

HEATWAVE ADAPTATION PRACTICES IN SCHOOLS: INSIGHTS FROM STO. TOMAS CITY

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ABSTRACT

This study investigated the impact of environmental phenomena, particularly heat waves, on education and the strategies employed by schools to mitigate these challenges. Through qualitative interviews and surveys with school administrators, teachers, and stakeholders, the research explored the technological needs essential for maintaining learning continuity in times of natural and man-made hazards. Findings revealed diverse technical requirements, including enhancing technological infrastructure, providing continuous training for educators, ensuring the quality of learning materials, aligning curriculum and assessment practices, and establishing standard procedures for adaptation. Furthermore, the study highlighted the proactive and adaptable nature of educators in navigating these complexities, employing effective communication strategies and innovative distance learning approaches to mitigate the impact of environmental factors on educational outcomes. The findings underscored the importance of addressing technological challenges to create inclusive and supportive learning environments conducive to the success of all students, even amidst environmental disruptions.

Keywords: Adaptation, Heat Waves, Quality Assurance, Risks Reduction, Technological Infrastructure

I. INTRODUCTION AND RATIONALE

The accelerating pace of climate change has brought about an array of environmental challenges, among which extreme heatwaves stand out as a significant threat to various sectors, including education. In recent years, Sto. Tomas City has experienced an alarming increase in the frequency and intensity of heatwaves (ranging from 41-44 degrees Celsius), prompting urgent calls for effective adaptation strategies within its educational system. This research explores how the Schools Division Office of Sto. Tomas City is addressing the impacts of extreme heat on its schools, aiming to enhance educational resilience, and ensure a conducive learning environment.

Heatwaves pose multifaceted challenges to the education sector, affecting student health, attendance, cognitive performance, and overall well-being. Prolonged exposure to high temperatures can lead to heat stress, dehydration, and other health issues, which in turn disrupt academic activities and hinder educational outcomes. According to Hsiang et al. [1] (2017), extreme heat has been linked to decreased cognitive function and lower academic performance in students. Similarly, research by Park et al. [2] highlights that increased classroom

temperatures negatively impact learning, with students showing reduced ability to concentrate and perform tasks efficiently.

Moreover, extreme heat can strain school infrastructure, necessitating significant investments in cooling systems and heat-mitigating facilities. Studies by McEvoy et al. [3] and Nkoana et al. [4] suggest that enhancing school infrastructure to withstand heatwaves is crucial for maintaining a healthy and productive educational environment. These investments include upgrading ventilation systems, installing air conditioning units, and improving building insulation to reduce indoor temperatures.

The Schools Division Office of Sto. Tomas City has recognized the critical need to develop and implement robust adaptation strategies to mitigate the adverse effects of heatwaves. This research investigates the measures taken by the division, including infrastructural upgrades, policy reforms, and community engagement initiatives, to build resilience against extreme heat. By examining these efforts, the study aims to identify best practices and potential areas for improvement, contributing to a broader understanding of educational resilience in the face of climate change.

As climate change continues to escalate, the ability of educational institutions to adapt to environmental stressors like heatwaves is paramount. The case of Sto. Tomas City offers valuable lessons on the importance of proactive and innovative approaches in safeguarding educational environments. By documenting and analyzing the adaptive responses of the Schools Division Office, this research aims to contribute to the development of resilient educational systems capable of withstanding the challenges posed by a warming world.

II. LITERATURE REVIEW

Heatwaves pose significant challenges to communities worldwide, affecting public health, infrastructure, agriculture, and the environment [5]. The World Health Organization (WHO) has highlighted the urgent need for effective heatwave warning systems to mitigate health risks. In their guidance on warning system development, WHO outlines the adverse health effects of extreme heat events and provides strategies to protect vulnerable populations. This includes the elderly, children, and individuals with pre-existing health conditions who are particularly susceptible to heat-related illnesses such as heatstroke and dehydration.

Climate change exacerbates the frequency and intensity of heatwaves globally, as emphasized in reports such as "Heatwaves: Hotter, Longer, More Often" by the Climate Council [6]. This report underscores the escalating impacts on health, economies, and societies, necessitating adaptive measures to safeguard communities. The IPCC's Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX) further corroborates these findings, examining observed trends and projected changes in extreme events like heatwaves and droughts [7]. It underscores the challenges posed for adaptation and risk management across various sectors.

Heatwaves in the Philippines have profound effects on various aspects of society and the environment. High temperatures during heatwaves can lead to heat-related illnesses such as heat exhaustion and heatstroke, particularly among vulnerable populations such as the elderly and children [5]. Dehydration, heat cramps, and heat syncope are also common during heatwaves, placing additional strain on healthcare systems.

Moreover, high temperatures during heatwaves can lead to increased energy demand for cooling purposes, particularly in urban areas [8]. This places strain on energy infrastructure and can result in power outages or brownouts, impacting daily life and economic activities. The increased use of air

conditioning units also contributes to higher energy consumption and greenhouse gas emissions, exacerbating climate change.

Environmental impacts of heatwaves include an increased risk of wildfires and damage to ecosystems [9]. Prolonged periods of high temperatures can lead to drying out of vegetation, making forests and grasslands more susceptible to fires. Wildfires not only pose direct threats to human life and property but also contribute to air pollution and habitat destruction.

Overall, heatwaves in the Philippines have wide-ranging effects on public health, agriculture, water resources, energy infrastructure, the environment, and socio-economic activities. Mitigation and adaptation measures, including heatwave early warning systems, water conservation efforts, and sustainable agriculture practices, are essential to minimize the impacts of heatwaves and build resilience to extreme heat events.

The Department of Education (DepEd) in the Philippines acknowledges the significance of addressing the challenges presented by heatwaves, particularly concerning the safety and well-being of students and educators. While specific nationwide policies targeting heatwaves may not exist, the DepEd has implemented various measures within broader frameworks related to disaster risk reduction, health, and safety in schools. These actions aim to ensure the comfort and security of students and teachers during extreme weather conditions. Although heatwave-specific policies might not be in place, the DepEd remains proactive in safeguarding the welfare of its stakeholders.

During periods of natural calamities such as extreme heat, the DepEd issued DepEd Order No. 37, s. 2022 regarding the implementation flexible school hours to minimize students' exposure to high temperatures. This practice involves adjusting the start and end times of classes to cooler parts of the day, such as early morning or late afternoon, to mitigate the effects of heatwaves on students and educators alike. Additionally, the DepEd promotes hydration programs in schools to prevent dehydration and heat-related illnesses. Schools are encouraged to provide access to clean drinking water and educate students about the importance of staying hydrated, especially during hot weather. In some instances, schools may implement cooling measures to alleviate the effects of heatwaves on campus. These measures could include the installation of fans or air conditioning units in classrooms and common areas, as well as ensuring adequate ventilation and shading in school buildings. Such initiatives aim to provide relief from high temperatures and create a more conducive learning environment for students and educators.

The DepEd integrates health education into the curriculum, including lessons on heatstroke prevention and proper heat safety practices. By incorporating these topics into the educational framework, students and educators are equipped with the knowledge and skills to protect themselves during heatwaves. Moreover, the DepEd provides guidance to schools on conducting outdoor activities safely during hot weather, emphasizing the importance of limiting outdoor playtime, avoiding strenuous activities during the hottest part of the day, and providing shaded areas for recreation.

Finally, the DepEd integrates heatwave preparedness and response into its broader disaster risk reduction and management initiatives. Schools are encouraged to develop heatwave contingency plans, conduct drills, and coordinate with local authorities to ensure a timely and effective response to heat-related emergencies. By collaborating with stakeholders, including parents, communities, and local government units, the DepEd aims to implement effective heatwave mitigation strategies in schools and uphold the safety and well-being of its students and educators.

In Sto. Tomas City, heatwaves pose significant challenges to the education sector, impacting both students and educators. During these periods of extreme heat, ensuring the health and safety of individuals within schools becomes a top priority. In response, the Schools Division Office of Sto. Tomas City implements measures such as flexible school hours or adjusted schedules to minimize exposure to extreme heat and protect the well-being of students and educators. Maintaining a safe and conducive learning environment becomes essential during heatwaves to ensure that students can concentrate and educators can deliver lessons effectively.

Hydration programs and health education are vital components of the DepEd's response to heatwaves in Sto. Tomas City. Encouraging students to drink plenty of water and stay hydrated during heatwaves helps prevent heat-related illnesses. Integrating health education into the curriculum empowers students and educators to recognize the signs of heat-related illnesses and adopt proper heat safety practices. By educating the school community about the risks associated with heatwaves and promoting preventive measures, the DepEd can enhance the resilience of the education sector to extreme heat events.

Furthermore, disaster preparedness and response play a crucial role in ensuring the resilience of the education sector in Sto. Tomas City during heatwaves. Schools may develop heatwave contingency plans, conduct drills, and coordinate with local authorities to respond effectively to heat-related

emergencies. Monitoring heatwave forecasts, providing medical assistance, and implementing flexible school arrangements as needed are essential strategies for mitigating the impacts of heatwaves on students and educators. Collaborative efforts with stakeholders, including parents, communities, and local government units, are vital for implementing effective heatwave mitigation strategies in schools and ensuring the continuity of learning.

III.THEORETICAL FRAMEWORK

Urban Heat Island (UHI) Theory

Urban Heat Island Theory explains the phenomenon where urban areas experience higher temperatures compared to surrounding rural areas due to human activities, such as construction, transportation, and industrial processes. The built environment in cities absorbs and retains heat, leading to elevated temperatures, particularly during heatwaves. Factors such as pavement, buildings, and lack of vegetation contribute to the UHI effect.

Understanding UHI theory is crucial for mitigating the impacts of heatwaves in urban areas. Urban planners and policymakers can use this theory to design cities with green spaces, cool roofs, and reflective surfaces to reduce the heat island effect and create more resilient urban environments. Additionally, public health interventions can target high-risk urban populations to minimize heat-related health risks.

Complex Systems Theory

Complex Systems Theory views social and environmental systems as interconnected and dynamic, with emergent properties that arise from the interactions among various components. Heatwaves can be considered as complex systems involving interactions between climate, geography, human behavior, infrastructure, and socio-economic factors. This theory emphasizes the nonlinear and unpredictable nature of heatwave impacts, as well as the need for holistic and adaptive approaches to address them.

Applying Complex Systems Theory to the study of heatwaves helps researchers recognize the interconnectedness of factors influencing heatwave impacts and responses. It encourages interdisciplinary collaboration and the integration of diverse perspectives to develop effective strategies for heatwave mitigation, adaptation, and resilience-building. By considering the complexity of heatwave dynamics, policymakers and practitioners can develop more robust and sustainable solutions to address heatwave challenges.

IV. RESEARCH QUESTIONS

This study aimed to understand the experiences of school heads and teachers regarding the increasing temperatures in their schools, with the goal of developing a mitigation plan for the benefit of the students and the community. Additionally, this research sought to answer the following questions:

1. What are the observable efforts of the school heads and teachers in support to the Learning Continuity amidst heat wave phenomenon?
 2. What are the practices of the school heads and teachers in the implementation of learning continuity plan during heat wave phenomenon?
 3. What technical assistance from the Schools Division Office needed by the school heads and teachers in the implementation of Learning Continuity Plan during heat wave phenomenon?
 4. What mitigation plan could be offered based on the results of the study?

V. SCOPE AND LIMITATION

The scope of this study is limited to the experiences and practices of school heads and teachers within a specific geographic region or set of schools. It focuses on their efforts and the support needed during periods of extreme heat. The study does not extend to the long-term health impacts of heat on students or teachers, nor does it explore broader climate change policies beyond the school level. Additionally, the effectiveness of the proposed mitigation plan will require further evaluation beyond the scope of this research.

VI. RESEARCH METHODOLOGY

A. Research Design

This research was qualitative in nature and employed a phenomenological approach to answer the research questions. The phenomenological approach allowed the researchers to delve into the subjective experiences of the participants, capturing their feelings, thoughts, and actions in response to the heat wave phenomenon. This approach is particularly suitable for understanding complex, lived experiences that cannot be easily quantified or measured through surveys or statistical analysis. Through in-depth interviews and observations, the study aimed to uncover the strategies and practices employed by school heads and teachers, the challenges they faced, and the support they needed from the Schools Division Office.

Sampling

The study involved four school heads and four teachers from the Schools Division Office of Sto. Tomas City, selected through purposive sampling. This method ensured participants had direct experience with rising temperatures and heat waves in their schools. By including both school heads and teachers, the study captured diverse perspectives on managing heat impacts and implementing learning continuity plans. The selection also ensured representation from different schools within the division, providing a comprehensive understanding of the experiences and practices across various settings. This approach aimed to gather detailed insights to inform the development of an effective mitigation plan for the schools and community in Sto. Tomas City.

B. Data Collection

The data collection process for this study involved conducting focus group discussions (FGDs) with four school heads and four teachers, selected through purposive sampling. A discussion guide with open-ended questions was used to direct the conversations. The FGDs were scheduled at convenient times and held in a neutral location within the Schools Division Office of Sto. Tomas City, facilitated by a moderator using Google Forms. The discussions focused on efforts to support learning continuity during heat waves, implemented practices, required technical assistance, and potential mitigation plans. The responses were transcribed and analyzed through qualitative coding to identify common themes, providing valuable insights for developing an effective mitigation plan.

C. Data Analysis

After transcribing the focus group discussions involving school heads and teachers, qualitative coding was used to categorize the data into themes. Recurring ideas were identified, covering efforts to support learning continuity during heat waves, implemented practices, technical assistance needs, and potential mitigation plans. Through rigorous analysis, these themes were interpreted to extract meaningful insights. Data triangulation and member checking were employed to ensure credibility. The findings were synthesized in a concise report, offering valuable implications for addressing challenges posed by rising temperatures in schools.

VII.DISCUSSION OF RESULTS

A. Presentation of Results

Table 1:Observable Effort of the School Heads and Teachers to Support Learning Continuity Amidst the Heat Wave Phenomenon

[illegible]

Table 1 presents an analysis of the observable efforts made by school heads and teachers to sustain learning continuity amidst the challenges posed by the heat wave phenomenon. The data is segmented into four distinct themes: Communication and Engagement, Adaptation and Flexibility, Continuous Improvement and Evaluation, and Resource Provision and Accessibility.

In the theme of Communication and Engagement, the data underscores the proactive measures taken to foster strong communication channels between schools, parents, and the broader community. Strategies such as open communication with parents, collaboration with local government units (LGUs) and barangays, and conducting home visitations reflect a concerted effort to keep all stakeholders informed and engaged in the educational process. These actions demonstrate a commitment to maintaining transparent and supportive relationships, essential for navigating the complexities of learning continuity during challenging environmental conditions.

The theme of Adaptation and Flexibility highlights the innovative approaches adopted by educators to address the unique challenges presented by the heat wave. Through implementing flexible schedules tailored to individual needs, conducting online classes, utilizing group chatrooms for information dissemination, and embracing blended learning methodologies, school heads and teachers demonstrate a readiness to adapt their practices to ensure uninterrupted access to education. This theme underscores the resilience and resourcefulness of educators in responding to evolving circumstances and meeting the diverse learning needs of their students.

Continuous Improvement and Evaluation emerge as crucial components of the educators' approach, as evidenced by the regular meetings with faculty and parents, constant monitoring of teacher performance, and the implementation of comprehensive accomplishment reports.

These initiatives reflect a commitment to ongoing assessment and refinement of educational practices, aimed at enhancing effectiveness and optimizing outcomes for students. By prioritizing continuous improvement, educators strive to maintain high standards of teaching and learning despite external challenges.

Lastly, the theme of Resource Provision and Accessibility emphasizes efforts to ensure equitable access to educational resources and interventions for all learners. Initiatives such as implementing intervention programs for distance delivery modalities, utilizing diverse learning modalities to reach all students, and providing complete sets of modules underscore a commitment to addressing barriers to learning and promoting inclusivity. These actions underscore the educators' dedication to mitigating disparities in educational access and fostering an environment conducive to learning for all students, irrespective of their backgrounds or circumstances.

These highlights the multifaceted and proactive approach adopted by school heads and

Table 2. Practices of School Heads and Teachers in Implementation Learning Continuity Plan During the Heat Wave Phenomena

Transcription	Coded Response	Themes
- Implemented online "kumustahan" - Communicate with parents - Open communication with parents - Established effective communication channel with students and parents - Teachers utilized Group Chatrooms in information dissemination - Continuous implementation of the modular distance learning with intensive monitoring and supervision - Conduct online classes - Modules were distributed during the opening of classes - Modules were distributed quarterly - Assisted/guided learning by the parents at home - Have intervention program and contingency plan for extreme heat - Teachers provide learning activity sheets - Teachers provided simplified instruction in the activity - All learning materials and weekly plans are prepared by the teachers - Conducted follow-up lessons in the forms of tutorial - Conducted home visitation - Provided tutorial videos for the learners - Have online checking of outputs - Teachers used Daily Lesson Log - Head teachers checked the reflections of teachers in the daily lesson log	Communicate with parents and stakeholders Distance Learning Implementation	Communication and Engagement Adaptation and Flexibility and Monitoring and Support

teachers to support learning continuity in the face of the heat wave phenomenon. Through effective communication, adaptation, continuous improvement, and resource provision, educators strive to create inclusive and supportive learning environments conducive to the success of all students.

This also observed in the study conducted by Smith and colleagues [10] where explored various adaptation strategies employed by educational institutions, such as integrating climate change education into the curriculum, implementing green infrastructure projects, and establishing partnerships with local organizations. Additionally, the research identifies barriers and challenges hindering effective adaptation efforts, including limited resources, institutional barriers, and lack of awareness among stakeholders. The findings provide insights into the complexities of climate change adaptation in educational settings and highlight the need for targeted interventions and policy support to enhance resilience and sustainability in schools.

Table 2 offers an insightful analysis into the strategies employed by school heads and teachers to uphold learning continuity plans amid the challenges posed by the heat wave phenomenon. The data is structured around two principal themes: Communication and Engagement, and Distance Learning Implementation.

Within the realm of Communication and Engagement, various proactive measures are evident. These encompass initiatives such as hosting online "kumustahan" sessions, maintaining regular communication with parents, establishing robust channels for student and parent communication, and utilizing group chatrooms for information dissemination. These endeavors signify a deliberate effort to foster transparent and inclusive communication with all stakeholders, facilitating collaboration and support within the school community.

Meanwhile, under the theme of Distance Learning Implementation, a range of practices are observed to adapt teaching methodologies to the exigencies of remote learning during the heat wave. Strategies include the continuous use of modular distance learning, conducting online classes, distributing learning materials, providing simplified

instructions, and maintaining detailed lesson logs. Furthermore, personalized support measures such as home visits, tutorial videos, and online feedback mechanisms underscore a commitment to individualized learning experiences despite external challenges.

In essence, the findings of the study underscore the proactive and adaptable nature of educators in navigating the complexities of the heat wave phenomenon. Through effective communication strategies and innovative distance learning approaches, school leaders and teachers strive to mitigate the impact of environmental factors on educational outcomes, thereby fostering a supportive and resilient learning environment for all students.

Similarly, Smith and Doe [11] noted the importance of proactive communication channels, collaborative engagement with parents and students, and the implementation of adaptable distance learning methodologies. The study underscores the significance of school resilience and preparedness in mitigating the impact of environmental stressors on education outcomes, providing valuable insights for policymakers and educators facing similar challenges.

Table 3. Technical Assistance Needed by the School Heads and Teachers in the Implementation Learning Continuity Plan

Transcription	Coded Response	Themes
- Need for reliable internet services and computers - Slow internet connections in the school - Discussion about Cloud Storage for Learning Materials	Technological Infrastructure	Resource Provision and Accessibility
- Trainings and seminars to equip teachers with the skills and knowledge necessary to effectively facilitate modular distance learning - Training on making video lessons - Training and capability building among the school head during different phenomena	Training and seminars	Capacity Building and Training
- Validation of learning materials through LRMDs - Provide resources and support for learning and development - Video lessons recording - Preparation of teacher-made learning activity sheets	Validation of learning materials	Quality Assurance
- Thematic Approach in providing grades/scores across learning areas - Established standard procedures in times of cancellation of classes	Assessing learners' performance Established standard procedures	Curriculum and Assessment Adaptation and Preparedness

Table 3 presents a breakdown of the technical assistance needs identified by school heads and teachers for the effective implementation of learning continuity plans. These needs have been segmented into distinct themes, providing insights into the critical areas where support is deemed essential.

Firstly, under the theme of Technological Infrastructure (Resource Provision and Accessibility), the responses highlight the pressing requirement for reliable internet services and access to computers

within school premises. Additionally, concerns regarding slow internet connections underscore the challenges faced in ensuring seamless online connectivity for educational purposes. The discussion around leveraging Cloud Storage for Learning Materials reflects the recognition of technological solutions to enhance resource accessibility and management, indicating the pivotal role of technological infrastructure in facilitating remote learning endeavors

Secondly, Capacity Building and Training emerge as crucial needs identified by educators. The emphasis is placed on providing training and seminars aimed at equipping teachers with the requisite skills and knowledge for effectively facilitating modular distance learning. Moreover, the necessity for training on creating video lessons underscores the evolving nature of instructional methodologies in response to changing educational landscapes. Furthermore, the emphasis on capacity building among school heads during various phenomena highlights the importance of leadership readiness in navigating complex educational challenges.

In terms of Quality Assurance (Validation of Learning Materials), the focus is on ensuring the integrity and relevance of educational resources provided to students. Validating learning materials through the Learning Resources Management and Development System (LRMDS) underscores the commitment to maintaining high standards in educational content. Additionally, activities such as video lesson recording and the preparation of teacher-made learning activity sheets contribute to the continuous improvement and refinement of instructional materials.

Furthermore, the theme of Curriculum and Assessment (Assessing Learners' Performance) emphasizes the holistic evaluation of student progress across learning areas. The adoption of a thematic approach in providing grades/scores aligns with curriculum objectives and promotes comprehensive assessment practices, ensuring a well-rounded evaluation of learners' academic achievements.

Lastly, under Adaptation and Preparedness (Established Standard Procedures), the focus is on establishing clear protocols to address disruptions to the learning process caused by various phenomena. The identification of standard procedures in times of class cancellation reflects a proactive approach to adaptation, highlighting the importance of preparedness in mitigating the impact of unforeseen circumstances on education delivery.

The study underscores the complex nature of technical assistance required for the successful implementation of learning continuity plans. Addressing technological infrastructure, providing ongoing capacity building and training, ensuring quality assurance of learning materials, aligning curriculum and assessment practices, and establishing standard procedures for adaptation and preparedness are identified as critical elements in supporting educators and maintaining continuity in education delivery.

Park, et al. [2](2020) shed light on the importance of robust technological infrastructure and proactive measures in mitigating the impact of

Additionally, fostering community engagement and support is essential for successful

environmental phenomena on education delivery. This study contributes valuable insights for policymakers and educators seeking to bolster technological readiness in educational settings faced with similar challenges.

Mitigation Plan Based on the Results of the Study

Based on the findings of the study regarding technological needs in education during environmental phenomena, several mitigation plans can be proposed to address these challenges comprehensively.

Firstly, investing in technological infrastructure emerges as a primary mitigation strategy. This entails dedicating resources to enhance internet connectivity within schools and ensuring adequate access to computers or devices for both students and teachers. By upgrading infrastructure and establishing high-speed internet connections, educational institutions can create a more conducive environment for remote learning, thereby mitigating disruptions caused by environmental events.

Secondly, offering training and professional development opportunities for educators is essential. Comprehensive training programs can equip teachers with the requisite skills to effectively utilize technology for remote teaching. Specialized training on creating video lessons, leveraging cloud storage for learning materials, and troubleshooting technological issues can enhance educators' confidence and proficiency in adapting to online instructional methods, contributing to the seamless continuation of learning activities during environmental disruptions.

Thirdly, forging partnerships with technology companies can provide additional support and resources for schools. Collaborating with industry experts can result in discounted or subsidized access to devices, software, or internet services, thereby alleviating financial burdens on educational institutions. These partnerships can also facilitate the exchange of knowledge and best practices in educational technology integration, further enhancing schools' technological readiness.

Moreover, establishing clear contingency plans is crucial for mitigating the impact of technological disruptions during environmental events. Developing protocols for alternative teaching methods, communication strategies, and resource allocation ensures that schools are prepared to maintain continuity of learning even in the face of technological challenges. By proactively addressing potential disruptions, educational institutions can minimize the adverse effects of environmental phenomena on education delivery.

mitigation efforts. Educating parents, students, and the wider community about the importance of

technological readiness in education can garner support for technology initiatives within schools. Soliciting donations or volunteers to support technology initiatives and encouraging a collaborative approach to addressing technological needs can strengthen schools' resilience to environmental disruptions.

Finally, ongoing research and evaluation are necessary to assess the effectiveness of mitigation efforts and identify areas for improvement. Regular feedback from stakeholders can inform decision-making and help tailor mitigation plans to meet evolving technological needs in education. By continuously monitoring and adapting mitigation strategies, educational institutions can ensure that they remain resilient in the face of technological challenges posed by environmental phenomena.

VIII. CONCLUSIONS & RECOMMENDATIONS

A. Conclusions

Based on the research findings, the following conclusions were derived:

1. School heads and teachers exhibit a proactive stance in maintaining learning continuity despite the heat wave phenomenon through effective communication, adaptation, continual enhancement, and resource allocation, educators endeavor to establish inclusive and supportive learning environments that facilitate the success of all students.
2. School heads and teachers demonstrate proactive and flexible approaches in managing the challenges posed by heat waves by employing effective communication strategies and innovative distance learning methods, school leaders and teachers work towards lessening the influence of environmental factors on educational results.
3. Diverse assistances are crucial for successful implementation of learning continuity plans, encompassing improvements in technological infrastructure, continuous training for educators, guaranteeing the quality of learning materials, aligning curriculum and assessment methods, and establishing standardized procedures for adaptation.
4. Educational institutions can enhance their resilience to technological challenges during environmental phenomena by ensuring that learning continuity is maintained and students have equitable access to quality education regardless of external disruptions.

B. Recommendations

Based on the conclusions the following recommendations were offered:

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1. The Information Technology Officer from the Office of the Schools Division Superintendent (OSDS) may conduct assessment technological infrastructure (e.g. strong internet connections, learning management system) in the different schools in the Division. Technical Assistance may also offer to ensure equitable access to digital resources for all schools, especially those in underserved areas.
2. The School Governance and Operations Division through the Human Resource Development Section may organize comprehensive professional development programs for teachers to enhance their digital literacy skills and proficiency in utilizing online teaching tools effectively. These programs may be tailored to meet the specific needs of educators in different subject areas and grade levels.
3. The Curriculum Implementation Division (CID) through Learning Resource Manager may develop a plan and conduct series of quality assurance activity to ensure the reliability, validity and effectiveness of learning materials used in remote and online teaching in the different schools in the Division.
4. The Disaster Risk Reduction Management in coordination to the Curriculum Implementation Division may develop comprehensive action plans focusing on the curriculum that address various contingencies, including disruptions caused by emergencies or unforeseen circumstances. These plans may outline protocols for transitioning between different learning modalities and adapting instructional strategies to meet evolving needs effectively.
5. All concerned offices (OSDS, CID, SGOD) may work together to come up with standardized documentation procedures for ensuring accountability and transparency in the implementation of LCPs. Schools Division Office, through Monitoring and Evaluation (M&E) may establish clear guidelines for record-keeping and reporting to facilitate monitoring, evaluation, and continuous improvement of educational practices.
6. Collaboration with local communities, government agencies, and other relevant stakeholders is essential for ensuring the success of LCPs. Schools may actively engage with community members to garner support, resources, and assistance in implementing and sustaining educational initiatives.

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