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Design, Development and Evaluation of Universal Serial Bus on-the-Go (USB-OTG) Emergency Learning Kit in Teaching Disastr Readiness and Risk Reduction

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APPROVAL CERTIFICATE

This Master's Thesis titled, "*Design, Development, and Evaluation of Universal Serial Bus – On-The-Go Emergency Learning Kit in Teaching Disaster Readiness and Risk Reduction*" prepared and submitted by Levi James J. Arellano, in partial fulfillment of the requirements for the degree Master of Arts in Education major in General Science, has been examined and approved for Oral Examination.

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ABSTRACT

In times where disasters continuously threaten learning continuity, it is very important to provide innovative and accessible learning resources that can adapt to emergency situations and keep students engaged despite the disruptions. This study focused on the design, development and validation of Universal Serial Bus – On-The-Go Emergency Learning Kit in Teaching Disaster Readiness and Risk Reduction, a contextualized instructional material designed to ensure learning continuity amidst disaster-induced learning disruptions in the uplands of the northern region school in the garden city of the north. Amidst the challenges of disaster-induced learning disruptions, this research highlights the necessity of designing, developing and evaluating universal serial bus – on-the-go emergency learning kit to ensure learning continuity and contextualize DRRR concepts making more relevant for Filipino students. Utilizing research and development design, the study employed the Analysis, Design,

Development, and Evaluation (ADDE) Model reinforced with Taba's Grassroot Approach, in identifying the needs and with the guidance of the Cognitive Theory for Multimedia Learning (CTML), ensures that the instructional material was built upon the actual classroom needs and local environmental realities of the community. The study revealed that while learners have a basic awareness of Disaster Readiness and Risk Reduction concepts, there is a demand for improvement particularly on the analysis of disaster in different perspectives. The least learned competencies were identified using item analysis and used ADDE model as the framework for creating the material. Expert evaluation using the DepEd Learning Resource and Management System Evaluation Rating Sheet for Non-print resources resulted in "Passed" ratings across all factors. The result confirms that the Universal Serial Bus – On-The-Go Emergency Learning Kit in Teaching Disaster Readiness and Risk Reduction is a highly valid resource, ensuring learning continuity amidst disaster-induced learning disruptions. This research highlights the successful development of localized innovation in ensuring learning continuity amidst emergencies and disasters.

Keywords: *Disaster Risk Reduction Management, Universal Serial Bus on-the-Go (USB-OTG), Emergency Learning Kit, Developmental Research Design, Analysis, Design, Development, Evaluation Model.*

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DEDICATION

To my wife, Mary Ann J. Arellano, and my home, for the endless patience and quiet sacrifices that allowed me to pour myself into this work. Your unwavering belief in my potential is the strength that keeps me standing, and I am forever grateful for your love.

To my daughter, Aerith Harley, my life, who gives me the courage to keep moving forward, every page of this journey is dedicated to the bright future I dreamt for you.

To my parents, Eleazar M. Arellano Sr. and Nerissa J. Arellano, my first mentors and my lifelong shelter, for the unconditional love and prayers that have never wavered. Your faith in my dreams provided the wings I needed to reach this milestone, and I offer this achievement back to you with all my heart.

And to our Almighty Father, my constant source of wisdom, Your steady hand guided my thoughts and turned this vision into a reality that honors Your name.

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CHAPTER ONE
INTRODUCTION

The Philippines, located in the Pacific Ring of Fire, faces frequent natural disasters such as typhoons, earthquakes, volcanic eruptions, floods, and landslides, which disrupt children's education through school closures, damaged infrastructure, and logistical challenges (DepEd Order No. 012, s. 2020). These interruptions reduce instructional time, increase absenteeism, and hinder curriculum completion, exacerbating learning loss and dropout rates, especially in vulnerable, remote communities (UNESCO UIS, 2021; World Bank, 2024). The COVID-19 pandemic highlighted these issues, but natural calamities alone cause substantial annual disruptions, widening equity gaps due to unequal access to digital resources and blended learning.

Traditional remote learning fails in disaster zones due to unreliable internet, power outages, low device ownership, and teachers' limited digital skills (Esporas et al., 2021; Rathod, 2023; Ferri et al., 2020; Hodges et al., 2020). National policies like DepEd Order No. 012, s. 2020 (Basic Education Learning Continuity Plan), DepEd Order No. 022, s. 2024 (Learning Services, and Continuity Plans), and the Recommend Agree Perform Input Decide (RAPID) framework promote continuity via printed and broadcast modalities, but gaps persist in digital divides, teacher capacity, and equitable support for disaster-prone areas.

Various schools have implemented innovative solutions: UNICEF's "School-in-aBox" (2020) deploys portable kits with supplies for immediate learning resumption in emergencies; DepEd's "*EduKahon*" provides basic materials post-disaster; schools in typhoon-prone Tacloban (after Yolanda, 2013) adopted solar-powered radio classes through RBI, modules and printed self-learning packets; Leyte divisions used Universal Serial Bus flash drives with offline videos during blackouts; and international examples like Japan's "Disaster Preparedness Boxes" include laminated Disaster Readiness and Risk Reduction (DRRR) guides and simulation tools for offline use. These underscore the need for ready-to-use instructional materials, especially for DRRR, a science subject reliant on experiential learning. Universal Serial Bus – On-the-Go (USB-OTG) technology offers a solution by enabling offline access to digitized modules, videos, and interactive content on mobile devices, proving user-friendly in underserved areas (Jalandoon et al., 2023).

In a medium-sized division in Negros Island Region, Alternative Delivery Modalities (e.g., Zoom, Google Classroom) falter in geographically isolated areas with poor connectivity, necessitating portable, offline resources. In the upland schools of medium-sized divisions in Negros Island Region, learners suffer from online classes because of poor internet connection. A school-based survey revealed that, despite little to no internet access, Grade 12 Senior High School learners' own devices that can be used as learning resources. Out of 81 learners, 70 of them own a cellphone with a Type-C charging port. Eight learners do not have access to such a device; one student has no cellphone but owns a laptop, and two learners own devices that lack a Type-C charging port but are compatible with USB-OTG when connected to an adaptor. The researcher chose to develop a USB-OTG emergency learning kit because no studies exist on the design, development, and evaluation of USB-OTG-enabled Emergency Learning Kits (ELKs) for Senior High School DRRR in disaster contexts. This study addresses this by developing contextualized, offline modules, portable experiment kits, and aids aligned with resilience frameworks to ensure learning continuity amid disruptions.

➢ *Statement of the Problem*

This study aimed to design, develop, and evaluate the Universal Serial Bus-OnThe-Go Emergency Learning Kit in teaching Disaster Readiness and Risk Reduction to ensure learning continuity amidst disaster-induced and other learning disruptions.

Specifically, this study sought to answer the following questions:

- What is the needs analysis for developing the USB-OTG Emergency Learning Kit?
- What model could be used to design the instructional material?
- What could be developed to ensure the learning continuity amidst disasterinduced learning disruptions?
- What are the results of the evaluation phase to enhance the USB-OTG Emergency Learning Kit?

➢ *Framework*

This research draws on three interrelated theories that not only support but also help frame, implement, and assess the USB-OTG Emergency Learning Kits in teaching Disaster Readiness and Risk Reduction. The first is Resilience Theory. This theory explains how individuals, communities, and systems adapt, recover, and even thrive after exposure to adversity, such as crises, disasters, trauma, or emergencies. Though there are no main proponents for this theory, as this was developed over time, modern contributors like Masten (2001) and Mendenhall et al. (2019) describe this theory as patterns of positive adaptation in the context of significant adversity, particularly relevant for emergency education, where educators foster well-being pathways amid crises.

In the context of calamity-caused educational disruptions, constructivist principles explain the need for portable, interactive, and learner-centered instructional resources (Piaget, 1950). The USB-OTG Emergency Learning Kits provide digitized modules, experimental simulations, and video lessons that allow learners to continue building scientific understanding in a self-directed, experiential, and contextualized manner even outside the formal classroom setting.

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Vygotsky's concept of the Zone of Proximal Development (ZPD) (1930), informs the sequencing and scaffolding of the kit's learning materials for senior high school learners. The modules are organized from foundational concepts (such as basic hazard identification and risk awareness) to more complex applications (including disaster preparedness planning and risk reduction strategies), enabling learners to progress from what they can accomplish independently toward tasks that require guided support. Built-in prompts, guided questions, and model explanations embedded in the USB-OTG resources function as scaffolds that simulate teacher assistance, allowing learners to gradually achieve higher levels of understanding despite the absence of faceto-face instruction. These constructivist ideas serve as a direct source of inspiration for the content, the design of the tasks, as well as the activities and assessment.

- *Moreover, the Research is also Based on Resilience in Education and Learning*

Continuity Frameworks (UNESCO, 2020; UNICEF, 2021; Department of Education [DepEd], 2024), which emphasize three major issues: preparedness, adaptability, and access to learning during the times of crises. The frameworks stress the importance of solid systems, alternative delivery methods, and the use of flexible learning resources as a guarantee that education is going to survive and will be around even in the case of environmental, health, or infrastructural disruptions. According to DepEd's Learning and Service Continuity Plans (DO 022, s. 2024), schools should be equipped with the tools and strategies that would enable them to lessen the problem of instructional interruptions issue especially in the remote or disaster-prone areas. Also, the USB-OTG Learning Kits are consistent with those precepts as the instruments of resiliency which provide a dependable, offline manner of accessing instructional materials, thereby facilitating the continuation of learning even in situations where technology, connectivity, or school infrastructure are limited or are not available.

This study is also anchored on the Technology Acceptance Model. The Technology Acceptance Model (TAM) is a theory developed by Fred Davis in 1989 to explain how users accept and use new technology or innovation. TAM suggests that people are more likely to adopt a tool, system, or innovation if they believe that, the innovation helps improve performance or makes tasks easier and the innovation is simple, understandable, and convenient to use.

These theories have a combined effect of providing a clear basis for the research. They represent an interplay of pedagogy, technology, and crisis-responsive planning, which underpins the overarching goal of the study, the creation of the most effective, easily accessible, and locally relevant Emergency Learning Kits for Disaster Readiness and Risk Reduction .

This study is grounded on the ADDIE model framework. The ADDIE model is suited to design and developmental studies because it offers a systematic instructional design process built around analysis, design, development, implementation, and evaluation (Abuhassna, H., & Alnawajha, S. 2023). However, this model was modified into ADDE (Analysis, Design, Development and Evaluation) tailored to address educational disruptions in Disaster Readiness and Risk Reduction by creating a USB-OTG emergency learning kit. The study modified the traditional ADDIE model into

ADDE primarily due to practical constraints related to the research's scope and timeline. Specifically, the removal of the implementation phase was necessary because implementing and testing the emergency learning kit in actual emergency settings would require substantial additional time, resources, and a separate research effort. Modifying to ADDE is prevalent in agile edtech and prototyping, cutting timelines without sacrificing outcomes (McHugh & McCauley, 2020).

The framework emphasizes user-centered design, focusing on analysis of needs and competencies, design of instructional quality, development of multimedia elements to be included and evaluation of content quality, instructional quality, and technical quality for quality assurance.

The framework is structured as a cyclical model with interconnected phases, where each objective informs the next, ensuring the kit's relevance and impact. Below is a graphical representation of the framework, followed by a description of its components and relationships.

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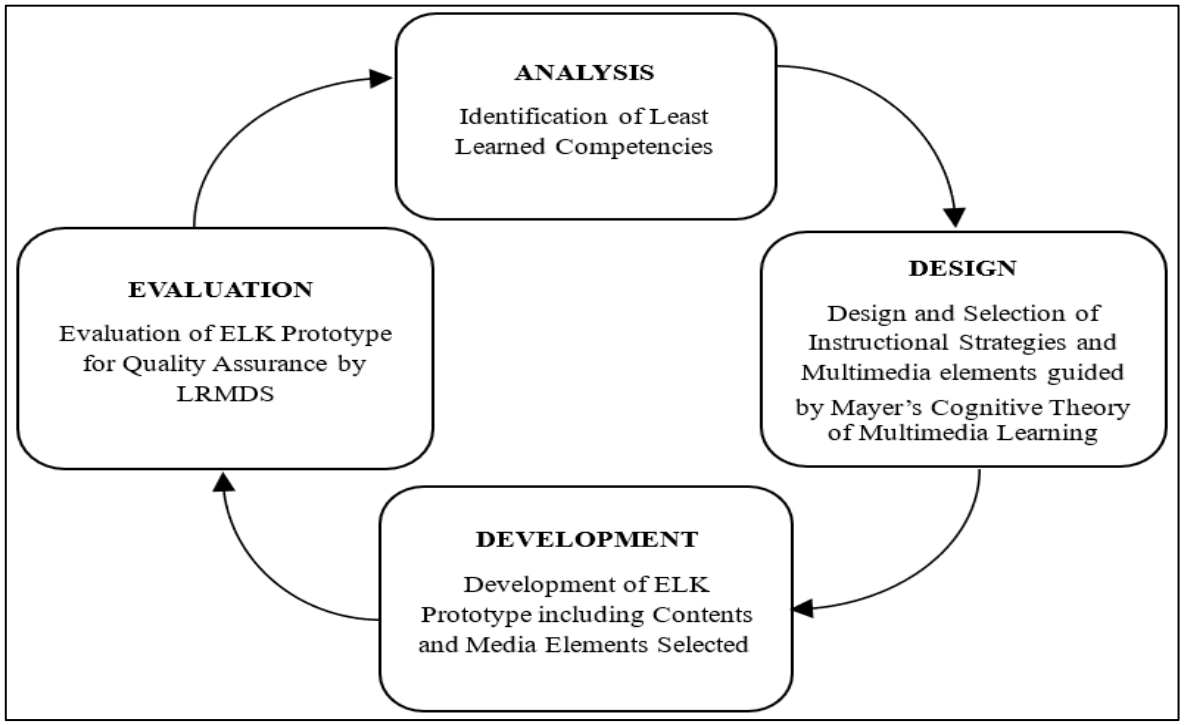

Fig 1 Conceptual Framework in ADDE Model

As shown in Figure 1, the framework illustrates how the USB-OTG ELKs are systematically created, refined, evaluated and validated as portable emergency learning kit in teaching Disaster Readiness and Risk Reduction (DRRR) during emergencies or when calamities strike halting face to face interaction. Each phase is interdependent, with evaluation feedback looping back into earlier phases to ensure a continuous cycle of improvement.

The process starts with Analysis phase, in which least learned competencies are identified. The least learned competencies were identified by the District DRRR Coordinator through collation of the top three least learned competencies of all schools in the district offering DRRR subject. The least learned competencies with the highest frequency will be ranked and only the top three will be included. Compilation and identification were done by the District DRRR Coordinator and noted by the Districts

Publics School's District Supervisor. These competencies are the consolidated least learned competencies from the District 8 Schools in the Division of Sagay City where most of the Senior High Schools in the uplands and are offering the subject are located.

Once the competencies are identified, the design phase follows which involves specifying instructional quality, selection of learning activities, multimedia elements, and assessment tasks aligned with DRRR content standards. Design decisions are anchored in constructivist principles such as learner engagement, active experimentation, and contextualized scenarios as well as resilience education frameworks that emphasize preparedness and adaptability. The selection process is mainly guided by Mayer's CTML (Cognitive Theory of Multimedia Learning). This blueprint clarifies how each module, video lesson, or interactive activity directly supports identified key competencies (e.g., hazard identification, risk assessment, community preparedness). The design phase also includes selection and creation of contextualized video lessons, learning activity sheets, PowerPoint presentations on the selected and identified learning competencies and assessment. These materials will undergo evaluation assessment for quality assurance.

During the Development phase, the selected instructional materials to be included as guided by the CTML are modules developed by DepEd Central Office, contextualized video lessons, researcher-made Power Point presentations and assessments. These multimedia elements are then compiled to create a prototype of the USB-OTG Learning Kit which will be subjected to Learning Resources Management and Development

- *System (LRMDS) using Evaluation Rating Sheet for Non-Print Resources*

The last Phase is Validation. During this phase, the Universal Serial Bus-On-The Go Emergency Learning Kit will be validated by the LRMDS personnel. This kit will be evaluated by LRMDS Chief, two instructional materials evaluators and an Education Program Supervisor for Content Quality assurance and a subject matter expert. The kit will be evaluated using the LRMDS Evaluation Rating Sheet for Non-print Resources for quality assurance in terms of Content Quality, Instructional Quality, and Technical Quality. The evaluation phase will determine if the prototype emergency learning kit meets the LRMDS standards.

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➢ *Significance*

This study is significant for several stakeholders, learners, educators, institutions, communities, and future researchers, by contributing both scholarly and practical value to the growing field of disaster-resilient education.

- *Learners*

The primary beneficiaries of this study are Senior High School learners, particularly those in disaster-prone and resource-limited communities. The results of this study may provide learners with continuous access to structured, self-paced, and offline

Disaster Readiness and Risk Reduction (DRRR) learning materials through USB-OTG Emergency Learning Kits. These resources may help learners sustain academic engagement during calamities, enhance disaster preparedness knowledge, and develop resilience despite disruptions to formal schooling.

- *Teachers*

The results of this study may provide teachers with relevant insights into the effective use of portable, offline learning technologies for emergency instruction. The findings may assist teachers in implementing flexible teaching strategies, facilitating selfdirected learning, and delivering DRRR content even when face-to-face classes or internet-based platforms are unavailable.

- *School Administrators*

This study may benefit school administrators and education authorities by providing evidence-based guidance on integrating USB-OTG Emergency Learning Kits into school disaster preparedness and learning continuity plans. The findings may support informed decision-making related to resource allocation, policy formulation, and the development of institutional protocols for emergency learning delivery.

- *Parents and Communities*

Parents and community members, especially those in remote and disaster-affected barangays, may benefit from this study through strengthened assurance that learning can continue at home during emergencies. By supporting sustained DRRR education, the study contributes to improved disaster awareness, community preparedness, and collective resilience.

- *Curriculum Developers and Education Program Supervisor in Science*

The findings of this study may provide policymakers and curriculum developers with empirical evidence on the feasibility and effectiveness of low-cost, offline instructional solutions. These insights may inform the development of policies, guidelines, and curriculum frameworks that institutionalize flexible learning delivery modes for disaster-prone contexts.

- *Researchers*

This study may serve as a valuable reference for future researchers who intend to conduct studies related to the design, development, and validation of emergency learning materials and offline educational interventions. The findings and processes utilized in the development of the USB On-The-Go (USB-OTG) Emergency Learning Kit may provide insights into the application of instructional design models in creating accessible and technology-supported learning resources for Disaster Readiness and Risk Reduction (DRRR).

- *Future Researchers*

Future researchers may benefit from this study by using its findings, design framework, and methodological approach as reference materials for further investigations. The study may serve as a foundation for research on emergency learning systems, technology acceptance, and disaster-resilient education across diverse disciplines and settings.

➢ *Scope and Limitation*

This study focuses on the design, development, and evaluation of a USB On-The-Go (USB-OTG) Emergency Learning Kit in teaching Disaster Readiness and Risk Reduction as an offline intervention and supplementary learning material intended to support learning continuity during emergencies and calamities. The study is anchored on the ADDE Model, specifically covering the phases of Analysis, Design, Development, and Evaluation.

The scope of the study includes the conduct of a needs analysis to identify the least learned competency in Disaster Readiness and Risk Reduction, which served as the basis for the development of the learning kit content. It also covers the planning and organization of instructional materials, multimedia resources, and offline learning activities suitable for use through compatible digital devices. Furthermore, the study includes the evaluation of the developed non-print learning resource using the LRMDS Evaluation Rating Sheet in terms of content quality, instructional quality, and technical quality. The evaluation will be conducted by four (4) Learning Resource Management and Development System (LRMDS) personnel, while one (1) Subject Matter Expert (SME) in Disaster Readiness and Risk Reduction validated the accuracy and relevance of the content.

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This study is limited only to the design, development, and evaluation phases of the USB-OTG Emergency Learning Kit within the context of the LRMDS program. The study is confined to the identified least learned competencies and does not cover the entirety of the Disaster Readiness and Risk Reduction curriculum.

➢ *Definition of Terms*

Important terms in this study are defined to establish understanding and proper interaction between the researcher and the reader.

- *Alternative Delivery Modes (ADM)*

Alternative Delivery Modes (ADM) are flexible teaching and learning approaches implemented outside the conventional face-to-face classroom to ensure continuity of education during emergencies or situations where regular instruction is disrupted (Department of Education, 2020).

In this study, ADMs specifically refer to offline USB-OTG Emergency Learning Kits, printed modular materials, and pre-recorded video lessons used in Senior High.

School classes in Sagay City to provide learners with uninterrupted access to Disaster Readiness and Risk Reduction (DRRR) content when classroom or internet access is limited.

- *Disaster Readiness and Risk Reduction (DRRR)*

According to the Department of Education (DepEd) Philippines, Disaster Risk Reduction (DRR) is defined as the systematic process by which potential disasters are prevented through analysis and management of causal factors, aimed at reducing the vulnerability of at-risk communities and enhancing their capacity to withstand, respond to, and recover from the impacts of disasters (DepEd, 2012).

In this study, DRRR refers specifically to the Senior High School subject whose least-learned skills are included in the USB-OTG Emergency Learning Kits, facilitating both theoretical and practical learning for learners in Sagay City to address vulnerabilities during disaster-induced school closures and promote proactive educational strategies.

- *Disaster-Induced Learning Disruptions*

Disaster-Induced Learning Disruptions are interruptions to education caused by natural hazards, health emergencies, or other crises, often resulting in reduced instructional time, limited access to learning resources, and increased educational inequities (Grafton et al., 2021).

In this study, disaster-induced learning disruptions refer specifically to class cancellations or reduced instructional time in Physical Science for Senior High School learners in Sagay City due to typhoons, earthquakes, pandemics, or similar emergencies, which necessitate the use of USB-OTG Emergency Learning Kits and other Alternative Delivery Modes to maintain continuity of instruction.

- *Emergency Learning Kits (ELKs)*

Emergency Learning Kits (ELKs) are modular and adaptable learning materials designed to support continuous education during emergencies or disruptions, ensuring that learning can continue outside regular classrooms (Department of Education, 2024).

In this study, ELKs refer specifically to USB-OTG emergency kits containing digitized Physical Science modules, activity sheets, and offline video lessons developed for Grade 12 learners in Sagay City, aligned with DepEd's *EduKahon* project to facilitate both hands-on and theoretical learning amid infrastructure and connectivity limitations.

- *Least Learned Competencies (LLCs)*

Least Learned Competencies (LLCs) are learning competencies or skills that learners find most difficult to master, as evidenced by assessment results or performance data (Department of Education, 2020).

In this study, least learned competencies (LLCs) refer specifically to Disaster Readiness and Risk Reduction competencies selected for inclusion in the USB-OTG Emergency Learning Kits, ensuring priority learning outcomes for Senior High School learners in Sagay City during educational disruptions. The identified LLCs for this study include, analyzing disasters from different perspectives, physical, psychological, sociocultural, economic, political, and biological, differentiating among hazards, exposure, and vulnerabilities and explaining the relationship of the three to disaster risk, and recognize vulnerabilities of different elements exposed to specific hazards.

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- *Learning Continuity*

Learning Continuity refers to maintaining access to education and achieving learning outcomes during disruptions, ensuring uninterrupted academic progress (Department of Education, 2020).

In this study, learning continuity denotes the continued participation and advancement of Senior High School learners in Physical Science in Sagay City during disaster-induced school closures, facilitated through USB-OTG Emergency Learning Kits containing offline resources tailored to local challenges.

- *USB-OTG (on-the-Go)*

USB-OTG (On-The-Go) is a technology that enables direct data transfer between compatible devices without the need for a computer, supporting portable digital storage and access (Jalandoon et al., 2023).

In this study, USB-OTG represents a method of storing and distributing digital learning content such as modules, videos, and interactive materials at schools in Sagay City with limited connectivity, integrating seamlessly into USB-OTG Emergency Learning Kits to support DRRR instruction amid calamities.

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CHAPTER TWO
METHODOLOGY

This chapter includes research design, locale, participants, instruments, data collection and data analysis.

- *Design*

This study utilized a developmental research design, pedagogically framed by the ADDE model - Analysis, Design, Development, and Evaluation to design, develop, and evaluate USB-OTG enabled Emergency Learning Kits for Senior High School Disaster Readiness and Risk Reduction learners in select senior high schools. In particular, the ADDE framework is deemed fitting for this research because it provides an iterative cycle for designing, developing, and evaluating teacher-made learning tools that not only undertake meaningful pedagogical renewal but also provide practical applicability in contexts of disrupted learning due to emergencies or calamities when face to face option is unavailable.

- *Locale*

This study was conducted in a medium-sized school division in the Negros Island Region, Philippines. The division serves both urban and geographically isolated communities, where learners are vulnerable to disruptions caused by natural hazards and other emergencies. These challenges often affect learning continuity and limit access to internet-based learning modalities.

The locale was considered appropriate for the study based on a school survey in which, locality has access to mobile devices compatible with Universal Serial Bus-OnThe-Go (USB-OTG) technology despite limited internet connectivity. Such conditions provided a suitable context for the design, development, and evaluation of the USB-OTG

Emergency Learning Kit in teaching Disaster Readiness and Risk Reduction (DRRR). Furthermore, the identified least learned competencies in DRRR served as the basis for the development of the instructional materials included in the learning kit.

- *Participants and Other Sources of Data*

The participants in this study consist of LRMDS Chief, two LMRDS quality assurance evaluators, one LRMDS content quality assurance and one subject matter expert. The evaluation is needed to ensure that materials are appropriate for classroom use, aligned with learner needs, and suitable in terms of content, format, presentation, organization, accuracy, and recency of information. DepEd's official evaluation tools for reading resources say the process establishes standardized criteria, ensures consistency and fairness, and improves the quality and effectiveness of resources used in schools (DepEd Memorandum No. 064 s. of 2023).

- *Instruments*

The research instruments were designed to gather data that would guide the systematic development, implementation, and evaluation of the USB-OTG Emergency Learning Kit in Teaching Disaster Resilience and Risk Reduction (DRRR).

The tool used to identify the Least Learned Competencies (LLCs) is an item analysis of a teacher-made periodical test. In this context, the research instrument is the assessment itself, and the results are examined item by item to determine which competencies learners learned least. Item analysis identifies LLCs by looking at the frequency of correct and incorrect responses per item. The competencies linked to items with the lowest number or percentage of correct answers are treated as the least learned, because they show the greatest difficulty for learners. Once done with the assessment, Disaster Readiness and Risk Reduction Subject Teachers identified the least learned competencies based on the 3rd Grading Periodical Exam results using item analysis. Identified least learned competencies and ranked according to the number of the highest frequency count and submit a copy to the district subject coordinator for compilation. The district DRRR Coordinator then compiled and rank the least learned skills. The researcher secured the data from the DRRR Subject Coordinator in the form of List of Least Learned Skills document.

Evaluation for quality assurance rating in terms of content quality, instructional quality, and technical quality were done by the Learning Resource Management and Development System personnel and one subject matter expert using the LRMDS.

Evaluation Rating Sheet for non-print learning materials. The Learning Resource Management and Development System (LRMDS) Evaluation Rating Sheet for Non-Print Materials is a standardized quality assurance tool used by the Department of Education to assess the effectiveness and suitability of non-print learning resources for educational use. The tool evaluates materials based on four major criteria: Content Quality, Instructional Quality, Technical Quality, and Other Findings. It examines the alignment of content with DepEd learning competencies, instructional effectiveness, technical functionality, usability, and the presence of conceptual, factual, or grammatical errors. Using a four-point rating scale, the instrument ensures that learning resources meet established educational and technical standards before they are recommended for use in public schools.

To ensure that the USB-OTG Emergency Learning Kit meets DepEd standards for quality, the USB-OTG Emergency learning kit prototype is required to achieve a minimum rating of 3 (Satisfactory) on the LRMDS Evaluation Rating Sheet for NonPrint Materials across all major criteria, including content quality, instructional design, and technical soundness. A rating of 3 indicates

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that the learning resource adequately meets the standards for content quality, instructional quality, and technical quality. However, in terms of Other Findings (errors) the kit must have a perfect score of 4 in all areas. Any criterion rated below 3 would require revision and improvement before the prototype can be considered ready for wider use, thereby ensuring that the final product is both pedagogically sound and technically functional.

- *Validity*

The study utilized teacher-made periodical assessment which has undergone quality assurance by the school head and subject matter coordinator and DepEd's LRMDS Evaluation Rating Tool for Non-print Resources, that has undergone validity testing by the Department. Furthermore, evaluators provided comments, suggestions and recommendations for improving the instructional material as it is a part of the tool itself.

- *Reliability*

The instrument was not subjected for reliability testing since the LMRDS Evaluation Rating Sheet for Non-Print Materials is a standardized instrument.

➢ *Data Collection*

Prior to conducting this study, the researcher obtained permission from appropriate authority. The participants were given an Informed Consent Form detailing their participation and consent during the conduct of the research. The Universal Serial Bus – On-The-Go Emergency Learning Kit was developed following the ADDE Model. Analysis of needs by identifying the least learned competencies were done by the District DRRR Coordinator who ranked the least learned competencies from all upland schools in the whole district that offers the subject. and noted by the Public Schools District Supervisor of District 8. The researcher used Document Analysis from the data provided to identify the least learned competencies.

Using the LRMDS Evaluation Rating Sheet for Non-print Materials, four LRMDS personnel and one subject matter expert validated and determined the USB-OTG Emergency Learning Kit met the standards of LMRDS across all areas.

➢ *Data Analysis*

To analyze and identify the least learned competencies, the researcher employed documentary analysis from secondary data given and provided by the District Subject Coordinator in the form of a document containing the ranked list of Least Learned Competencies for 3rd Grading Period 2024-205. The LLCs were identified though frequency count. The competency with the highest number of errors were ranked to identify the top 3 LLC. This data served as the basis for creation of the emergency learning kit.

To analyze the quantitative data, descriptive statistical tools was employed. The mean was used to determine the overall level of quality for each evaluation criterion. This statistical tool is appropriate because the purpose of the quantitative analysis is to summarize, describe, and interpret evaluation results whether the kit passes the LRMDS Standards.

Table 1 Interpretation of Score in each Criterion of LRMDS Evaluation Tool

Criterion Factor	Maximum Points	Minimum Points to Pass the Criterion
Content Quality	40	30
Instructional Quality	40	30
Technical Quality	52	39
Other Findings	16	16

Table 1 shows the evaluation of the non-print material shall be based on the major factors of Content Quality, Instructional Quality, Technical Quality, and Other Findings using the LRMDS Evaluation Rating Sheet. Each factor shall be rated using a 4-point scale: 4 – Very Satisfactory, 3 – Satisfactory, 2 – Poor, and 1 – Not Satisfactory, while a rating of Not Applicable (NA) shall be treated as equivalent to 3. The scores obtained in each factor should be interpreted as either Passed or Failed. A factor shall be considered Passed if it receives an average rating to or higher than the minimum points to pass each criterion. On Content Quality, Resource must score at least 30 points out of a maximum 40 points to pass this criterion. On Instructional Quality, Resource must score at least 30 points out of a maximum 40 points to pass this criterion. On Technical Quality, Resource must score at least 39 points out of a maximum 52 points to pass this criterion. On Other Findings, Resource must score at least 16 points out of a maximum 16 points to pass this criterion. Conversely, a factor shall be interpreted as Failed if the average rating falls below the minimum point to pass each criterion. The material shall only be considered acceptable for implementation if all major factors obtain a passing rating. On the other hand, Other Findings factor which is related to errors should have a perfect rating in all criterions to be able to meet the LRMDS standards and obtain a passing rate.

➢ *Ethical Considerations*

In compliance with ethical guidelines set by the Philippine Health Research Ethics Board (PHREB), the researcher abides by its principles in conducting research.

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- *Social Value*

The research prioritizes social value by providing direct benefits to learners and teachers and sharing findings through school briefs. The aim of this study was to design, develop and evaluate an emergency learning kit via USB-OTG to ensure learning continuity amidst disaster-induced disruption of classes.

- *Informed Consent*

Informed consent ensured participants are fully aware of the study's purpose, their voluntary participation, withdrawal rights, and data handling procedures. The participants were informed that participation in this research is purely voluntary.

- *Risk and Benefits*

The participants had the autonomy to withdraw from the study. Participants will be given an ample amount of time to evaluate the learning kit properly.

- *Privacy and Confidentiality*

Privacy and confidentiality were maintained. Securing digital storage, and appropriate retention or destruction of data were also be established.

- *Transparency*

Transparency and justice were upheld through clear communication of funding, potential conflicts of interest, and equitable inclusion practices. Community engagement was fostered through consultation with proper authorities.

- *Qualification of Researcher*

Having completed the academic requirements for the Master of Arts in Education majoring in General Science, the researcher worked under the guidance of a research adviser and instructor. The guidance assured adherence to ethical standards and maintained the integrity of the study.

- *Justice*

To secure justice in this study, all scores during validation of LRMDS personnel were considered to avoid bias and discrimination.

- *Research Ethics Review*

This study has undergone Institutional Review by the institution and got a certificate of ethics clearance.

- *Post – Research Responsibilities*

The researchers commit to disseminating the study's findings through appropriate academic channels, ensuring that the results contribute to the improvement of disaster preparedness education. Additionally, the data collected will be stored securely and disposed of properly in accordance with PHREB guidelines, while the identities and responses of participants remain confidential even after the completion of the study.

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CHAPTER THREE
RESULTS AND DISCUSSIONS

This section presents, analyzes, and interprets the data gathered in the study in accordance with the specific objectives. The discussion is arranged in a systematic sequence beginning with the scores of the respondents to ensure they pass the criterion, and followed by evaluating the content quality, instructional quality and technical quality of the USB-OTG Emergency Learning Kit in Disaster Readiness and Risk Reduction using LRMDS quality assurance ratings. The results are discussed and interpreted using appropriate statistical tools and relevant literature to support the findings.

➢ *Needs Analysis for Developing the USB-OTG Emergency Learning Kit*

Table 2 Ranked List of Least Learned Competencies in Disaster Readiness and Risk Reduction for the 3rd Quarter SY 2024-2025

RANK	LEAST LEARNED COMPETENCY	CODE
1	Analyze disaster from different perspectives (Physical, Psychological, Socio-cultural, Economic, Political and Biological)	DRR12-Ia-1
2	Differentiate between hazards, exposure and vulnerabilities and explain the relationship of the three to disaster risk.	DRR12-Id-13
3	Recognize vulnerabilities of different elements exposed to specific hazards	DRR12-Id-12

Table 2 shows the list of ranked least learned competencies of the subject Disaster Readiness and Risk Reduction where the competency, Analyze Disaster from different perspectives (Physical, Psychological, Socio-cultural, Economic, Political and

Biological), ranked first and is considered as the most difficult competency followed by, Differentiate between hazards, exposure and vulnerabilities and explain the relationship of the three to disaster risk and Recognize vulnerabilities of different elements exposed to specific hazards in the third place. This list was compiled by the DRRR District Subject Coordinator based on the 3rd Grading Periodical Examination after item analysis was conducted by each subject teachers from different schools offering the subject matter.

The ranking of the least learned competencies suggests that learners need support in higher-order thinking, especially in analyzing disasters from multiple perspectives and in distinguishing hazards, exposure, vulnerability, and disaster risk. For the USB-OTGenabled Emergency Learning Kit, this means prioritizing the most difficult concept explanations, visual organizers, guided comparisons, case vignettes, and problem scenarios that connect DRR ideas to everyday situations and local events rather than relying on recall-based activities alone. Based on this ranking, development of an offline supplementary learning material in the form of Universal Serial Bus On-the-Go emergency learning kit for the most difficult learning competency is inevitable to ensure learning continuity amidst disaster-induced learning disruptions.

Moreover, Olores et al. (2023), reported that DRRM competency levels needed improvement, with the application of DRRM concepts identified as a key gap. On the other hand, Hung et al. (2021), Rahmawati et al. (2020), partly disagree with a fixeddeficit reading because disaster training, blended e-modules, experiential learning, and integrated disaster lessons significantly improved learners' disaster knowledge, preparedness, and critical thinking, showing that these competencies can be strengthened when instruction is contextualized and interactive.

➢ *Design of USB-OTG Emergency Learning Kit*

During the Design Phase, the development of the Universal Serial Bus On-the-Go (USB-OTG) Emergency Learning Kit (ELK) for teaching Disaster Readiness and Risk Reduction (DRRR) was primarily guided by Taba's Curriculum Development Model (Grassroots Approach), while the Cognitive Theory of Multimedia Learning (CTML) served as the basis for selecting and structuring the multimedia content to be included in the kit. These frameworks ensured that the USB-OTG ELK was not only curriculumaligned and learner-centered but also responsive to emergency learning situations where internet access and classroom instruction may be disrupted.

Taba's Grassroots Approach emphasizes that curriculum development should begin with the actual needs of learners and teachers rather than from top-down prescriptions. It promotes the idea that instructional materials become more effective when they are contextualized, practical, and based on real classroom experiences. This model is highly appropriate for the design of the USB-OTG ELK because the kit was intended to serve as an offline, accessible, and emergency-responsive learning resource for learners experiencing disruptions caused by disasters and crises. Since learners in such situations often face limited access to formal instruction, the material needed to be relevant, simplified, and grounded in their local realities.

The first step for this Approach is Diagnosis of Needs, where the researcher identified the specific learning difficulties of learners. This was done through document analysis of the data provided by subject teachers through a list of least learned

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competencies. The list of LLCs was based on learners' performance on their quarterly assessment and has undergone item analysis. Using frequency count, the subject teachers determined the least learned competencies (LLCs), particularly those with the highest number of incorrect responses and the lowest mastery level. These LLCs served as the basis for the development of the kit.

The second step is Formulation of Objectives, where the researcher developed learning objectives directly based on the identified least learned competencies. The objectives focused on improving learners' understanding of disaster preparedness, hazard identification, vulnerability assessment, and disaster response strategies. These objectives ensured that the instructional materials would directly address the learners' academic gaps.

The third step is Selection of Content, the researcher ensured that the learning materials included in the USB-OTG ELK were valid, significant, and appropriate for the learners' level and identified needs. The multimedia elements used to present the contents were guided by the CTML. The contents are simplified using clear language, localized examples, and practical scenarios that learners could easily relate to, such as floods, earthquakes, landslides, and fire incidents commonly experienced in their communities.

The fourth step is Organization of Content, where the selected multimedia elements are placed inside the USB-OTG. A folder is dedicated to each least learned competencies containing the selected multimedia elements and assessment.

The fifth step is Selection of Learning Experiences and Materials, where the researcher identified the most appropriate instructional resources to support learning. Since the study focused on developing an offline emergency learning kit, the researcher included narrated video lessons, digital modules, PowerPoint presentations, animated infographics, hazard maps, voice-over explanations, and self-check quizzes. These materials were selected to make learning accessible, interactive, and suitable even without internet connection.

The sixth step is Organization of Activities, where the researcher structured engaging and progressive learning tasks to strengthen understanding and application. The kit included digital activity sheets, situational analysis tasks through assessments and performance tasks. These activities were designed to move learners beyond memorization and encourage critical thinking, problem-solving, and practical application of DRRR concepts in real-life situations.

The seventh and final step is Evaluation, where the researcher assess the quality of the Emergency Learning Kit. The developed materials were subjected to expert evaluation based on content quality, instructional quality, technical quality and others.

Guided by the Cognitive Theory of Multimedia Learning, the kit should use concise narrated videos, labeled visuals, and segment-based explanations so that learners process information through both visual and verbal channels without overload. Lo et al. (2017), and Brahme (2016), stated that the design should also avoid unnecessary decoration, excessive text, and redundant narration, while emphasizing signaling cues, short chunks, and active learner processing. Based on this principle, the kit includes 3-to5-minute micro-videos, animated infographics, hazard maps, comparison charts, voiceover explanations, and short self-check quizzes that match each targeted competency. However, this competency has a wide range of topics to be discussed. To tailor the needs and to cover each topic for a more elaborative discussion, the researcher made a 10minute video to cover the entire topics.

According to Adonis (2020) and Sulistiyowati, (2018), the selection of supplementary materials to be included in the kit should support conceptual understanding and application, not just recall. Contextualized modules and materials with multiple representations have been shown to improve conceptual understanding because they connect abstract ideas to concrete situations and everyday life. For this reason, the kit should include digital activity sheet, power point presentations, digital modules and mini case analyses through digital assessment that lead learners from identification of hazards to interpretation of vulnerability and disaster risk in different perspectives.

- *Development of USB – OTG Emergency Learning Kit*

Identifying the most difficult learning competency with the highest rank during the Analysis Phase and after carefully selecting the multimedia elements to be included during the Design Phase, the development of the prototype Universal Serial Bus On-the-Go (USB-OTG) Emergency Learning Kit in teaching Disaster Readiness and Risk Reduction was undertaken through the integration and assembly of the selected instructional materials into an organized and offline-accessible digital package. This involved the creation and compilation of video lessons, digital modules, supplementary learning guides such as PowerPoint presentations, and assessment materials, ensuring full compatibility with USB-OTG-enabled devices. The prototype was structured in a logical learning sequence aligned with the prioritized competencies and designed to facilitate independent learning, conceptual understanding, and application of disaster preparedness concepts even in the absence of internet connectivity or classroom instruction.

The development of the USB-OTG Emergency Learning Kit was guided by the Cognitive Theory of Multimedia Learning (CTML), Constructivist Learning Theory, and principles of contextualized and offline learning design. CTML served as the primary guide in the production of multimedia materials by ensuring that words and visuals were meaningfully integrated to reduce cognitive load and enhance understanding through principles such as coherence, signaling, segmenting, and modality. Constructivist Learning Theory guided the inclusion of learner-centered activities such as problemsolving tasks, scenario-based exercises, and reflective

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questions that allow learners to actively construct understanding of disaster readiness concepts. In addition, principles of contextualized and offline learning were applied to ensure that all materials were suitable for learners in resource-limited and emergency situations, particularly through USB-OTG accessibility, low-file-size multimedia formats, and offline functionality. These frameworks ensured that the developed prototype meets the standards of LRMDS and are accessible even without internet connectivity or classroom-based instruction.

Fig 2 Image of the Protype Emergency Learning Kit

Figure 2 shows the physical image prototype of the USB-OTG Emergency Learning Kit developed for teaching Disaster Readiness and Risk Reduction (DRRR).

The kit is a portable, offline-accessible digital learning package designed to function without internet connectivity or classroom instruction. It features a USB-OTG-enabled storage device with a capacity of two terabytes, capable of accommodating large multimedia files including video lessons, digital modules, PowerPoint presentations, and assessment materials. The kit is structured in a logical learning sequence aligned with prioritized DRRR competencies, facilitating independent learning and conceptual understanding of disaster preparedness concepts. The prototype is specifically designed for use in resource-limited and emergency situations, ensuring accessibility through lowfile-size multimedia formats and offline functionality.

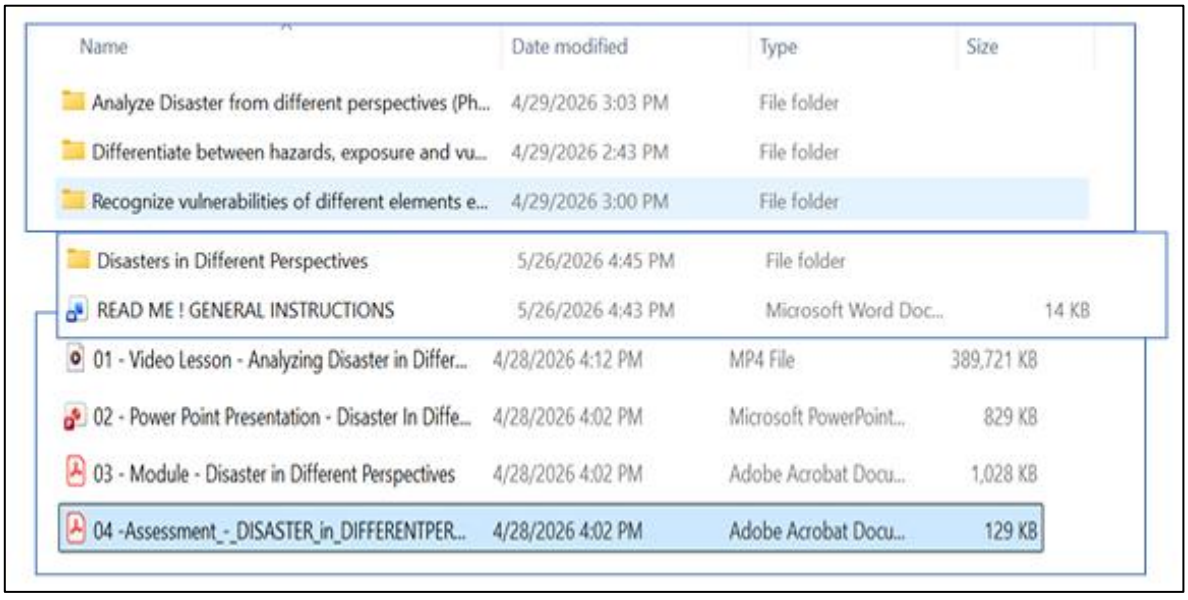

Fig 3 Image of the Selected Multimedia Elements and Supplementary Materials

Figure 3 shows the image of the contents of the USB – OTG Emergency Learning Kit when accessed. The selected multimedia elements and supplementary learning materials were labeled from 01-04 indicating the proper sequence of utilizing the learning materials. A general instruction is also included in the kit. The selected multimedia elements were labeled 01-04 indicating the proper sequence on these instructional materials should be utilized.

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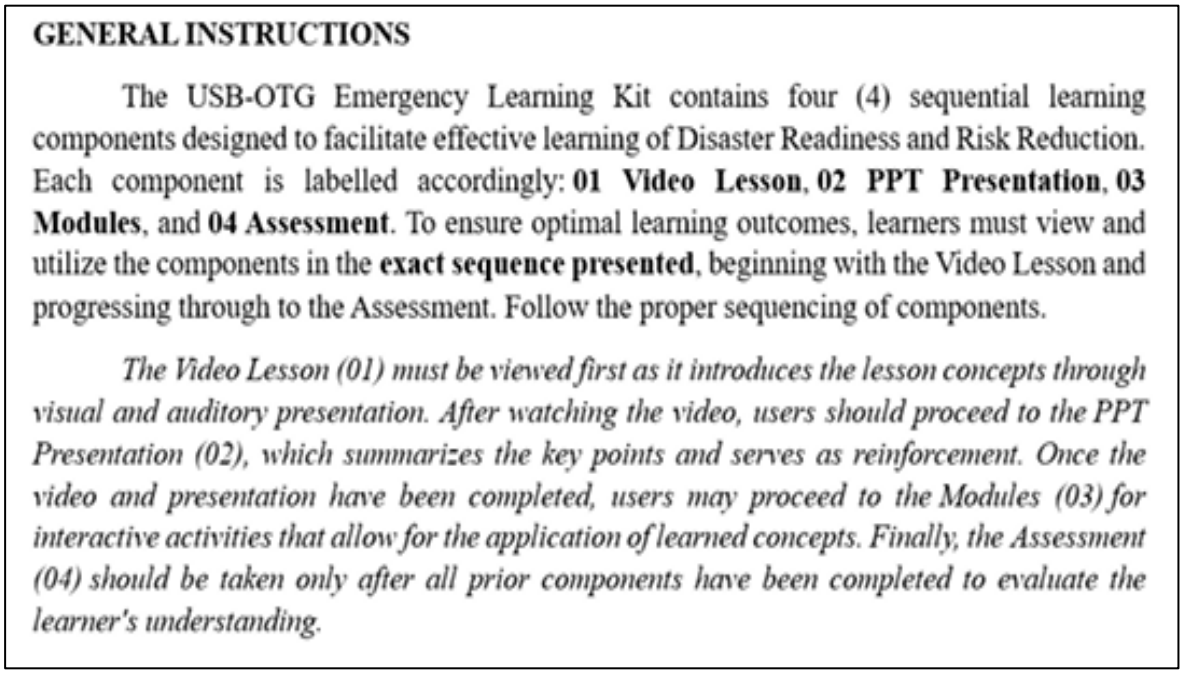

GENERAL INSTRUCTIONS

The USB-OTG Emergency Learning Kit contains four (4) sequential learning components designed to facilitate effective learning of Disaster Readiness and Risk Reduction. Each component is labelled accordingly: **01 Video Lesson**, **02 PPT Presentation**, **03 Modules**, and **04 Assessment**. To ensure optimal learning outcomes, learners must view and utilize the components in the **exact sequence presented**, beginning with the Video Lesson and progressing through to the Assessment. Follow the proper sequencing of components.

The Video Lesson (01) must be viewed first as it introduces the lesson concepts through visual and auditory presentation. After watching the video, users should proceed to the PPT Presentation (02), which summarizes the key points and serves as reinforcement. Once the video and presentation have been completed, users may proceed to the Modules (03) for interactive activities that allow for the application of learned concepts. Finally, the Assessment (04) should be taken only after all prior components have been completed to evaluate the learner's understanding.

Fig 4 Image of the General Instruction

Figure 4 shows the image of the General Instruction across all competencies when the emergency learning kit is accessed. It entails instructions on the proper sequence to ensure optimal learning. The General Instruction outlines a structured and sequential learning process intended to help learners effectively understand disaster preparedness concepts, risk reduction strategies, and emergency response procedures. It emphasizes organized, self-paced learning through carefully arranged instructional materials that work together to reinforce comprehension and practical application. The primary purpose of this instructional guide is to ensure that learners follow the materials in the correct order to maximize learning effectiveness. The document stresses that the sequence must not be altered because each component builds upon the knowledge and skills developed in the previous one. This sequential approach promotes better retention, clearer understanding of disaster-related concepts, and more meaningful engagement with the learning materials. Ragupathi et al. (2020), and Gomis et al. (2023), both believe that when assessment criteria and instructions are clearly communicated before the task, students experience lower levels of performance anxiety.

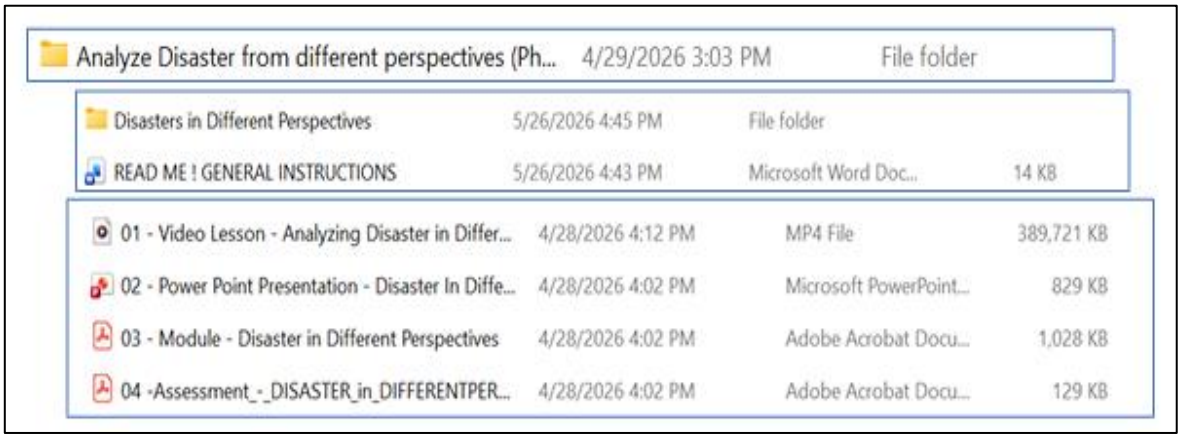

Fig 5 Image of the Selected Multimedia Elements and Supplementary Learning Materials for the First Ranked Competency

Figure 5 shows the image of the selected multimedia elements and supplementary learning materials for the first ranked competency which is Analyzing Disasters in different perspectives. The selected multimedia elements and general instruction is compiled in a folder inside the kit. The selected multimedia elements were labeled from 01-04 indicating the proper sequence of how the instructional materials should be utilized.

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Fig 6 Images from Video Lessons on Analyzing Disasters in Different Perspectives

Figure 6 shows screenshot images from the video lessons for the competency Analyzing disasters in different perspectives. This is a contextualized video lessons that uses recent disasters and emergencies that ravaged the locality. The video discusses disasters in different perspectives utilizing local events and calamities that the community had experienced. The purpose of this video is to provide a relevant and contextualized discussion on disasters in different perspectives utilizing local events for relevance and optimum learning. **:** Contextual videos in transcultural multimedia materials enhance students' cultural awareness and critical intercultural competency, which are essential for effective global communication (Herawati et al., 2025).

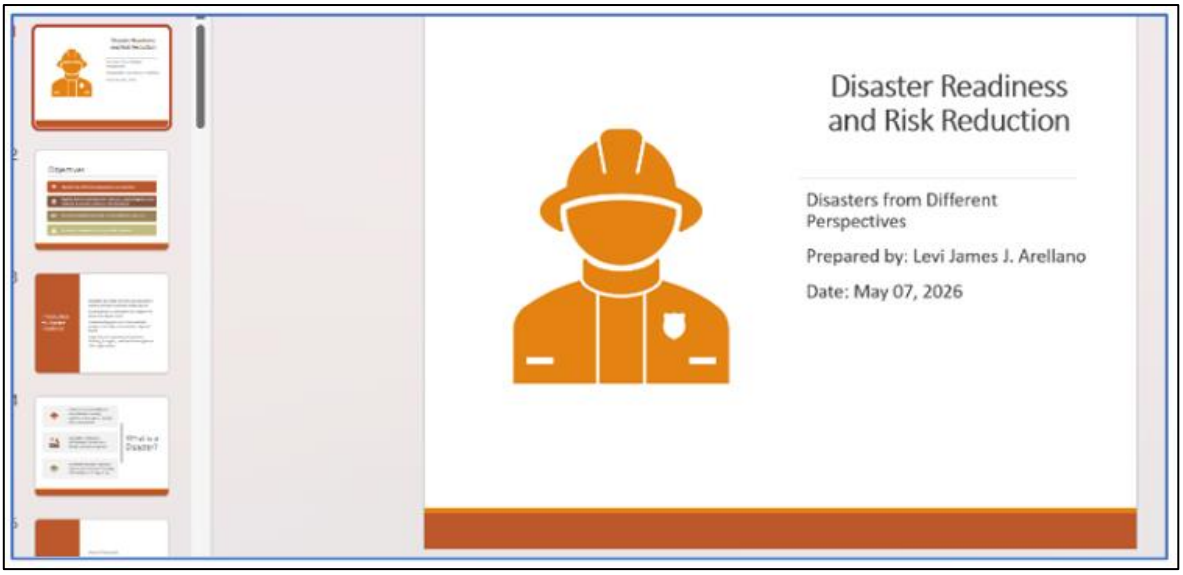

Fig 7 Image of Power Point Presentation for the Competency Analyzing Disasters in Different Perspectives.

Figure 7 shows the contextualized power point presentation of the competency, analyzing disaster in different perspectives. This presentation followed the NEAP guidelines and drew on local events and recent emergencies experienced by the local community. This presentation is an educational instructional material designed to introduce learners to the multidimensional nature of disasters and their impacts on communities. The presentation explores disasters through six major perspectives: physical, psychological, socio-cultural, economic, political, and biological. Through explanations, localized examples, photographs, and discussion prompts, the presentation aims to deepen learners' understanding of how disasters affect individuals, communities, governance, health, and livelihoods. The primary purpose of this presentation is to help learners build awareness, preparedness, and resilience helping them understand the topic by tackling the aftermath that affect society in multiple interconnected ways. It seeks

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to develop critical thinking by encouraging learners to analyze how various sectors of society respond to emergencies and how individuals can contribute to disaster preparedness and recovery. PowerPoint allows educators to incorporate text, images, animations, and videos into lessons, catering to diverse learning preferences and fostering a more engaging learning environment. Ozaslan and Maden (2013 as cited in Adawurah, 2025) states that visual elements such as colors, images, and animations capture students' attention and interest, making the learning experience more stimulating than text-only instruction.

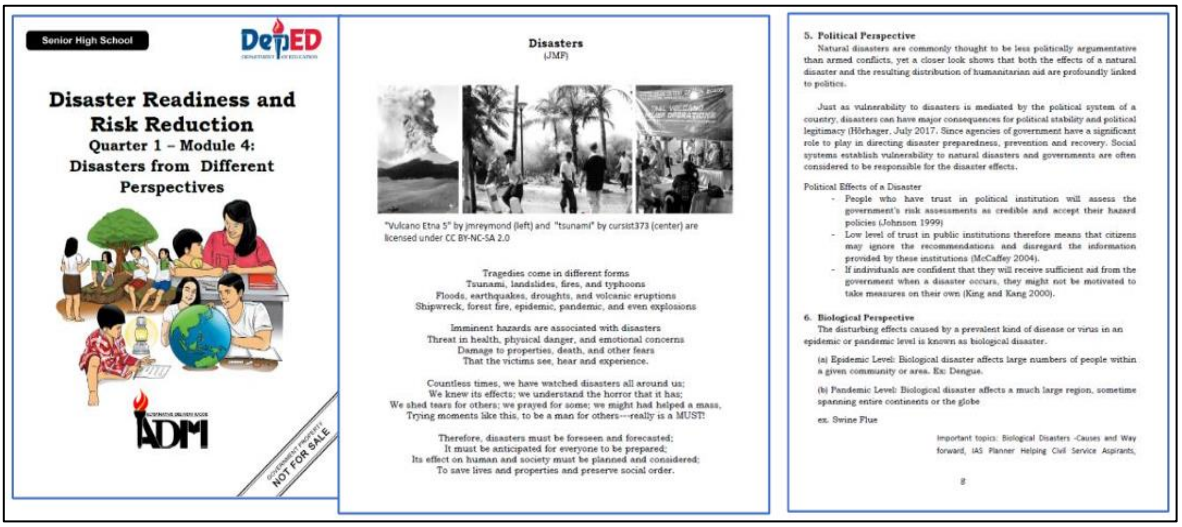

Fig 8 Images of the Module for the Competency Analyzing Disasters in Different Perspectives.

Figure 8 shows images of the module for the competency, analyzing disasters in different perspectives. This module is from the Central office and has undergone quality assurance for optimal learning. This module is a comprehensive self-learning instructional module designed to help learners understand the complex and multidimensional nature of disasters. Developed for the subject Disaster Readiness and Risk Reduction, the module provides structured lessons, activities, assessments, and reflective exercises that guide students in analyzing disasters from physical, psychological, socio-cultural, economic, political, and biological perspectives. It is specifically designed to support independent and guided learning while promoting critical thinking, preparedness, and community awareness. The module uses a learner-centered approach by incorporating varied activities that encourage reflection, analysis, and application of knowledge. Activities such as interpreting poems, analyzing disaster scenarios, answering situational questions, ranking community needs after disasters, and evaluating real-life events help learners connect theoretical concepts to actual experiences. Interactive digital modules specifically designed for math and science have been shown to significantly improve students' ability to solve complex problems compared to traditional textbooks (Tarigan et al., 2023).

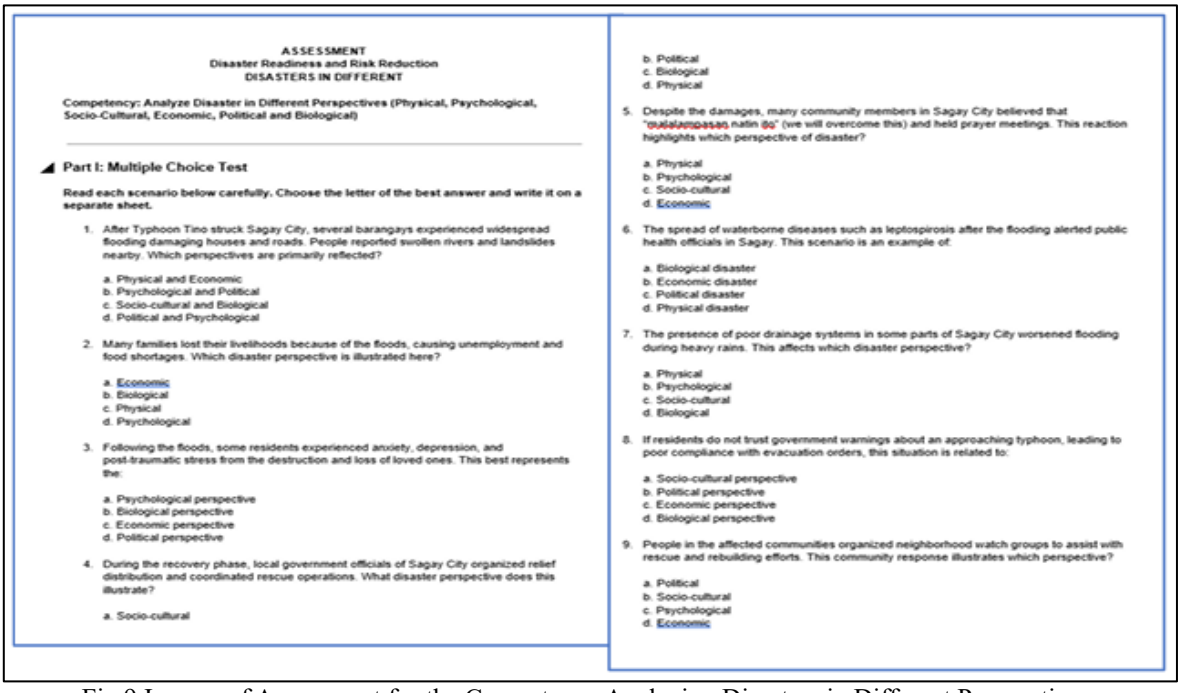

Fig 9 Images of Assessment for the Competency Analyzing Disasters in Different Perspectives.

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Figure 9 shows images of the assessment. This contextualized assessment made use of Higher Order Thinking Skills to promote higher learning outcomes. This assessment has two parts, the multiple choice and the performance with rubrics. The test items also used recent emergencies experienced by the local community. This assessment is designed to evaluate learners' understanding and analytical skills regarding disasters from multiple viewpoints: physical, psychological, socio-cultural, economic, political, and biological. The assessment should be answered lastly after the learner utilized the instructional materials included in the kit. The performance is an output-based assessment that assess learners understanding on the lesson. Assessment provides a measurable baseline for documenting knowledge, skills, and attitudes, allowing educators to track student development over time (Dilrabo, 2021).

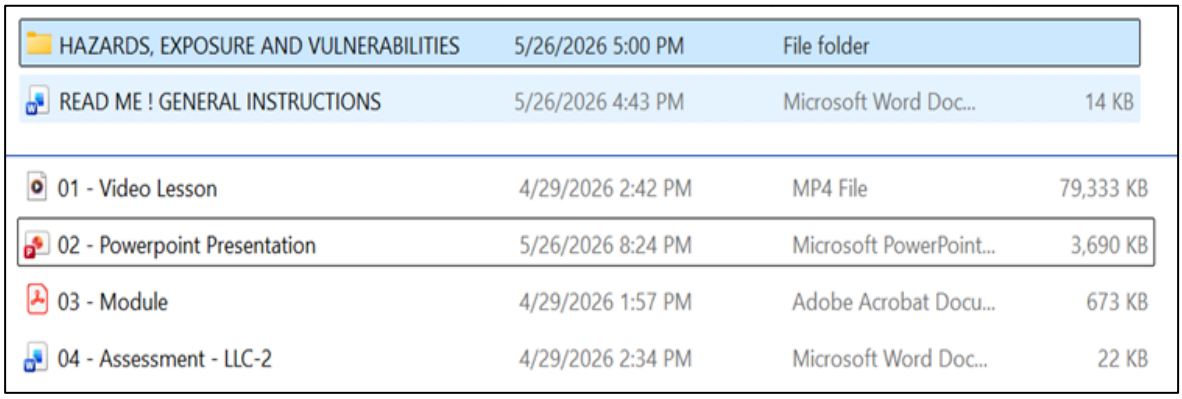

Fig 10 Image of Multimedia Content and Supplementary Learning Materials for Second Ranked LLC

Figure 10 shows images of multimedia content and supplementary learning materials when it is accessed. These multimedia elements are compiled inside a folder. The selected multimedia elements were labeled from 01-04 indicating the proper sequence of how it should be utilized.

Fig 11 Images of Video Lesson for Hazards, Exposure and Vulnerabilities

Figure 11 shows images of the contextualized video discussing about the difference among hazards, exposure, and vulnerabilities and explain the relationship of the three to disaster risk.

This contextualized video made use of the recent events and calamities that the local community had experienced recently. This contextualized video lesson tackles the difference between hazard, exposure and vulnerabilities. By providing examples through local events and calamities that the community had experienced, this video optimizes learners' comprehension. The purpose of this video is to explain in detail the difference between hazard, exposure and vulnerabilities using contextualized examples for relevance to promote understanding. Alsmari (2020), states that, exposure to authentic, contextualized video excerpts helps foreign language learners develop accurate sociopragmatic skills, such as producing appropriate complaints in real-world scenarios.

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Fig 12 Images of Power Point Presentation for Hazards, Exposure and Vulnerabilities

Figure 12 shows images of power point presentation for Hazards, Exposure and Vulnerabilities. This contextualized presentation made use of recent calamities that the locality had experienced. The examples used were pictures of the flash flood that had hit Sagay City on January 2026. This presentation presents the differences between hazard, exposure and vulnerability. The primary purpose of this presentation is to augment leaners understanding about the topic. This PowerPoint presentation is a supplementary tool that helps reinforce main instruction, making lessons more inclusive, dynamic, and effective. PowerPoint slides combine text with graphics, illustrations, and other visual elements, activating both the verbal and imagery systems of the brain. This dual-coding approach enhances comprehension, supports the encoding of information into long-term memory, and helps students construct mental models of complex concepts (Mayer, 2020).

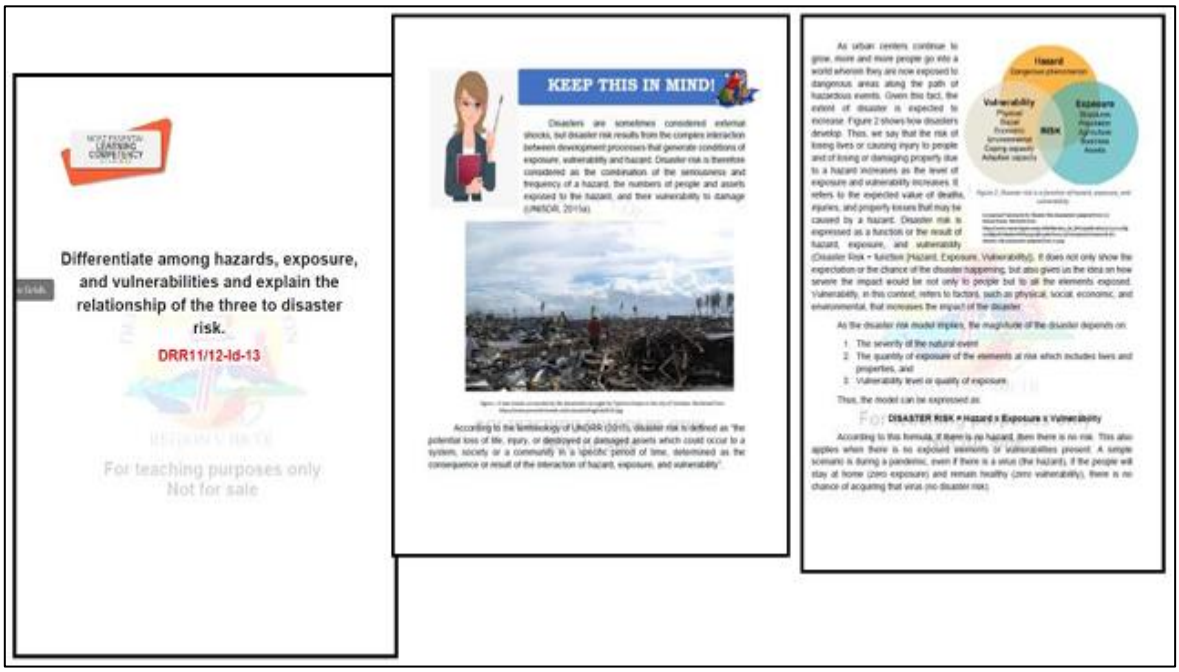

Fig 13 Image of Module for Hazards, Exposure and Vulnerabilities

Figure 13 shows images of the Module for Hazards, Exposure and Vulnerabilities. This module is from Central Office and is often as ADM. The modules discuss the difference of Hazards, Exposure and Vulnerability in the Philippine context. It provides the analytical foundation upon which all other emergency learning is built. Without understanding hazards, exposure, and vulnerabilities, learners cannot effectively interpret warnings, create preparedness plans, or respond appropriately during emergencies. It promotes proactive thinking that replaces fear with knowledge and confidence. This module serves to reinforce learning by complimenting other instructional materials included in the kit. Rusmini et al. (2023), states that digital modules act as independent digital books that allow students to study at their own pace, which proved essential during the shift to remote learning.

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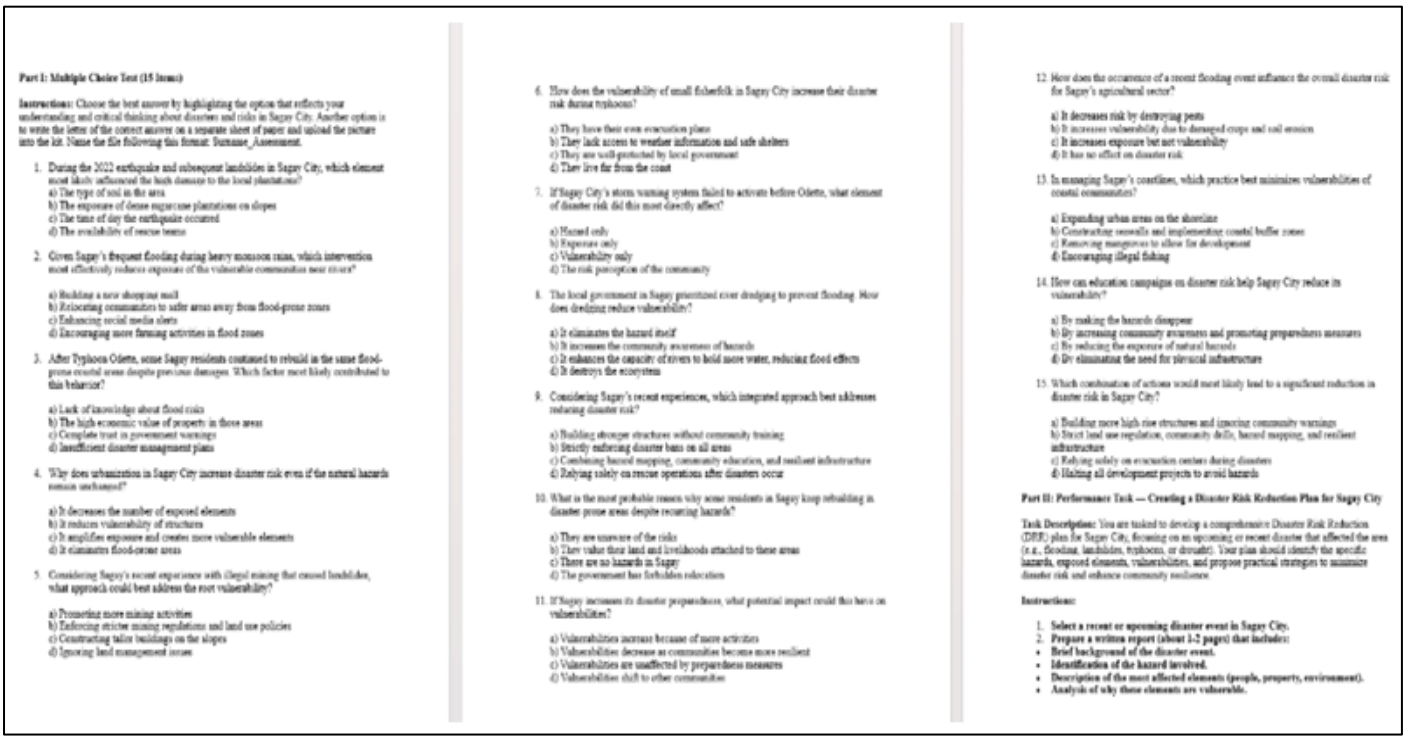

Fig 14 Images of Assessment for Hazards, Exposure and Vulnerabilities

Figure 14 shows images of the contextualized assessment. This assessment has two parts, the multiple choice and output-based performance task. A rubric is provided for the performance. This assessment made use of local events and examples for optimum learning. This assessment intends to measure learners' understanding of the lesson. The first part which is a 15-item multiple choice test will intend to test learners' analytical skills thereby promoting higher order thinking skills. The performance task in the assessment do not only intend to let students display their knowledge, skills and understanding but it also tests how they respond and analyze in a simulated emergency or real-world situation. Welldesigned assessments engage students more deeply with their learning process, shifting the focus from simply evaluating learning to supporting learning (Dilrabo, 2021).

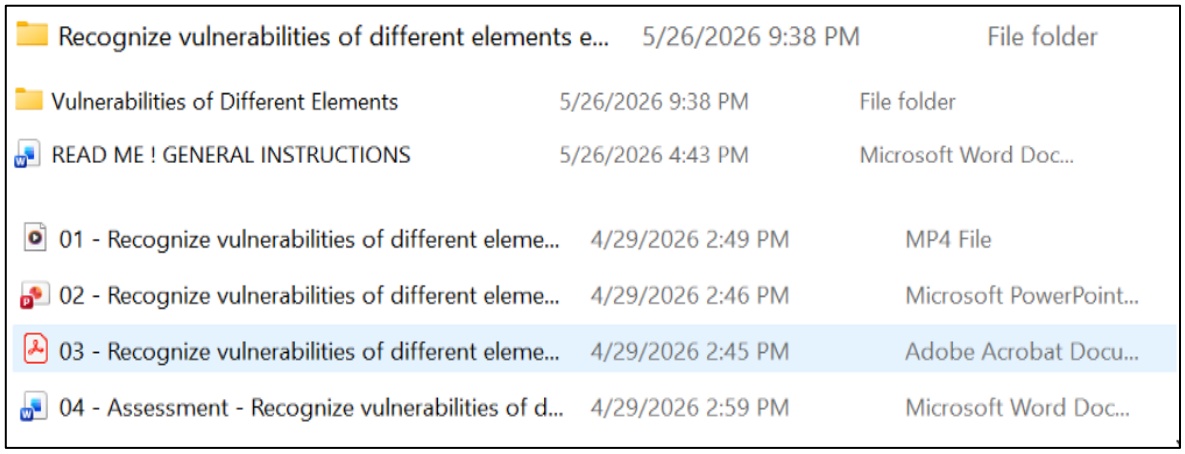

Fig15 Image of Multimedia Selection and Supplementary Learning Materials for Vulnerabilities of Different Elements Competency

Figure 15 shows images of multimedia elements and supplementary learningmaterials when USB-OTG Emergency Learning Kit is accessed. A general instruction file is included to guide learners on what to do. The selected multimedia elements are compiled inside a folder with labels 01-04 indicating the proper sequence of how these instructional materials should be utilized. The purpose of this labeling is to ensure an optimum learning environment.

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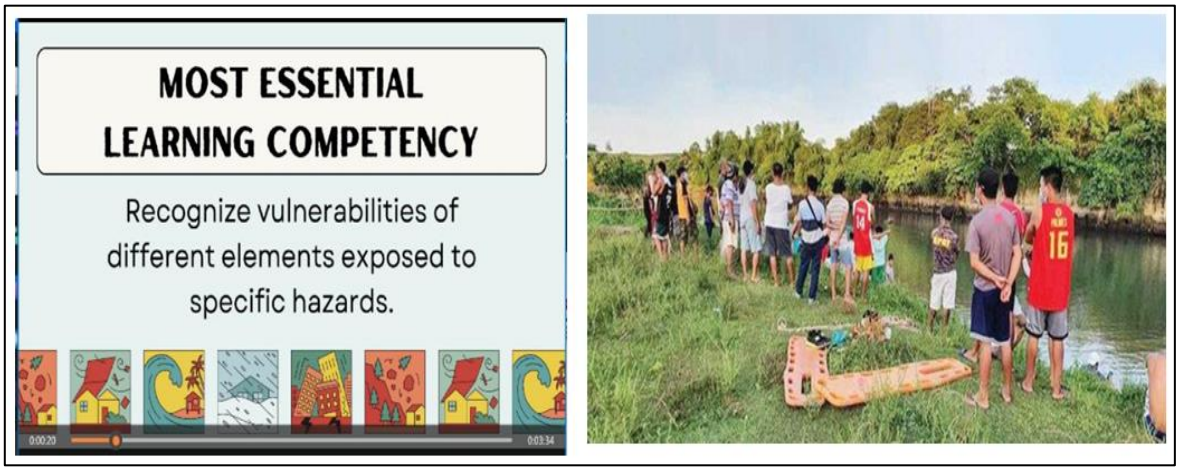

Fig 16 Images of Video Lesson for Vulnerabilities of Different Elements

Figure 16 shows images from the contextualized video lesson that tackles vulnerabilities in different elements. The video used local places, events and situations that the community had experienced recently. This video lesson is a contextualized instructional material designed to help learners understand how disasters and hazards affect various elements within a community. Decuna et al. (2025), states that, in technical and vocational education, contextualized video lessons have been found to significantly improve learner performance and skill acquisition compared to traditional lecture demonstrations. The video presents real-life and localized situations that demonstrate the vulnerability of people, properties, infrastructure, livelihoods, and the environment when exposed to hazards such as typhoons, floods, earthquakes, landslides, storm surges, droughts, and biological hazards. The lesson uses familiar community-based examples, practical scenarios, visual demonstrations, and relatable experiences to make the concepts more meaningful and easier for learners to understand. A key feature of the video lesson is its localization and contextualization. Community-based examples such as flooding in lowlying barangays, damaged crops during typhoons, and disease outbreaks after disasters allow learners to connect the lesson to real situations experienced within the local community.

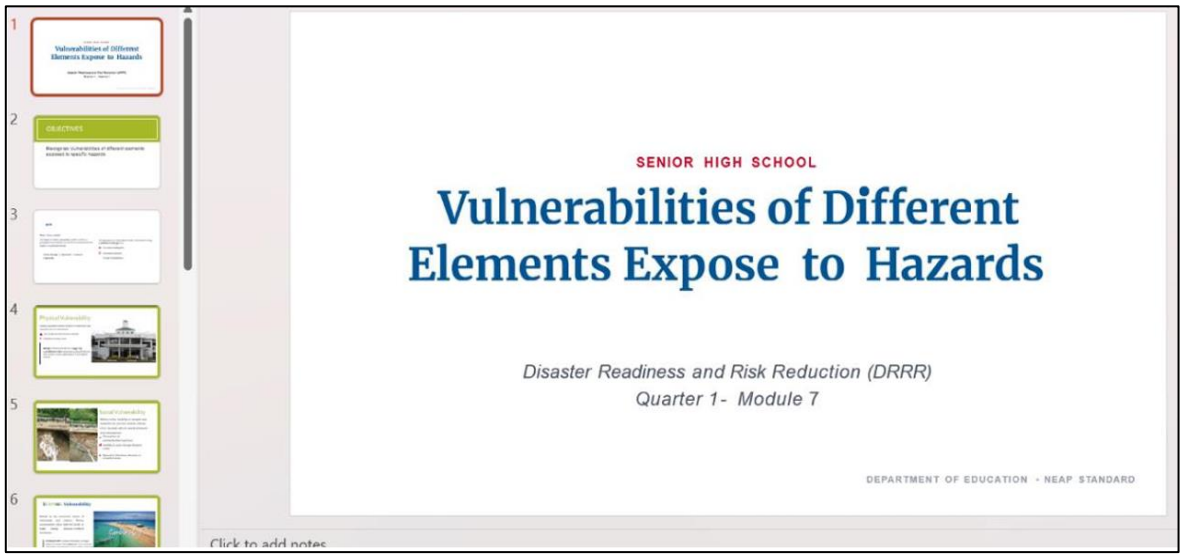

Fig 17 Images of PowerPoint Presentation for Vulnerabilities of Different Elements

Figure 17 shows the PowerPoint presentation images for recognizing vulnerabilities of different elements exposed to specific hazards. This contextualized presentation tackles the vulnerabilities in different elements using local places and events for optimum learning. This presentation aims to help learners understand the various types of vulnerabilities that elements such as physical structures, social systems, economic status, and the environment face when exposed to specific hazards. It explains how physical vulnerabilities involve infrastructure and population density, social vulnerabilities involve disruption in communication and services, economic vulnerabilities relate to a community's ability to afford protective measures, and environmental vulnerabilities result from resource depletion and ecological damage-. The presentation also highlights how quantifying vulnerabilities helps in planning mitigation and preparedness efforts. It uses the local community as a case study to illustrate high vulnerability due to geographical location, economic conditions, and social capacity. PowerPoint slides help students take notes more effectively during lectures and can serve as study resources for review outside of class. The visual summary provided by slides lowers the burden of note-taking during class, allowing students to focus more on understanding concepts rather than transcribing content verbatim (Axell et al., 2008).

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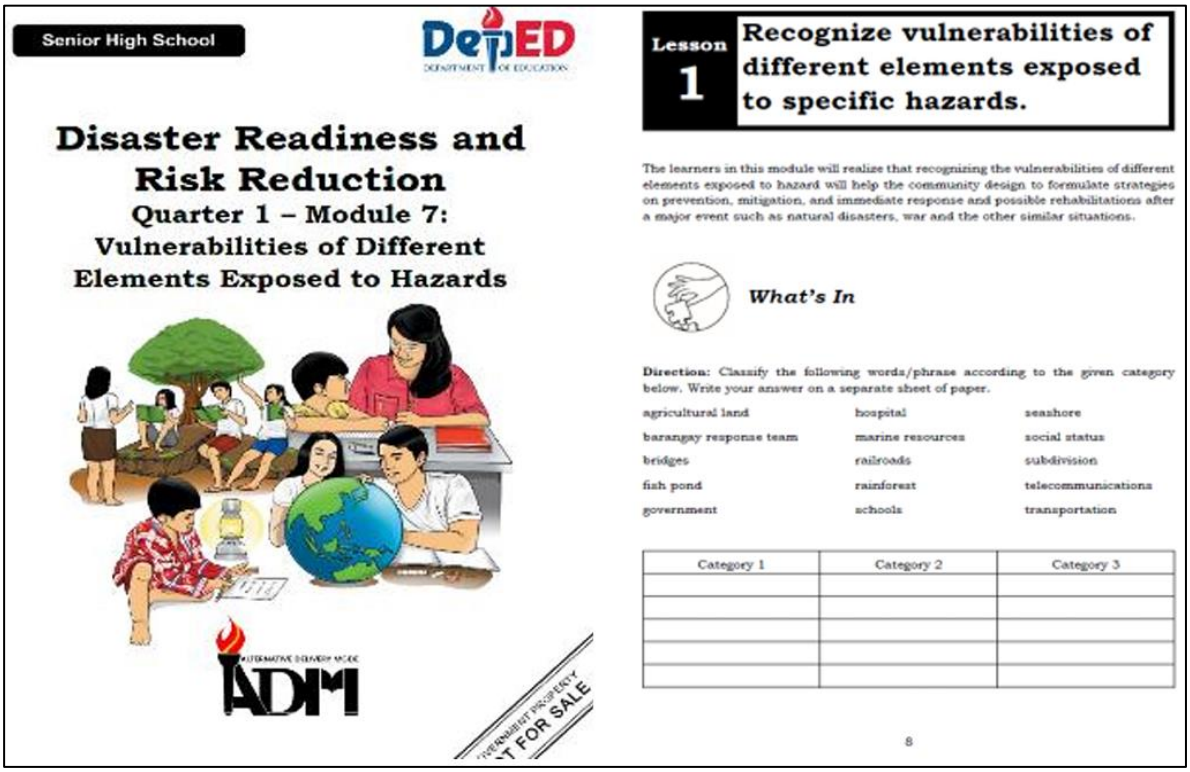

Fig 18 Image of Module for Vulnerabilities of Different Elements

Figure 18 shows images of the module for Vulnerabilities of different elements. This module on *Disaster Readiness and Risk Reduction* discusses the different vulnerabilities of people, communities, and environments when exposed to hazards. This module acts as a supplementary instructional material that aims to provide learners with a comprehensive understanding of how different elements such as people, infrastructure, livelihoods, environment, and communities become vulnerable when exposed to various hazards including typhoons, floods, earthquakes, landslides, and biological threats. The module presents contextualized discussions, activities, and real-life examples that help learners analyze disaster risks and identify practical preparedness and mitigation measures. It explains physical, social, economic, and environmental vulnerabilities through examples, activities, and assessments. Its purpose is to reinforce essential disaster preparedness concepts, develop critical thinking, and promote awareness of local vulnerabilities and risks. The material complements other components of the learning kit such as video lessons, presentations, and assessments by providing detailed explanations and interactive learning activities.

Malik et al. (2022), and Tarigan et al. (2023), states that, digitized learning modules provide an "anytime-anywhere" learning opportunity, facilitating education across cross-organizational environments and remote locations. The module should be utilized as a guided or independent learning tool that allows learners to study concepts systematically, complete reflective activities, and apply knowledge to real-life situations within their communities.

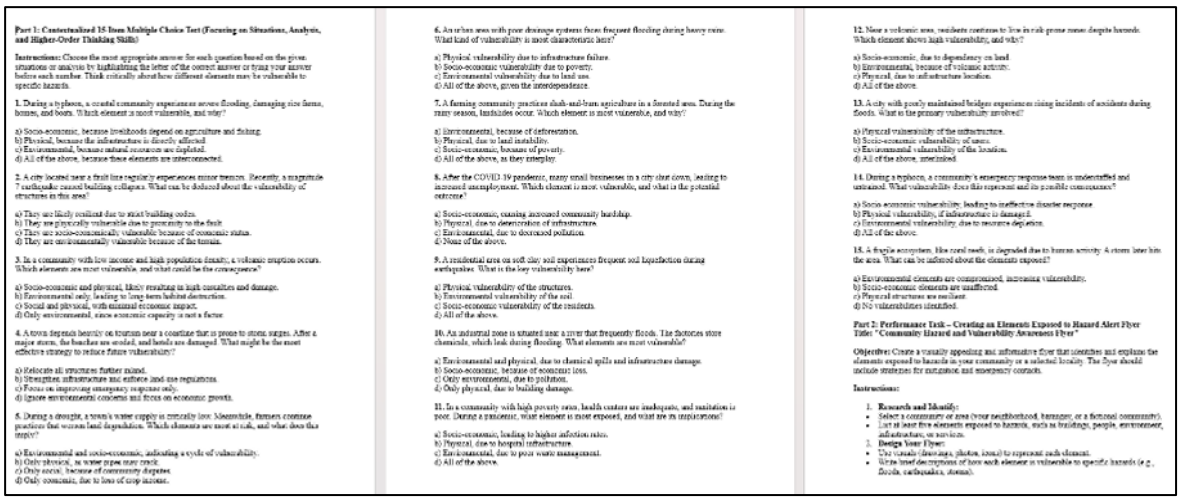

Fig 19 Images of Assessment for Vulnerabilities of Different Elements

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Figure 19 shows images of contextualized assessment for vulnerabilities of different elements. This assessment has two parts, the 15-item multiple choice test and a performance test with rubrics. As part of the Emergency Learning Kit, the assessment serves as a supplementary evaluation tool that determines the learner's comprehension, critical thinking, and ability to analyze vulnerabilities and disaster risks within their own community. It is intended to reinforce lessons presented in the video lesson, presentation, and module while promoting preparedness, awareness, and informed decision-making.

The assessment should be utilized after completing all instructional components of the learning kit to ensure that learners have acquired sufficient knowledge and understanding of the lesson. Its utility lies in helping both learners and facilitators identify strengths, learning gaps, and areas needing improvement while encouraging the practical application of disaster risk reduction concepts for safer and more resilient communities. Reliable assessment confirms that students have attained the standard skills and knowledge required for professional employability and academic standard (Munna, 2021).

- *Evaluation of USB-OTG Emergency Learning Kit*

Table 3 Evaluation Scores of the Respondents on the USB-OTG Emergency Learning Kit

Criterion Factors	Maximum Points	Mean Score	Interpretation
Content Quality	40.00	37.00	Passed
Instructional Quality	40.00	33.60	Passed
Technical Quality	52.00	44.20	Passed
Other Findings	16.00	16.00	Passed

Table 3 presents the mean scores of the LRMDS experts on the different standardbased evaluation criteria for the USB-OTG Emergency Learning Kit. The results reveal that all criteria met the required passing standards. Specifically, Content Quality,

Instructional Quality, Technical Quality, and Other Findings achieved a numerical score interpreted as "Passed," indicating that the developed learning kit met the established evaluation criteria. The zero or near-zero standard deviation in most criteria further suggests a high level of agreement among the evaluators regarding the quality and acceptability of the material.

The findings imply that the USB-OTG Emergency Learning Kit is standardscompliant instructional material for teaching disaster readiness. The high scores in content quality indicate that the material is accurate, relevant, and aligned with disaster risk reduction competencies. Similarly, the satisfactory instructional quality suggests that the learning kit effectively supports teaching and learning processes through appropriate strategies and organization. The strong technical quality further implies that the material is functional, user-friendly, and suitable for flexible learning environments, particularly in areas with limited internet access. Overall, the results suggest that the developed learning kit can serve as a reliable and effective tool for enhancing disaster preparedness education among learners.

These findings are supported by several related studies emphasizing the effectiveness of well-designed disaster readiness instructional materials. Agustin and Cabansag (2023) demonstrated that contextualized DRRM modules developed using Kolb's experiential learning model resulted in high student engagement and improved learning outcomes, which aligns with the high content and instructional quality observed in this study. Garingan (2021) highlighted the need for educational programs and handson learning approaches to improve disaster preparedness, supporting the relevance of the developed learning kit. Similarly, Catedrilla et al. (2021) found that a mobile-based disaster preparedness application was rated "strongly acceptable" based on ISO 25010 standards, which is comparable to the high technical quality obtained in this research. Moreover, Sumarmi et al. (2020) reported that experiential learning approaches significantly enhance disaster education, supporting the instructional effectiveness of the learning kit. Finally, Pescaroli et al. (2020) emphasized the importance of structured evaluation tools, such as Likert-scale-based assessments, to measure disaster preparedness and resilience, which is consistent with the standard-based evaluation criteria employed in this study. Collectively, these studies validate the content quality, instructional quality and technical quality of the USB-OTG Emergency Learning Kit.

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CHAPTER FOUR
SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

This chapter presents a summary of findings and a conclusion based on data gathered through a set of questionnaires, along with the research er's recommendations.

➢ *Summary of Findings*

This study on the design, development, and evaluation of the USB-OTG Emergency Learning Kit for teaching Disaster Readiness and Risk Reduction (DRRR) revealed that the developed instructional material has successfully met LRMDS standards to ensure learning continuity during disaster-induced disruptions through the systematic application of the ADDE Model.

In the Analysis Phase, identifying the least-learned competencies provided a strong foundation for developing the learning kit. The competency "Analyze Disaster from Different Perspectives (Physical, Psychological, Socio-cultural, Economic, Political, and Biological)" ranked first as the most difficult competency, followed by differentiating hazards, exposure, and vulnerabilities, and recognizing vulnerabilities of exposed elements. These findings showed that learners struggled with higher-order thinking skills and conceptual understanding of DRRR concepts. This needs assessment justified the development of an offline supplementary learning material that would directly address these learning gaps and ensure continuity of learning during disruptions.

In the Design Phase, the learning kit was carefully structured using the Cognitive Theory of Multimedia Learning (CTML). The design focused on learner-centered, curriculum-aligned, and context-based instruction by selecting valid and relevant content, organizing lessons logically, and integrating multimedia elements, including narrated video lessons, animated infographics, digital modules, PowerPoint presentations, hazard maps, and self-check quizzes. These materials were selected to simplify complex DRRR concepts, improve learner engagement, and support independent learning in offline environments.

During the Development Phase, the prototype USB-OTG Emergency Learning Kit was successfully developed into an organized, portable offline digital package. It contained video lessons, digital modules, supplementary learning guides, and assessment tools fully compatible with USB-OTG-enabled devices. Guided by CTML and Constructivist Learning Theory, the learning resource promoted active learning, conceptual understanding, and practical application of disaster preparedness concepts. The kit was specifically designed to function effectively even in low-connectivity and disaster-prone learning environments amidst disaster-induced learning disruptions.

In the Evaluation Phase, the developed learning kit underwent standards-based evaluation against LRMDS quality assurance criteria. The results showed that all criteria passed the required standards. Content Quality, Instructional Quality, Technical Quality and Other Findings achieved scores all interpreted as "Passed. These results indicate that the material is accurate, relevant, instructionally effective, technically functional, and free from conceptual and grammatical errors. The near-zero standard deviations further reflected strong evaluator agreement regarding the quality and acceptability of the material.

Overall, the findings demonstrate that the USB-OTG Emergency Learning Kit is a valid, standards-compliant, and effective instructional innovation that responds to identified learner needs, supports disaster readiness education, and strengthens flexible learning continuity in disaster-prone and resource-limited educational settings.

➢ *Conclusions*

The evaluation results confirm that the USB-OTG Emergency Learning Kit is a valid, reliable, and standards-compliant instructional resource for teaching Disaster Readiness and Risk Reduction, demonstrating the successful implementation of the ADDE Model from Analysis to Evaluation.

The strong evaluation outcomes validate that the needs identified during the Needs Analysis Phase were effectively addressed. Giving priority on the least-learned competencies, particularly those requiring higher-order thinking and deeper conceptual understanding, the developed learning kit directly addressed actual learner difficulties and curriculum gaps.

The ratings in content and instructional quality of the Design Phase, where appropriate instructional strategies, multimedia elements, and contextualized learning experiences were carefully selected and organized, led to the development of a learnercentered, relevant, and pedagogically sound instructional material that effectively supported understanding, engagement, and application of Disaster Readiness and Risk Reduction concepts. The use of CTML ensured that the material was learner-centered, relevant, suitable and with appropriate multimedia elements for emergency learning conditions.

The high technical quality ratings further validate the success of the Development Phase, where the selected resources were transformed into a functional, portable, and offline-accessible USB-OTG learning kit. The inclusion of video lessons, modules, presentations, and assessments created a practical learning solution that supports both teachers and learners during disruptions.

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Finally, the Evaluation Phase established that the learning kit met all standard-based quality requirements, with all criteria interpreted as "Passed." This confirms that the developed material possesses strong instructional value, technical usability, and overall acceptability for classroom and emergency learning use.

Therefore, the study concludes that the USB-OTG Emergency Learning Kit is an effective educational innovation that enhances disaster preparedness education, promotes resilient learning continuity, and provides a sustainable instructional solution for disasterprone and low-resource learning environments.

- *Recommendations*

Based on the findings and significance of the study, the following recommendations are hereby offered:

For learners, it is recommended that they maximize the use of the USB-OTG Emergency Learning Kit as a supplementary learning resource in Disaster Readiness and Risk Reduction. Learners are encouraged to engage actively with the materials to strengthen their understanding of DRRR competencies and develop practical awareness and preparedness during disaster-related situations and learning disruptions.

Teachers are recommended to integrate the USB-OTG Emergency Learning Kit into their instructional practices during disaster-induced learning disruptions. Teachers may also consider enhancing the instructional delivery of the material by incorporating interactive activities, feedback mechanisms, and differentiated instruction strategies to improve learner engagement and comprehension.

For school administrators, it is recommended that they support the adoption and implementation of USB-OTG-based learning resources by providing technical assistance, capacity-building training for teachers, and ensuring the availability of appropriate digital infrastructure. Administrators should also consider the inclusion of such materials in school-based disaster preparedness and learning continuity programs.

For parents and communities, it is recommended that they support learners by encouraging the use of the USB-OTG Emergency Learning Kit at home, especially during emergencies or class suspensions. Community stakeholders may also collaborate with schools in promoting disaster awareness and ensuring that learners have a conducive environment for continued learning during disruptions.

For policymakers and curriculum developers, it is recommended that they consider the integration of portable, offline, and disaster-resilient learning tools such as the USB-OTG Emergency Learning Kit in the development of disaster readiness curricula and learning continuity frameworks. Policies that support the development and distribution of low-cost, accessible educational technologies should also be strengthened.

For future researchers, it is recommended that they further enhance and evaluate the USB-OTG Emergency Learning Kit by exploring improvements in learner engagement, interactivity, and technical functionality. Future studies may also focus on testing the effectiveness of the kit across different grade levels, subject areas, and disaster-prone contexts, as well as comparing its impact with other digital and offline learning modalities.

The findings of this study imply that portable and offline instructional innovations such as the USB-OTG Emergency Learning Kit can significantly strengthen teaching practice by ensuring continuity of learning during disruptions while maintaining curriculum quality and accessibility. At the policy level, the study supports the integration of disaster-resilient and technology-assisted learning resources within the Strengthened Senior High School Curriculum to promote sustainable, flexible, and inclusive education. For future research, the study provides a foundation for the continued development of practical instructional innovations that respond to the evolving needs of Senior High School learners in the Philippines.

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APPENDIX A
LETTER TO THE SCHOOLS DIVISION SUPERINTENDENT

Date: April 22, 2026

DANNIE CLARK M. UGUIL, CESE
Assistant Schools Division Superintendent
OIC – Schools Division Superintendent
Schools Division Office of Sagay
Sagay City

Dear Sir:

My name is Levi James J. Arellano, a Master of Arts in Education Major in General Science student of La Consolacion College Bacolod. I am currently undertaking an academic research study entitled "Design and Development of Universal Serial Bus-On-The-Go (USB-OTG) Emergency Learning Kits in Teaching Disaster Readiness and Risk Reduction", as part of my scholarly requirements.

This research aims to design, develop, and evaluate an emergency learning kit that utilizes USB-OTG technology as an alternative instructional tool to support teaching and learning continuity, particularly in disaster-prone and emergency situations.

In this regard, I humbly seek your approval to conduct an academic research study in the Schools Division of Sagay City. The participants in this study are evaluators from LRMDS. Attached herewith is the LRMDS Evaluation Rating Sheet for Non-print materials as my instrument.

Thank you very much for your time and kind consideration. I am hopeful for your favorable response.

Respectfully yours,

LEVI JAMES ARELLANO
Teacher II – Campo Bago National High School
Researcher

Noted by:

CHRISTY ANN G. BANGUANGA
Adviser

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APPENDIX B
LRMDS EVALUATION RATING SHEET FOR NON-PRINT RESOURCES

Evaluation Template 6.6 Refer to Guidelines and Processes for LRMDS Assessment and Evaluation

Factor D. Other Findings **Note down observations about the information contained in the material, where the following errors are found:**	**Not present** 4	**Present but very minor & must be fixed** 3	**Present & requires major redevelopment** 2	**Do not evaluate further** 1
1. Conceptual errors.				
2. Factual errors.				
3. Grammatical and / or typographical errors.				
4. Other errors (i.e., computational errors, obsolete information, errors in the visuals, etc.).				
Total Points				

Note: Resource must score **at least 16 points** out of a maximum **16 points** to **pass** this criterion. Please put a check mark on the appropriate box	☐ **Passed** ☐ **Failed. (All issues must be documented in the Comments section.)**

Other Comments:

_____

Recommendations:

Note: Any material that fails Factor D must not be recommended for use in public schools until the identified issues have been fixed.

A material that failed **in at least one of the four Factors** in this rating sheet should not be recommended for possible use in public schools.

(Please put a check mark (✓) in the appropriate box.)

i. ☐ I / We recommend the approval of this material for possible use in public schools, provided that the corrections/revisions included in this report are made. (For commercial resources (non-DepED-owned resources), the Publisher must implement all recommended corrections/revisions in their next printing or provide errata.)

ii. ☐ I / We do not recommend the approval of this material for possible use in public schools for the reasons stated below and/or cited in this evaluation report. (Please use a separate sheet if necessary.)

I/We certify that this evaluation report and recommendation are my / our own and have been made without any undue influence from others.

Evaluator(s): **ANALYN T. VILLAMOR** Signature(s):_____

(Please print your full name)

_____ _____

_____ _____

_____ _____

Date: _____

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Evaluation Template 6.6 Refer to Guidelines and Processes for LRMDS Assessment and Evaluation

Factor B. Instructional Quality	VS 4	S/NA 3	Poor 2	Not Satisfactory 1
1. Purpose of the material is well defined.				
2. Material achieves its defined purpose.				
3. Learning objectives are clearly stated and measurable.				
4. Level of difficulty is appropriate for the intended target user.				
5. Graphics / colors / sounds are used for appropriate instructional reasons.				
6. Material is enjoyable, stimulating, challenging, and engaging.				
7. Material effectively stimulates creativity of target user.				
8. Feedback on target user's responses is effectively employed.				
9. Target user can control the rate and sequence of presentation and review.				
10. Instruction is integrated with target user's previous experience.				
Total Points				
Note: Resource must score **at least 30 points** out of a maximum **40 points** to pass this criterion. Please put a check mark on the appropriate box.	☐	**Passed**		
	☐	**Failed**		

Factor C. Technical Quality	VS 4	S/NA 3	Poor 2	Not Satisfactory 1
1. Audio enhances understanding of the concept.				
2. Speech and narration (correct pacing, intonation, and pronunciation) is clear and can be easily understood.				
3. There is complete synchronization of audio with the visuals, if any.				
4. Music and sound effects are appropriate and effective for instructional purposes.				
5. Screen displays (text) are uncluttered, easy to read, and aesthetically pleasing.				
6. Visual presentations (non-text) are clear and easy to interpret.				
7. Visuals sustain interest and do not distract user's attention.				
8. Visuals provide accurate representation of the concept discussed.				
9. The user support materials (if any) are effective.				
10. The design allows the target user to navigate freely through the material.				
11. The material can easily and independently be used.				
Technical Evaluation: Complete Section G. Interoperability: Technical format Checklist for conformance If not already completed prior to this review.				
12. The material will run using minimum system requirements.				
13. The program is free from technical problems.				
Total Points				
Note: Resource must score **at least 39 points** out of a maximum **52 points** to pass this criterion. Please put a check mark on the appropriate box	☐	**Passed**		
	☐	**Failed**		

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Evaluation Template 6.6 Refer to Guidelines and Processes for LRMDS Assessment and Evaluation

1.1 Evaluation Rating Sheet for Non-Print Materials

Type of Media (Please check (✔):

☐	CD-Rom	☐	VCD	☐	DVD
☐	VHS	☐	Slides	☐	Transparencies
☐	Cassette tape	☐	Digital interactive	☐	Other: (specify)

Title: **UNIVERSAL SERIAL BUS – ON-THE-GO EMERGENCY LEARNING KIT**

Subject area(s): **DISASTER READINESS AND RISK REDUCTION** Grade/Year Level: 12

DepED Bureau/FAP: _____

Date of Publication: _____

Before completing this Evaluation any CD ROM, VCD or DVD of materials should be viewed and the Technical Evaluation Section G (p72). Interoperability: Technical format Checklist for conformance completed. This is to ensure that the format is compatible with current playback devices and computer operating systems, software and plug-ins.

Instruction: *Examine the material carefully and for each evaluation criterion consider the extent to which the resource meets the criteria. Check the appropriate number [with **4** being Very Satisfactory (VS); **3** - Satisfactory (S); **2** - Poor; and **1** – Not Satisfactory]. For a rating below 4, write your comments/justifications on each evaluation criterion. If an evaluation criterion is **Not Applicable (NA),** the material is rated **3** on said criterion. (Not Applicable means that the criteria is not relevant to the resource being evaluated. It is given the score of 3 so that the evaluation score for each factor reflects only the performance against criteria that are relevant to the nature of the resource being evaluated). Attach extra sheets if necessary. Your report may be completed in soft or hardcopy. Please write legibly if completing in hardcopy*

Factor A. Content Quality	**V S 4**	**S/NA 3**	**Poor 2**	**Not Satisfactory 1**
1. Content is consistent with topics/skills found in the DepED Learning Competencies for the subject and grade/year level it was intended.				
2. Concepts developed contribute to enrichment, reinforcement, or mastery of the identified learning objectives.				
3. Content is accurate.				
4. Content is up-to-date.				
5. Content is logically developed and organized.				
6. Content is free from cultural, gender, racial, or ethnic bias.				
7. Content stimulates and promotes critical thinking.				
8. Content is relevant to real-life situations.				
9. Language (including vocabulary) is appropriate to the target user level.				
10. Content promotes positive values that support formative growth.				
Total Points				
Note: Resource must score **at least 30 points** out of a maximum **40 points** to pass this criterion. Please put a check mark on the appropriate box	☐ **Passed**			
	☐ **Failed**			

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APPENDIX C
SUMMARY OF EVALUATION SCORES OF THE RESPONDENTS ON THE USB-OTG EMERGENCY LEARNING KIT

FACTOR	RATING					MEAN
	EPS – LRMDS	LRMDS QA 1	LRMDS QA 2	EPS – CONTENT QA	Subject Matter Expert	
Content Quality	37	37	37	37	37	37.00
Instructional Quality	33	34	33	34	34	33.60
Technical Quality	44	44	44	45	45	44.20
Other Findings	16	16	16	16	16	16.00

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APPENDIX D
ETHICS REVIEW CERTIFICATE

La Consolacion College Bacolod
Galo corner Gatuslao Streets, Bacolod City, 6100 Philippines
Tel. Nos. +63(34) 4349661 to 64 | Fax +63(34)4335190
Website: www.lcc.edu.ph | Email: lccbpresident@lccbonline.edu.ph

LA CONSOLACION COLLEGE BACOLOD
Institutional Review Board (Ethics)

Certificate of Ethics Clearance (Exempt Review)

This is to certify that the research study entitled:

"Design, Development and Evaluation of Universal Survival Bus – On-The-Go Emergency Learning Kit in Teaching Disaster Readiness and Risk Reduction"

Submitted by:

Levi James J. Arellano
[Graduate School, MAEd Major in General Science]

has undergone review by the Institutional Review Board (IRB) of La Consolacion College Bacolod and has been determined to be **EXEMPT FROM FULL OR EXPEDITED REVIEW**, having been assessed as involving **minimal risk** to participants and in compliance with the institution's ethical standards.

The researcher(s) may proceed with the conduct of the study in accordance with the approved proposal and attached ethical documents.

This clearance is valid for the period: ***MARCH 18, 2026 – DECEMBER 31, 2026***.

Issued this **17th** day of **March**, **2026** at La Consolacion College Bacolod.

Rejay Y. Alvarado, MPM, LPT
Vice Chairperson, IRB (Ethics)
Head, Research and Creative Works Office

LCCB-RES-FO-08
Issue Date: **August 29, 2025**
Approved by: **President**
Issue No: **01** Rev. No. **00**

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APPENDIX E
CERTIFICATION OF STATISTICAL ANALYSIS

CERTIFICATION OF STATISTICAL ANALYSIS

This document certifies that the research paper titled "**Design, Development and Validation of Universal Serial Bus On-The-Go (USB-OTG) Emergency Learning Kit in Teaching Disaster Readiness and Risk Reduction**" written by **Levi James J. Arellano** has been provided statistical assistance according to the guidelines of the institution.

Given this **30th** day of **March, 2026** at Bacolod City, Philippines.

JOJI D. LINAUGO, EdD
Data Analyst

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APPENDIX F
AI DECLARATION STATEMENT

This is to declare that Artificial Intelligence (AI) tools were used in a limited, supportive and ethical manner during the completion of this study entitled:

"Design, Development and Evaluation of Universal Serial Bus-On-the-Go (USB-OTG) Emergency Learning Kit in Teaching Disaster Resilience and Risk Reduction" by Levi James J. Arellano The following AI Tools were used:

- ChatGPT
- ChatPdf
- Anara
- Blackbox AI
- Perplexity AI

Specifically, these tools were used for the following purposes:

- Grammar enhance and editorial suggestions to improve clarity, coherence and academic tone.
- For organization of thoughts and ideas.

No AI systems were used to generate original content, frameworks or the overall structure of this study. All conceptualizations, analysis, interpretations, and conclusions reflect the independent scholarly work of the author. These systems were confined to organization of thoughts and technical writing assistants.

The author assumes full responsibility for the originality, accuracy, and academic integrity of this study.

LEVI JAMES J. ARELLANO
Author