guidelines. The topics include 1. rationale and significance of typhoon mitigation program, 2. community disaster preparedness, 3.a. pre-typhoon procedures (i.e., preparing an emergency kit, basic first aid, and securing food, flashlights, battery-operated transistor radio), 3.b. during typhoon procedures (i.e., securing a safe place and things to avoid during the typhoon), 3.c. post-disaster procedures (i.e., avoiding communicable diseases post-disaster scenarios, promoting health and well-being, and 'bouncing back'), 4. tropical cyclone and typhoon action plan checklist.

Moreover, the online typhoon mitigation program aims to provide participants with information on the rationale and significance of a typhoon mitigation program and discuss accurate, relevant, contextualized pre, during, and post-typhoon procedures.

Before the program starts, the participants will be informed that participation in the study is entirely voluntary and free from any form of undue influence. They will also be given enough time to decide whether to participate or not. Should they have any questions, they will be instructed to contact the lead researcher through email at any time. Additionally, they will be informed that the data gathered will only be for research purposes.

The lead researcher will deliver the four education sessions assisted by the co-researchers through Zoom. Teaching methods such as focus group discussions and dialogue sessions will be done during educational sessions through Zoom®. PDF pamphlets and Powerpoint® Slides will be provided. Duration is between 45 - 60 minutes—one session per week. The schedule will be arranged based on the agreed-upon date and time of the participants.

To ensure that the participants are doing/applying the typhoon mitigation-based interventions, the Individual Reflection Guide will be used. The guide is a comprehensive reflection tool that will assist the participants in applying the study's findings to their own context. They will use this document to capture their insights from the session activities, subjective assessments, and reflection questions throughout the study. Furthermore, the guide will serve as a lasting record of their learning and ideas from the education program.

Since the instrument is online-based, the researcher will ensure the participants' anonymity, store, and secure the data gathered with the help of the MIS and Computer Technology Department. After that, the retrieval, tabulation, computation, and interpretation of results developed findings, conclusions, and recommendations.

2.4. Fitness for purpose

The content of the typhoon mitigation program is available for the participants to access at their leisure. The instrument used in the study is adapted from Varona et al. [26], anchored on the Philippines' National Risk Reduction and Management Plan for 2011-2028 guidelines.
The questionnaire consisted of four parts. Part one is on the participants' socio-demographic data, part two consists of questions on the participants' knowledge regarding typhoon mitigation, part three is on the participants' attitudes towards typhoon mitigation, and part four is the activities on typhoon mitigation practiced by the participants. The questionnaire included 12 items. The subscale for knowledge consisted of 4 items. The highest possible point is 8. The scoring of each item consists of never heard of (0 point), heard of but never used (1 point), and heard of and know how to use (2 points).

Moreover, there are 4 items to measure attitudes, such as "typhoon mitigation is a great help to the community" and "learning about typhoon mitigation is necessary," which are rated with a 5-point Likert Scale (Strongly Agree, Agree, Undecided, Disagree, Strongly Disagree. These questions are followed by 4 items for practices related to typhoon mitigation, such as "follow accurate and timely advice to emergency response" and "conduct a typhoon risk assessment."

A pilot study will be conducted on 30 individuals not included in the study to ensure the questionnaires' clarity, using coherence and consistency tests. The questionnaire will then be revised in light of the individuals' comments. The instrument will be translated forward and backward. A language specialist will translate the scales' English version into Cebuano (a local dialect in the Philippines) and then into English by another expert. The nurse, a language specialist, and two university professors will review and finalize the translated items.

2.5. Target group and filtering processes

The online typhoon mitigation program is created with the general public in mind. The program addresses the critical need for Community Disaster Preparedness anchored on the Philippines' National Risk Reduction and Management Plan for 2011-2028 guidelines.

The program is geared toward individuals exposed to and at risk for natural disasters s uch as typhoons. However, individuals who are not exposed to typhoons but wish to improve their knowledge, attitude, and practices on typhoon mitigation may be drawn to the program due to its design that stresses practical procedures and solutions. The program is welcoming and accessible to those interested in pursuing such goals.

Numerous filtering methods have been implemented to guarantee that the individuals who require more assistance are delivered to the appropriate resources. Individuals may contact the researchers via email or phone when they need quick assistance. Regular monitoring is critical to the program's success. It ensured that individuals experiencing challenges are referred to more appropriate sources of help.

3. Discussion

3.1. Advantages for individuals

According to the World Health Organization, vulnerability is the inability of a population, individual, or organization to predict, cope with, resist, and rehabilitate after a disaster, and it includes vulnerable people such as children, pregnant women, the elderly, malnutrition, and people with disabilities [42], [43]. Numerous studies have endorsed the importance of disaster education to various classes of society at all levels [31], [44]. However, it is worth noting that people who are vulnerable due to their limitations and conditions need special training and attention with the help of trained and professional people [43].

According to research undertaken in various nations, including Japan, there is a direct correlation between education, higher risk perception, and individuals' risk mitigation efforts. Encouraging people to consider the importance of prevention and readiness can help close the gap between knowledge and action [7]. Today, disaster education should be addressed to increase resilience and knowledge dissemination to mitigate the danger of catastrophes occurring in their homes[45].

3.2. Advantages of online interventions in general

Apart from the benefits mentioned previously, which are unique to this program, the majority of online programs share several benefits, including 24/7 availability, accessibility via various devices like smartphones, computers, laptops, and the comfort of the user's personal space and chosen location [46].

Online access to assessment and intervention solutions eliminates communication barriers [14]. Moreover, the online typhoon mitigation program avoids a one-size-fits-all approach by allowing individuals to access educational materials on their own schedule.

3.3. Advantages to the National Disaster Risk Reduction and Management Council (NDRRMC)

Regarding NDRRMCs' benefits, the program will echo the council guidelines. Moreover, NDRRMC might be aided in raising the bar of education on typhoon mitigation. This can be accomplished through various training strategies, including this program explicitly designed for typhoon mitigation.

Additionally, many activities can be utilized to ensure correct planning, enhance an individual's knowledge and abilities, and evaluate an individual's performance under simulated settings. Additionally, the maneuvers and exercises utilized with vulnerable persons are different, and special care should be given to these individuals, even though these issues have received little attention. While typhoon mitigation education is helpful at all stages of a crisis, its impact is

greatest at the planning stage. As such, more educational planning should be done, which this program will address.

Lastly, NDRRMC can benefit from the statistical analysis of data gathered through the online typhoon mitigation program initiative. These data can provide insight into monitoring and gaining access to data on individuals' knowledge, attitude, and practices on typhoon mitigation. Moreover, such analytics can increase stakeholder accountability for budgeting and resource allocation. Similar online interventions for disaster risk reduction are cost-effective [6], [23]; consequently, these data can potentially result in a more efficient allocation of resources within the different governmental agencies.

3.4. Innovative features

Historically, innovation in typhoon mitigation, particularly concerning the use of technologies, has been urged [7], [16]. Utilizing evidence-based online programs to supplement face-to-face services has been hailed as an innovation in providing this need [6].

The program is distinct from other available programs because it will be delivered through multimedia. By contrast, the content of the other programs is heavily reliant on text. As mentioned previously, the program is based on the Community Disaster Preparedness Handbook by the Department of Disaster Management (Virgin Islands), Weather Underground (owned by the Weather Company, a subsidiary of IBM), and the Tropical Cyclone and Typhoon Action Plan by the Liberty Specialty Markets, and the Philippines' National Risk Reduction and Management Plan for 2011-2028 guidelines. The topics include 1. rationale and significance of typhoon mitigation program, 2. community disaster preparedness, 3.a. pre-typhoon procedures (i.e., preparing an emergency kit, basic first aid, and securing food, flashlights, battery-operated transistor radio), 3.b. during typhoon procedures (i.e., securing a safe place and things to avoid during the typhoon), 3.c. post-disaster procedures (i.e., avoiding communicable diseases post-disaster scenarios, promoting health and well-being, and 'bouncing back'), 4. tropical cyclone and typhoon action plan checklist, and specifically targeted to deliver a more effective learning process for the general public, especially the vulnerable groups and the marginalized sector of society.

Additionally, the individuals' feedback will influence the program directly. Most crucially, whereas other applications give all users the same pre-designed packages or modules for delivering online education sessions, the program tailors a solution to each individual's identified educational needs.

4. Conclusion

This article aims to explain an online typhoon mitigation program anchored on the Philippines' National Risk Reduction and Management Plan for 2011-2028 guidelines. The program is groundbreaking in numerous respects.

It addresses previously unmet needs by emphasizing practical and real-life typhoon mitigation procedures. The former is frequently an unrecognized concern. Simultaneously, the latter two have been disregarded due to the education gap among the general public, which is heavily focused on 'disaster' mitigation procedures.

Additionally, it prevents a one-size-fits-all approach and provides highly personalized educational sessions. In this regard, the program fits several of the aforementioned objectives

by providing accessible, practical, and real-life typhoon mitigation procedures. Its role is supplementary to the Philippines' National Risk Reduction and Management Plan for 2011-2028 guidelines.

It has been demonstrated that the program's conception and development are based on the best available evidence. Further empirical investigations should eventually help develop a solid evidence base for the program's usage in typhoon mitigation, resulting in widespread adoption throughout the different government sectors.

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Author Contribution
RTV and MLV conceived of the idea, developed the theory and performed the computations, verified the analytical methods, supervised the findings of this work. All authors discussed the results and contributed to the final manuscript.

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