International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Exploring the Lived Experiences of Teachers of Juban District Amidst High Heat Index: Their Resilience in the Delivery of Instruction

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Abstract

This phenomenological study centered on exploring the lived experiences of teachers of Juban District amidst high heat index and their resilience in the delivery of instruction. It utilized a qualitative approach in examining the data from the twenty participants who were selected through the convenience sampling technique. Significantly, the researcher categorized the various themes that emerged from participants' responses. These themes aided the researcher in coming up with pertinent and useful concepts regarding teachers' perceptions and experiences regarding HHI and its impact primarily on the learners' acquisition of knowledge and teachers' delivery of instruction.

In the same manner, the researcher sorted the data accordingly based on six concepts mainly, the impact of a high heat index on the delivery of instruction, strategies employed by teachers to manage the physical and emotional stresses associated with teaching HHI, ways on how teachers adapt their instructional methods to maintain student engagement and learning outcomes during periods of extreme heat, the role played by support systems and community dynamics in helping teachers cope with the challenges of HHI, the influence of teachers' experiences with high heat conditions on their overall well-being and professional resilience and the mitigating measures employed by teachers during HHI to continue meeting classroom instructions. Moreover, the emerging themes were the foundations for the development of findings, conclusions, and recommendations of this recent study.

Furthermore, to collect data from the participants the researcher crafted guide questions which were utilized during the conduct of in-person interviews and focus-group discussions. These processes were religiously observed to ensure the validity and reliability of the results.

Chapter I
THE PROBLEM AND ITS SETTING

Introduction

Global warming is one of the serious environmental catastrophes since humanity has powered modern ways of living to suit the demands of the time and relate to the ever-changing society influenced by the upsurge of technology. With the technological breakthrough, everything is set and done with just a click and button wherein humanity enjoys its comfort and ease in today's complex life. On the contrary, the world became exhausted and exploited which in turn absorbed all the destructive elements in nature and caused the Earth to get hotter and hotter every single day.

It is sad to note that humans have caused most of the past century's warming due to their exertion to build a society where advancement is evident and enjoyed by everyone. As proof, the levels of greenhouse gases

are higher now than at any time in the last 800,000 years. Likewise, climate change incorporates life-threatening weather events, unstable wildlife populations and habitats, rising seas, and sets of other ill impacts. All of those changes are evolving as people continue to add heat-trapping greenhouse gases to the atmosphere, changing the paces of climate that all living things have come to rely on (Nuñez, 2019).

Consequently, experts in the field have a high belief that global temperatures will continue to rise for many decades, mainly due to greenhouse gases produced by human activities. These resulted in some changes including droughts, wildfires, and extreme rainfall which are happening and experiencing faster than scientists previously assessed (NASA, 2024). The precise and systematic indications are clear, that climate change is a threat to human welfare and the future of the planet. The inadvertence of humans to the negative impact of this environmental crisis and delay in global action would certainly close the windows to a safe and greener future for the next generation.

Significantly, in 2022, Ellerbeck wrote an article entitled *"Climate Change is Already Altering Everything, from Fertility Choices to Insuring our Homes"*. He pointed out that global warming is already affecting the lives of people in many ways. These include health issues, people's cost of living, warming oceans threatening human lives, fewer babies to be born, uninsurable properties, and the threat of another pandemic. These negative impacts on humanity would continue to prosper if long-term sustainable solutions and actions were not prioritized by individuals, groups, and society.

Consequently, high heat index, (HHI) as the aftereffect of global warming, is a measure of how hot it feels outside, when humidity and other factors are considered along with the temperature. For example, when the temperature outside is 92 degrees and the humidity is 70 percent, the heat index is 112 degrees. So, when the heat index scopes at that level, it would be dangerous because it can cause sunstroke, muscle cramps, and heat exhaustion. Likewise, for people who do physical activities outside and stay long enough under those conditions, heatstroke could happen (Jimenez, 2023).

On the contrary, HHI does not only pose dangers to health aspects and medical conditions. It also impacts negatively on agriculture, infrastructure, energy consumption, work productivity, and the environment. (Gordon, 2024). As global warming continues, the high heat index will never be put to a halt. A group of researchers predicts that people across the globe will experience an increase in heat indexes up to 10 times more than what they are now. By 2100, people living in the tropics will be exposed to extremely high heat indexes most days of the year.

Delving deeper into the harsh impact of heat on work productivity and environment, discomfort and uneasiness were experienced by workers especially those who are working outside the buildings and in open fields. As a result, workers are forced to stop and stay in cooler places to avoid the harm brought about by severe heat. In this situation, work is delayed and so other related circumstances would be inefficient and affected in unavoidable settings. For instance, both high- and low-income countries were affected by heat on productivity with more severe and significant effects on lower-income settings, such as in plant-level output in India. There was a reduction by as much as 3.5% in years with temperatures 1°C higher, and output in car manufacturing facilities in the United States 8% lower in weeks with six 90°F days. These declines in productivity result in lower wages for workers (Behrer, 2023).

Correspondingly, the United Nations Development Program (2016) reported that workers were less effective outside, in factories, in offices, and or on the move when it was too hot. Their ability to work physically and mentally diminished, the risks of accidents increased and serious heat-related health risks including heat stroke, severe dehydration, and exhaustion exposed them to life-threatening conditions. In this situation, governments and international organizations have long put in place standards on thermal

conditions in the workplace. But climate change has already altered thermal conditions in the workplace, and additional warming is a serious challenge for any worker or employer reliant on outdoor or non-air-conditioned work. To sum up, planet Earth is getting hotter and has warmed by 1 degree Celsius, about 2 degrees Fahrenheit (Gibbens, 2024).

The scenario presented above was supported by the study of Flouris et al. (2018) who concluded that working in hot conditions for very intense work increases the likelihood of experiencing occupational heat strain, with significant detrimental effects on health and productivity. The results showed that individuals working in heat-stress conditions were four times more likely to experience occupational heat strain during or at the end of a work shift compared with individuals working in thermoneutral conditions. This occupational heat strain is also associated with dehydration and kidney disease or acute kidney injury. Moreover, this study revealed that 30% of individuals working in heat stress conditions had losses in productivity by 2·6% for every degree increase beyond 24°C.

Remarkably, the education spectrum, specifically its internal stakeholders and classrooms had also been impacted by the high heat index. The discomfort and stress experienced by the students and teachers posed a threat not only to health conditions but also to their academic performance and productivity. This was evident in the classroom setting where students felt fatigued and unable to concentrate on learning tasks and on the part of the teachers who found difficulty in encouraging learners to be active in various academic activities. The sad reality of the negative impact of heat on learners and teachers endangered school administrators and educational leaders in the worst-case scenario this phenomenon might trigger.

To support the ill-effect of HHI on the education sector, Will (2022) revealed that researchers found that cumulative heat exposure decreases the productivity of instructional time without school air conditioning. Also, another study found that students scored significantly lower on the standardized state test on a 90-degree day than on a 72-degree day. And importantly, the study linked exam-time heat exposure with a lower likelihood of on-time high school graduation. Moreover, a separate recent study discovered that the impact of heat on mathematics achievement is about three times larger than its impact on achievement in English/language arts. Teachers believe that students can be unmotivated and distracted when sitting in a hot classroom. Additionally, research shows that cognitive function declines during excessive heat, leading to slower reaction times on assessments.

In the Philippines, the high heat index became a nationwide issue that prompted educational leaders to tailor immediate and urgent solutions to lessen the ill effects of the phenomenon. Mondejar (2023) exposed that HHI affects Filipino students' ability to learn and perform well academically. Studies have shown that exposure to high temperatures can lead to decreased cognitive function, lower test scores, and increased absenteeism. Consequently, extreme heat not only affects the physical and health conditions of the learners but also hinders them from learning.

The above-cited statement is synonymous with the insights shared by Valerio (2024) who claimed that extreme heat in educational settings especially in regions with poor ventilation students and teachers might struggle to concentrate and perform optimally due to the oppressive heat. This condition also affects infrastructure which leads to disruption of the learning environment and impediments to academic progress. Furthermore, overheated classrooms may force schools to cancel classes thus disrupting academic learning and other extra-curricular activities.

The article titled *The Real Impact of Rising Heat on Learners and Teachers* (2024) stressed that the assessment, which involved 8,605 teachers from all DepEd divisions in Metro Manila, aimed to evaluate the consequences of rising heat index on the well-being of educators and learners, results showed that 87%

of the respondents surveyed expressed their concern about the harmful impact of the heat on the learning ability of the students. Additionally, 77% of participants in ACT-NCR said they have trouble with the scorching classroom temperatures. Furthermore, according to the survey, 46% of classrooms have only one to two electric fans, indicating insufficient measures to mitigate the increasing temperatures.

Meanwhile, the Philippine Daily Inquirer (2023) reported that the state weather bureau recorded up to a 47-degree Celsius heat index in Albay province in the past few days. This prompted the regional director to give an order regarding the cancellation of classes in elementary and secondary schools and allowed modular and online classes as alternative means of delivering instruction. In the same manner, university presidents also resorted to the suspension of classes to promote the safety and protection of teachers and learners.

Significantly, the researcher, as one of the educational leaders observed how overwhelming HHI impacted teachers and learners in the field. The everyday struggles of these individuals are noticeable as they experienced difficulty staying in classrooms under extreme heat. The worst part is even the teaching and learning process is affected since learners have poor concentration in academic activities resulting in low performance and failure to attain mastery of the learning objectives. In addition, teachers are also challenged to sustain students' interest and attention because most likely they experienced discomfort and uneasiness during hot temperatures. With this condition, absenteeism is expected and so learning is hindered.

With the undisputable adverse effects of high heat index on teachers and students, the researcher of this present study courageously proposed to explore the lived experiences of elementary teachers in one of the municipalities in the province of Sorsogon during the occurrence of this phenomenon. This study further aimed to discover the effects of HHI on the teaching-learning process of the teachers, factors that affect the resiliency of the teachers in delivering instruction, and measures conducted by the teachers to mitigate the problem and engage learners for continuous learning.

To champion education, the researcher firmly believes that learners have the right to a safe and healthy environment where they can freely develop their skills and enhance their knowledge. In the same manner, teachers, as facilitators of learning, should be supported and acknowledged for their never-ending commitment and dedication to empowering learners through instruction. This paper will document all the details regarding the involvements of both the teachers and the students as they survived the inconvenience brought about by extreme heat and provide meaningful reflections as to what should be done to mitigate the occurrence of this crisis.

This phenomenological study intends to provide honest and first-hand information on the lived experiences of the participants in the onslaught of HHI. The researcher affirms that this study would shed light on the real encounters of teachers and students and provide imperatives from the educational authorities that would be of great help and assistance to victor the real essence of education taking into consideration the welfare and safety of the schools' internal players.

The Setting of the Study

The setting of the study refers to the physical, social, or experimental background within which research is conducted. It is crucial to describe the setting of the research since the results and their interpretations may be profoundly subjective. In most cases, the setting includes the social group, the period of study, the geographic location, environmental problems, the availability of resources, and the like (Editage Inside, 2020). Identifying the setting and its scope aids the proponent and other researchers in deeply recognizing the relevance and framework of the research.

The researcher, as a cluster head in the Juban district, had been immersed in the day-to-day encounters of the people specifically in the facet of education. The lived experiences of teachers on the delivery of instruction and their challenges prompted the proponent to conduct a study that focuses on issues that confront her subordinates and stakeholders. It was fitting to understand and brainstorm existing phenomena that challenge the people and provide effective recounts to establish solutions and recommendations.

Juban, officially the Municipality of Juban, is a 4th class municipality in the province of Sorsogon, Philippines. According to the 2020 census, it has a population of 35,297 people. Juban is 22 kilometers (14 mi) from Sorsogon City and 603 kilometers (375 mi) from Manila. It is widely known that Juban was formerly a part of a barrio called "Point Canio", or what is now known as Barangay Lungib of the municipality of Casiguran. Accordingly, between the years 1757 to 1759, Moros successively raided this area.

In addition, between the years 1757 to 1759, Moros successively raided this area. Pedro Basilio, one of the Tribe Leaders residing at Point Canio, led the escape of his constituents in fear of being captured by the Muslim bands. The group traveled by sea in a westward direction and found a good shelter about four kilometers away from their homes. They reached the banks of the Cadac-an River and built homes there to settle for good. This area is now called "Binanuahan", from the root word "Banua"—an Austro-Polynesian word which means land or village. This means that this area served as their village before. However, the Moros continued to raid them, so they moved again towards the east to what they called later "Poblacion" (GOVPH, 2024).

The identification of the Juban district as the setting of this study was anchored on the suitability of the phenomenon wherein students and teachers experienced the negative impact of high heat index in classrooms. The researcher as an immediate authority in the area considered the availability of participants and the existence of the issue. With the synchronization of all the variables, the proponent pursued her study to pave the way for recognizing the resiliency of teachers in the delivery of instruction and the persistence of students for continuous learning.

This present study entitled "*The Lived Experiences of Teachers of Juban District During the High Heat Index: Their Resilience in the Delivery of Instruction*" was anchored on the conclusion that a conducive classroom environment of the 21st century could be attained and could facilitate students learning (Chan & Karla, 2022).

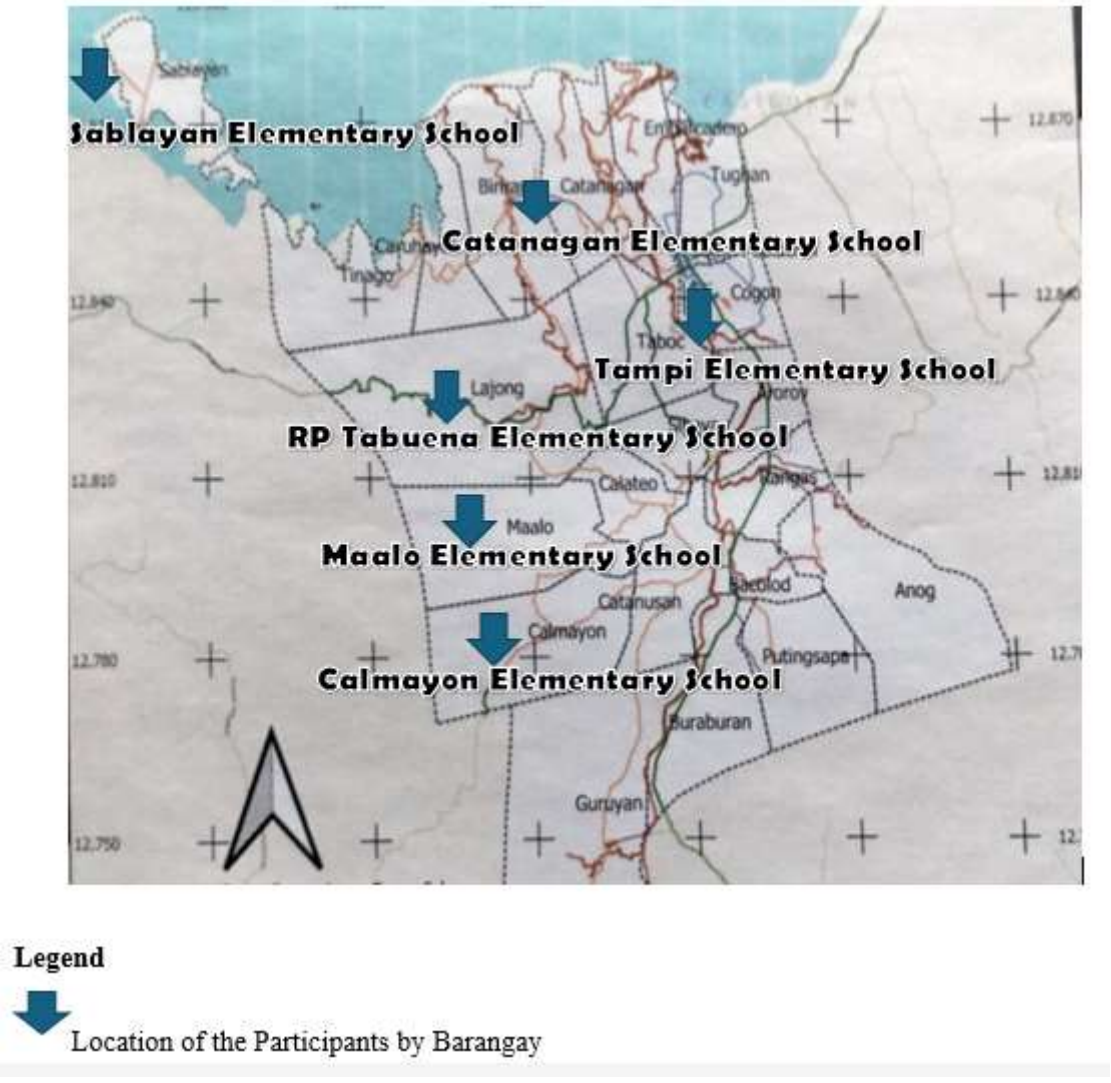

Figure 1
Map of Juban Showing the School Participants

Statement of the Problem

The study delved into the resilience of teachers in the Juban District as they navigate the challenges posed by a high heat index while delivering instruction. It highlighted how these educators adapt their teaching methods and maintain their commitment to student learning despite adverse conditions. The research uncovered the strategies teachers employ to cope with the physical and emotional stress caused by extreme heat, emphasizing their dedication and resourcefulness. Additionally, it explored the support systems and community dynamics that play a crucial role in sustaining their resilience. The findings underscored the importance of understanding the lived experiences of teachers in challenging environments to inform policies and practices that enhance their well-being and effectiveness.

1. How do teachers in the Juban District perceive the impact of the high heat index on their instructional delivery?
2. What strategies do teachers employ to manage the physical and emotional stress associated with teaching in high-heat conditions?

3. How do teachers adapt their instructional methods to maintain student engagement and learning outcomes during periods of extreme heat?
4. What role do support systems and community dynamics play in helping teachers cope with the challenges of a high heat index?
5. How do teachers' experiences with high-heat conditions influence their overall well-being and professional resilience?
6. What mitigating measures can be employed by teachers during high index to continue meeting classroom instructions?

Assumption

The conduct of this study enables the researcher to draw suppositions that could be of significance to the completion of this book. Furthermore, the assumptions below are presented chronologically based on how problems were studied.

1. Juban teachers perceived the impact of a high heat index on their instructional delivery as challenging yet still rewarding and meaningful.
2. The participants employed various strategies in teaching amidst high heat index conditions such as using technology in teaching and providing engaging and interactive activities.
3. Teachers considered that effective and relevant instructional materials are given to the learners together with updated assessment tools to ensure that learning gaps are avoided. In addition, teachers provided remedial and enhancement activities during periods of extreme heat.
4. In helping teachers coped with the challenges of the high heat index, internal and external stakeholders worked hand in hand to ensure the safety and comfort of learners during teaching and learning encounters.
5. Teachers' experiences during high heat conditions impacted their well-being and professional resilience positively since those involvements shaped them to be more resourceful, skillful, and committed in their work to serve the clientele at all times even during untoward situations.
6. Some of the mitigating measures used by teachers during high heat conditions were putting up colling systems such as sufficient electric fans and keeping classrooms well-ventilated, fresh, and clutter-free.

Scope and Delimitation

This study explored the lived experiences of elementary teachers of Juban District in the province of Sorsogon and their resilience in the delivery of instruction during the high heat index. In addition, this paper also delved deeper into the strategies and methods employed by teachers to manage high heat index (HHI). Furthermore, this proposal determined the role of support systems and community dynamics to aid teachers coped with the challenges and safeguard their over-all well-being and professional resilience, Significantly, it also identified the mitigating measures teachers currently take to lessen the effects of extreme heat on classrooms and learners.

The participants in this phenomenological study included twenty (20) elementary teachers from clustered schools in Juban district. The selection of these contributors in the completion of this study was fastened on the accessibility and familiarity of the researcher in the said area of which the latter is a cluster head.

Furthermore, this study was delimited to the use of face-to-face interviews and focus-group-discussion guide questions to collect truthful and relevant narratives from the participants. Additionally, theming and coding were utilized in this study to present, analyze, and interpret data gathered from the participants of this study.

Finally, this study excluded the participation of school heads and secondary teachers in Juban district and other districts in Sorsogon province. Meanwhile, other aspects of the phenomenon were covered in this present study such as the effectiveness of school leaders in handling issues that confront students' and teachers' safety and security.

Significance of the Study

This paper provided rich and meaningful insights to individuals, groups, and entities who have concerns about empowering learners, thereby providing the latter with opportunities for their growth and progress. Additionally, this study is beneficial to the following:

Department of Education. The results and findings of this study may give insights to the Department of Education to intensify the implementation of purposeful and valuable projects that would support teaching-learning encounters in school set-ups. This proposal could also provide substantial feedback to efficiently and effectively handle problems related to classroom management and or building well-ventilated classroom buildings. Furthermore, this agency may intensify its mission to develop holistic individuals where their rights are valued and prioritized.

School Administrators. School administrators could gain insights from this study in the sense that this would serve as the basis for developing programs and curricula that will address issues regarding classroom management including how to address the ill effects of high heat index. The findings of this study could be adopted and implemented to lessen or solve problems relative to waste.

Teachers. This study may motivate them to strengthen their support in achieving harmonious relationships with internal and external stakeholders for the welfare of the students. As the immediate authority in the classrooms, teachers' perspectives are crucial since they have experienced and observed what is the real scenarios in the field. Their thoughts on the issue are indispensable, factual, and relevant.

Students. The conclusive findings of this study could help learners be aware of issues that confront them, specifically those that have an impact on their learning. This may further enlighten them to reinforce their participation in meaningful activities and programs that would lessen or reduce the negative effect of high heat index in classrooms.

Community. This study could make the locality aware of the benefits and opportunities in participating and contributing solutions to existing problems in schools where their children are staying. Moreover, this study may develop communities that prioritize the well-being of teachers who played significant parts in learners' lives and of students who are the next generation of workforce and assets of the country.

Researchers. Insights gained from this study could be a good avenue for future research. This study would identify opportunities for improvement and reference in conducting research relative to understanding how a high heat index impacts internal stakeholders. In the same manner, researchers could utilize this book in conceptualizing topics for research while considering the uniqueness of the new ones from this present book.

Definition of Terms

The following terminologies were significantly used in this study. In essence, they were defined conceptually and operationally for a better understanding and full grasp of the variables in this study.

Exploring the Lived Experiences. This terminology pertains to the depiction of a person's experiences and decisions, as well as the knowledge gained from these experiences and choices that is commonly used when describing a type of qualitative study that includes studies on culture and society, as well as, linguistics and communication (Talking HealthTec, 2022). In this study, this refers to discovering personal

accounts of twenty (20) elementary teachers from Juban district related to the onslaught of high heat index and its impact on the teaching and learning process.

Lived Experiences. This term refers to an individual's personal and subjective encounters, including emotions, perceptions, preferences, and goals, that shape their inner world at a specific point in time. (Sciencedirect, 2025) In this study, this refers to the real-life experiences of elementary teachers regarding the onslaught of high heat index last school-year 2023-2024.

High Heat Index. This term refers to the measure of how it feels outside, when humidity and other factors are considered along with the temperature which includes the amount of moisture or humidity that is in the air, and that moisture or humidity can make the air temperature feel even higher (Jimenez, 2023). In this study, this terminology means the discomfort felt and experienced by teachers and students brought about by too much heat inside the classrooms.

Challenges. This word is defined as difficult tasks or situations that require effort, skill, or determination to overcome or achieve which often involve obstacles, setbacks, or complexities that test a person's abilities, knowledge, or resilience1 (definition.net, 2014). This book pertains to the tough and unfavorable experiences encountered by teachers and students in the Juban district due to excessive heat inside the classroom.

Resiliency. This term means the ability to cope with and recover from setbacks, commonly displayed with calm in the face of disaster (Cherry, 2023). In this study, this word pertains to the ability of teachers in Juban district to continuously deliver instruction to learners amidst the ill effects of high heat index in classrooms.

Delivery of Instruction. This terminology refers to essential practices that teachers master for effectively instructing students to maximize knowledge and skill acquisition to produce desirable results (The Wing Institute, 2024). In this study, this means teachers' capabilities to teach classes and provide learning activities to learners despite restlessness brought by extreme heat conditions while teaching.

Chapter II
RELATED LITERATURE AND STUDY

The researcher reviewed several literature and studies related to the present study to provide relevant and timely insights about the chosen phenomenon. Likewise, summarizing the existing knowledge would guide the researcher on the framework of this study. The reviews of the available articles and research are presented hereunder.

The Impact of High Heat Index on Instructional Delivery

Meanwhile, the study of Cho (2017) analyzed the effect of summer heat on academic achievement. Summer heat can negatively affect student learning, as previous studies have shown that high temperatures in laboratory settings harm cognitive abilities. Moreover, summer heat negatively affected student test scores. Specifically, an additional day with a maximum daily temperature exceeding 34 °C (93.2 °F) during the summer, relative to a day with a maximum temperature between 28 °C (82.4 °F) and 30 °C (86 °F), decreased the scores of math and English tests by 0.0042 and 0.0064 standard deviations, respectively. Hernando-Malipot (2024) had reported that teacher Nur of Cotabato City emphasized the importance of protecting the health of both students and staff during this hot season. She recommended water breaks in each lesson to keep children hydrated, ensuring well-ventilated rooms, avoiding afternoon classes, and scheduling modular lessons whenever possible, especially during peak heatwaves.

Significantly, the three themes discussed above conformed with the report of Will (2022) exposing that cumulative heat exposure decreases the productivity of instructional time—without school air conditioning, the year's learning decreases by one percent for every one percent increase in hotness. In addition, she reported that exams for 3rd to 8th graders found that the impact of heat on mathematics achievement is about three times larger than its impact on achievement in English/language arts. These data suggested that HHI has a massive effect on the performance of the learners inside the classroom.

Furthermore, Boix et al (2021) investigated how temperature, inside and outside the classroom, influences teachers' mood and mental fatigue as well as the perceived students' behavior. Mood, mental fatigue, and perception of students' behavior were evaluated by the teachers. Results showed that indoor temperature, indoor humidity, and the difference between outdoor/indoor temperature significantly explain a worse perception of the mood of the teachers and a worse perception of students' behavior that influences the perception of students' behavior.

Moreover, Preña and Labayo (2024) identified policy measures implemented by government agencies to mitigate the adverse effects on students and teachers, including face-to-face class suspensions, shifts to alternative instructional methods, adjusted class schedules, and discussions on returning to the traditional school calendar. The establishment of heat response plans for educational institutions and the development of improved location-specific heat indices are essential to adapt to this new climate reality and minimize the disruption of educational activities.

Interestingly, the impact of HHI on the teachers which was elaborated in the themes above is affirmed by Valerio (2024) emphasizing that this discomfort leads to heat-related illnesses such as heat exhaustion and dehydration. Also, she pointed out that teachers may struggle to concentrate and perform their duties inside the classroom.

Similarly, a survey in March 2024 among teachers in Manila found that intense heat in classrooms affects students' ability to concentrate. This underscores how immediate temperatures in Philippine classrooms during the summer months have become detrimental to student learning. (Preña &Labayo, 2024)

Likewise, incorporating interactive and engaging teaching methods could help mitigate the effects of high heat index levels on student motivation and participation. Utilizing multimedia presentations, group activities, and hands-on learning experiences could provide a welcome diversion from the heat and keep students actively engaged in the discussion process. Additionally, integrating movement breaks and incorporating outdoor learning opportunities offered a refreshing change of scenery and help students stay energized and focused (Ortiz, 2024).

In essence, Pinuga (2024) supported this result confirming that the adverse effects of a hot classroom extend beyond academic development. Heat affected students' social and emotional well-being, making it harder to concentrate, increasing impulsiveness, and even raising the likelihood of aggression. It also presented serious health risks, potentially worsening existing health issues such as asthma or heart conditions. This led to increased absenteeism, further compromising student progress.

The above concept was interrelated with the study of Rony & Alamgir (2023) who stressed that heat-induced stress could impair cognitive function, affecting memory, attention, and decision-making abilities. Prolonged exposure to high temperatures could trigger a stress response in the body, leading to the release of stress hormones such as cortisol. Elevated cortisol levels impaired cognitive processes, including memory formation, attention span, and complex problem-solving. Heat-induced cognitive impairments hindered daily tasks, exacerbate stress, and contribute to a sense of mental strain and frustration.

Interestingly, Davies (2024) stated that when the heat index rises staying inside to work on crafts, reading, or playing board games makes the most sense. She also pointed out to plan ahead if there will be several days of high heat in a row, think of creative ways to have kids switch up their activities and avoid restless and irritable feelings, and help them stay active,

In India, a study conducted by Lala and Hagishima (2023) who gathered data from the field survey to understand classroom experiences and challenges encountered by children and teachers during heat waves. It underscored several aspects of students' vulnerability to heat exposure and its adverse impact on their health, such as absence from school, physical symptoms of heat distress, etc. Furthermore, it highlighted the pressing need for classroom heat risk management in light of climate change and makes several policy prescriptions in primary schools.

Matson (2021) disclosed that in a 2014' study both excessively cold and hot temperatures directly affect students' learning ability. High school students scored an average of 76 percent when it was 61°F, and did worse when it was 81°F, scoring an average of 72 percent. When it was 72°F, which many considered a comfortable temperature, students' average scores went up to 90 percent. The researchers noted that when the body is subjected to thermal discomfort, a person's brain will be distracted by signals from the body. When students were in an environment that is hot or cold, maintaining homeostasis became the mind and body's priority, making it harder to concentrate on schoolwork.

Remarkably, the Cen et al. (2024) study conformed with the above result asserting that fan-assisted cooling strategies are widely employed in tropical climates due to their energy-saving benefits while ensuring thermal comfort through increased air temperature and air velocity. Their study observed a significant impact of classroom thermal conditions on students' cognitive performance. It was found in both schools that students' cognitive performance scores decreased significantly with increased temperature and decreased air velocity. Additionally, students' cognitive performance decreased by 9.2 % and 18.1 % in slightly warm and warm sensations, respectively, compared to the neutral sensation. These findings underscored the significance of air velocity as a crucial factor in the design of classroom environments, particularly in tropical climates, to enhance students' thermal comfort and optimize their cognitive performance.

In essence, Wargocki et al. (2019)' study was interrelated to this recent study since both investigated the effects of temperature in school classrooms on children's performance in school. The cited authors confirmed that there is a significant relationship between the performance of learners in psychological tests and school tasks which can be expected to increase on average by 20% if classroom temperatures are lowered from 30°C to 20°C and that the temperature for optimal performance was lower than 22°C.

Additionally, the impact of HHI was discussed by De la Pena (2024) who emphasized that teachers described the intensity of heat they had experienced in recent days, especially with the heat index, or the level of discomfort a person experiences because of the combined effects of temperature and air humidity, reaching extremely high levels. Navigating high heat index levels during face-to-face classroom discussions required a proactive and adaptive approach to ensure the well-being and productivity of students and educators. By prioritizing hydration, optimizing ventilation, incorporating interactive teaching methods, and being vigilant for signs of heat-related illness, educators created a supportive learning environment that promotes student success even during sweltering conditions (Ortiz, 2024).

Accordingly, Stoler & Park (2020) pointed out that among high school students, as temperatures rise, standardized test scores and rates of learning tend to fall. Heat could not only impact standardized test scores but can also have serious implications for the real world. Increased heat on test day reduced the

likelihood that a student will graduate from high school, and the disruptive effects of hotter school days on learning appear to be tripled for Black, Hispanic, and low-income students. Adapting to climate change's impacts would likely require a wide array of evidence-based solutions. In the case of heat's effects on learning, air conditioning appeared to alleviate most of the adverse impacts. However, there was a distributional issue. Though air conditioning may be an effective tool for climate adaptation, Black and Hispanic students appeared less likely to have access to it in their schools and homes, leaving them potentially more vulnerable to rising temperatures.

In addition, the study by Boholano & Jamon (2021), they reiterated that teachers are important figures in schools. They had also their narratives during this COVID–19 pandemic. Education in the new normal needs a lot of adjustments since teachers were not well-equipped when the pandemic came. The study utilized the qualitative phenomenological research design. Based on the findings, eight themes emerged from the lived experiences of teachers which are: (1)technologically literate 21st-century teachers; (2) Collaboration, Commitment, and Competence (3Cs) critical skill and values; (3) the need for the new normal pedagogies; (4) difficult to monitor, feedback, and assess learning; (5) online and offline platforms, applications, software as support; (6) acquired skills in writing modules and Self-Learning Kits; (7) reaching out to students and parents a challenge; and (8) Covid 19 a threat in the workplace. It was concluded that teachers showed resilience despite the weaknesses and threats and translated those into strengths and opportunities.

Significantly, Obiar (2024) stressed that academic performance was a crucial aspect that measures student achievement in various academic subjects. It was typically assessed through classroom performance, graduation rates, and results from standardized tests and projects. However, the current issue of extreme heat due to climate change had impacted students' academic performance negatively. These extreme heat events posed serious health risks such as heat-related illnesses and even fatalities. Moreover, the impact of extreme heat on academic performance was evident, especially in countries like the Philippines where millions of children are affected by high heat frequency and prolonged heatwaves. The projections for the future indicated a worsening situation by 2050, with severe consequences for health, safety, nutrition, education, access to water, and livelihoods. Addressing climate change was not only crucial for environmental sustainability but also for safeguarding the well-being and academic success of current and future generations. The urgency to combat climate change and mitigate its effects had never been more pressing. The accustomed way of Filipino school year usually ends in March, whereas the vacation typically starts in April and May, the summer season in the Philippines. But due to the pandemic, some things had changed which led us to the creation of the new normal society. Two years have passed since students were in modular learning where they studied inside their houses which was caused by the new normal.

Meanwhile, *The Real Impact of Rising Heat on Learners and Teachers*, 2024 exposed that the Department of Education (DepEd) announced the cancellation of classes in several areas on Monday, April 1, which underscored the severity of the situation. In some places, such as Iloilo City, the Local Government Unit (LGU) declared that the suspension of classes is effective until April 2. However, alternative modes of learning would be utilized as a precautionary measure. Schools were advised to make necessary adjustments for students to ensure safety and effective learning in these hot environments. However, ACT-NCR Union President Ruby Bernardo highlighted that while these suggestions could be useful as an immediate response and may provide temporary relief to those who were affected, they should not substitute long-term solutions. Building well-ventilated and adequate numbers of classrooms, hiring more

teachers and support personnel, and establishing climate-resilient environments were crucial for improving learning conditions in schools. This necessitated the proper allocation of budget and resources from the government.

Strategies for Teachers' Comfort During High Heat

Furthermore, Valerio (2024) pointed out the need to address the challenges posed by the heat index since they require proactive adaptation and mitigation strategies at both the institutional and policy levels. Investing in climate-resilient infrastructure and sustainable design practices for schools was essential to creating comfortable, safe learning environments, and implementing heat safety protocols.

In line with this, Bordey (2024) reported that the Division of City Schools of Manila has allowed teachers and students to wear comfortable clothes amid the sweltering heat on campuses. According to Division Memorandum No. 123, series of 2024, teachers and students could wear more comfortable clothing aside from their regular uniforms to reduce the heat they feel while inside the schools.

Meanwhile, Hagerman (2024) explained that the federal Occupational Health and Safety Administration (OSHA) standard to protect workers from heat had been in the works for years. OSHA asked for feedback and many educators offered perspectives. According to them, illness was preventable: listening to workers to develop a heat prevention plan and enacting measures like paid breaks in cool spaces, access to water, and limiting time exposed to heat will save lives and make work more productive and safer. In line with the given accounts, Wickerson et al. (2024) highlighted the positive attitudes and actions by the federal agencies in the United States where there was a need to collaborate and collect data to better understand and drive mitigation efforts to prepare for extreme heat for schools. They believed that opportunities exist across the federal government to protect the nation's future by protecting the children. Federal agencies could best support state and local schools through three paths of mitigation: collect data and collaborate, set policy, and invest in schools.

By prioritizing hydration, optimizing ventilation, incorporating interactive teaching methods, and being vigilant for signs of heat-related illness, educators could create a supportive learning environment that promotes student success even during sweltering conditions. (Will, 2024)

Shortridge's (2024) study served as a starting point for creating and operationalizing an evaluation rubric for schools, community partners, health departments, and researchers to use for smaller-scale heat preparedness efforts. Efforts to make schools heat-ready were an essential step towards ensuring that future generations had access to comfortable and safe learning environments without risks associated with heat exposure, even as temperatures rose in cities across the globe. In connection, the Philippine Red Cross (PRC) reminded the public including the school learners to stay hydrated and in well-ventilated areas to avoid the effects and dangers of heat indexes consistently recorded in the previous days of April (Sarao, 2024). Significantly, the Division of City Schools of Manila allowed teachers and students to wear comfortable clothes amid the sweltering heat on campuses. According to Division Memorandum No. 123, series of 2024, teachers and students could wear more comfortable clothing aside from their regular uniforms to reduce the heat they feel while inside the schools (Bordey, 2024)

It was good to note that Nidhi et al., (2023) revealed that in Phoenix, which recorded daily highs at or above 110 F for 31 consecutive days in July, the daily heat index was also carefully monitored by schools. Under certain heat index conditions, students are restricted from outdoor activity and teachers stay on high alert for signs of heat stress in students. Also, at Dunbar Elementary School in downtown Phoenix, hot days mean having free time to use the school's air-conditioned science, technology, engineering, arts, and mathematics laboratory. The school also offered planned activities, such as dancing, games, and more, in

its gymnasium on extreme heat days. Hot classrooms can be detrimental to both student health and education.

In the same wavelength, Cariaso (2023) stated that aside from the shift to distance learning, the Teachers' Dignity Coalition (TDC) pushed for shortened teaching time and smaller class sizes to address the extreme heat during summer. In a statement, TDC chairman Benjo Basas acknowledged a recent memorandum issued by the Department of Education (DepEd), which reiterated its policy of suspending in-person classes during unfavorable weather conditions. An immediate shift to the old calendar, he pointed out, could affect the two-month break for teachers and students. *"A more strategic approach is needed, for example, a class size of no more than 25 students, more stable classrooms designed for student comfort and provision of electric fans or even air-conditioning system. Certainly, we will need funds and policies to implement such,*" he added.

In line with this, Davies (2024) provided some tips to keep kids safe during high heat index. He mentioned that light-colored clothing can help kids stay cool and prevent heat stress from excessive heat absorption; darker-colored clothes typically provide slightly better sun protection. Also, loose-fitting clothing offered both adequate ventilation and protection against direct sun exposure. Clothing made with just one layer of absorbent material can help maximize the evaporation of sweat, which has a cooling effect. Moreover, planning for extra rest time should be considered to fight tiredness and irritability.

To support the need to adjust lessons and activities, Casucian (2024) wrote that the city of Makati has announced changes that will be implemented on class schedules following the consistently high level of Heat Index in Metro Manila. According to the "24 Oras" report by Tina Panganiban-Perez on Wednesday, classes in public schools in Makati City had been adjusted to 6 a.m. to 10 a.m. for morning classes and 3:30 p.m. to 7:30 p.m. for afternoon classes.

Some salient concepts on HHI were presented by Cabico (2023) attesting that the Department of Health (DOH) reminded teachers and students about the impacts of summer heat on their health as well as the conduct of classroom learning. In a briefing, Health officer-in-charge Maria Rosario Vergeire urged parents and students to remind children to drink water often, make children wear light clothes so they are comfortable, do not go or play outside when sunlight is intense, and always bring an umbrella. She also reminded teachers and school personnel to open windows and doors of classrooms and turn on fans during classes.

In connection to the effects of high heat index on the teaching-learning process of the teachers, Lala & Hagishima (2023) emphasized that children in developing countries such as India will experience severe consequences of climate change. Primary school students, in particular, were the most vulnerable to extreme weather conditions, such as heat waves intensifying due to climate change. This adversely impaired their development, well-being, and learning outcomes. However, significant research gaps existed in understanding and mitigating children's vulnerabilities. There was an urgent need for a deeper understanding of the impact of heat waves on children's health and well-being in India. Further, the discussion on the state of heat safety in Indian primary schools was limited. It underscored several aspects of students' vulnerability to heat exposure and its adverse impact on their health, such as absence from school, physical symptoms of heat distress, etc. Furthermore, it highlighted the pressing need for classroom heat risk management in light of climate change and made several policy prescriptions in primary schools.

Moreover, Shortridge (2022) described that the current landscape of heat safety culture in schools had received little attention in the literature. This study set out to 1) improve understanding of heat perceptions,

reactions and actions, and heat safety recommendations of key stakeholders, and 2) identify themes from expert stakeholder responses to gauge the effectiveness of their heat preparedness levels in their current school environment. These objectives were focused on school heat readiness and child heat vulnerability in Phoenix, Arizona, USA. Findings demonstrated that 1) heat safety resources were available but not fully utilized within the schools, 2) expert opinions supported extreme heat readiness plans accounting for site-specific needs, particularly education, and 3) students were negatively impacted by extreme heat, whether direct or indirect, both inside and outside the classroom.

Remarkably, De la Peña (2024) explained that according to data from the Philippine Atmospheric, Geophysical and Astronomical Services Administration (Pagasa), the heat index hit 46ºC in Daet, Camarines Norte on Sunday, Feb. 7. The day before, the highest level was recorded in Puerto Princesa City, Palawan, with the heat index reaching 44ºC. This prompted the Department of Education (DepEd) to reiterate its Department Order No. 037, which was released in 2022, saying that in light of severe heat, school officials have the discretion to suspend in-person classes and shift to alternative modes. It said symptoms of heat-related illnesses include heavy sweating, exhaustion, dizziness, blackout, weak but fast pulse, feeling of nausea, and vomiting, mostly as a result of prolonged exposure to heat, exhausting activities in warm weather, weak immune system, high humidity, obesity, chronic alcoholism, and even age (for the elderly and infants).

Concerning the above-cited study, Neeth et al., (2024) revealed that the increasing frequency and intensity of heat waves due to climate change pose a potential threat to the health and well-being of individuals, particularly school students. As schools were essential environments for cognitive and physical development, understanding the impact of heat on students' health is crucial. Data extraction involved the categorization of findings based on health outcomes, study designs, and geographical locations. Multifaceted health impacts of heat on school students, encompassing physiological, cognitive, and behavioral domains were reported. Heat cramps, heat exhaustion, and heat stroke were the most common Heat heat-related illnesses reported followed by compromised cognitive performance, tiredness, low concentration, and sleepiness impacting their mood and energy levels.

Navigating Hot Days: Teacher Adaptations to Lesson Plans

Significantly, Ortiz (2024) highlighted that navigating high heat index levels during face-to-face classroom discussions required a proactive and adaptive approach to ensure the well-being and productivity of students and educators. By prioritizing hydration, optimizing ventilation, incorporating interactive teaching methods, and being vigilant for signs of heat-related illness, educators created a supportive learning environment that promotes student success even during sweltering conditions. Meanwhile, Davies (2024) stated that when the heat index rose staying inside to work on crafts, reading, or playing board games makes the most sense. She also pointed out to plan ahead if there would be several days of high heat in a row, think of creative ways to have kids switch up their activities and avoid restless and irritable feelings, and help them stay active,

The five key themes obtained from participants' responses have emphasized the views shared by Hernando-Malipot (2024) that water breaks in each lesson should be observed to keep children hydrated. Moreover, ensuring well-ventilated rooms, and avoiding afternoon classes must be considered. Also, scheduling modular lessons whenever possible, especially during peak heat waves was encouraged.

Furthermore, Will (2022) reiterated that some schools dismissed students early during extreme heat, and others cancel classes entirely. His research suggested that school districts cancelled school for heat an estimated average of six or seven days per year—up from three or four days a decade ago. Consequently,

Yale Porvu Center for Teaching and Learning (2024) claimed that instructors could improve student motivation and engagement by making visible opportunities to close gaps between current and desired performance, especially during situations that entail adjustments of both teachers and learners. Examples of these included opportunities for resubmission, specific action points for writing or task-based assignments, and sharing study or process strategies that an instructor would use to succeed.

In addition, the effective use of digital learning tools in classrooms increased student engagement, helped teachers improve their lesson plans, and facilitated personalized learning. It also helped students build essential 21st-century skills. Virtual classrooms, video, augmented reality, and other technology tools could not only make classes livelier; they could also create more inclusive learning environments that foster collaboration and inquisitiveness and enabled teachers to collect data on student performance. Still, it's important to note that technology is a tool used in education and not an end in itself. The promise of educational technology lies in what educators do with it and how it is used to best support their students' needs. (American University Washington D.C., 2020) Furthermore, the benefit of positive feedback was creating a positive cycle of behavior. When people receive positive feedback, they were more likely to continue performing well, leading to even more positive feedback. This cycle of positivity could lead to a more positive work or learning environment, leading to higher levels of success and satisfaction even during unpleasant conditions like high heat index in classrooms. (Impact Futures, 2024)

In the Philippines, there was a need for action to deal with extreme heat inside the classrooms now and soon, including the start of the next school year. Among the recommendations presented by teachers' groups were: the building of adequate classrooms with proper ventilation, avoiding large classes that cause overcrowding, hiring more support personnel like health workers who will manage in-school health facilities, and providing more water fountains around the school. (Manila Bulletin, 2024)

In essence, Chitrakar & P.M. (2023)' study restated that frustrating situation impacts students learning. Nowadays students were more frustrated due to academic pressures, persistent challenges or obstacles in their studies, etc. These situations led to mental stress, lack of motivation, decreased self-esteem, and a decline in academic achievement among students. Frustration among students were common nowadays and to make them motivated and successful were part of the tasks endowed to teachers.

Feedback improved the learning experience for the students and this has also a significant effect on professionalizing teaching. However, feedback wass considered a difficult issue when it is unable to satisfy the students in improving their learning experience. That is why teachers must re-think about the feedback-providing process. They should avoid the traditional way of providing feedback to the students which sounds negative and hurtful. (Bashir, Kabir, & Rahman, 2016)

Interestingly, Grandvaux 2024 UNICEF estimated that almost half of the world's 2.2 billion children lived in countries that were at "extremely high risk" due to the effects of climate change (such as record high temperatures, coastal flooding, drought, and pollution), but no educational system on the planet had been spared these impacts. Hot classrooms impaired cognitive development, reducing learners' ability to concentrate process, and retain information. Test scores dropped as the thermometer rose, as found by the Program for International Student Assessment, which measured the scholastic performance of 15-year-olds around the world.

To back up this study, Chi (2023) restated that according to the results of a survey of 11,706 public school teachers from March 24 to 27, most lessons were also held in congested classrooms, posing severe difficulties for students with medical conditions as summer rolls in. Around 67%, or around 7,800 teachers who answered the survey, said that they experienced "intolerable heat" in their classrooms, with the most

commonly reported result being students' difficulty paying attention to lessons (86.6% or 10,140 respondents).

In the same manner, Reliefweb (2024) mentioned that according to some teachers from Eastern Samar and Cotabato City, the oppressive temperature in the classroom is bad for students' health, focus, and the entire learning experience. *"Several of our students are suffering with colds and coughs. If the heat wave persists, we will need to adopt modular learning so that the children can wear light and stay hydrated at home."* Teacher Geralyn stated. Children and youth advocates expressed concern about climate change's impact on their education and quality of life. Teacher Perla suggested that schools prepare for El Niño by providing potable water in each classroom. She noticed that the classrooms lacked enough ventilation, and a rising heat wave could make children restless, unable to concentrate, and feeling ill.

About the above-cited statements, Dong et al., (2023) discussed the impact of climate change on the cognitive performance of children in English school. Children in England spent around 30% of their time in school to gain knowledge and skills. Climate change impacted schools' thermal environments and children's learning performance by impairing their cognitive ability. This study presented an evaluation approach to investigating and quantifying climate change's impact on the cognitive performance of children across English school stocks. The study also evaluated the potential of possible strategies for mitigating the impacts of climate change. The results showed that future climates are projected to increase cognitive performance loss of children in school archetypes representative of school stocks, with variations based on regional climate characteristics. Increasing ventilation rates proved to be an effective means of reducing cognitive performance loss, while its effectiveness diminishes as outdoor temperatures rise in the future. Thus, the introduction of air conditioning became a potentially more beneficial strategy, despite the associated increase in cooling energy demand.

Supporting Teachers in Times of High Heat: Strategies from School Heads

In line with this, Sylvester's (2019) findings showed that heat waves, accommodation conditions, social, learning, and physical environment significantly affect students learning among university students in summer. His study recommended that the government should ensure building engineers equip each room in an apartment with air conditioning and solar panels to ease the payment of electricity for students.

Interestingly, Hagerman (2024) explained that the federal Occupational Health and Safety Administration (OSHA) standard to protect workers from heat has been in the works for years. OSHA asked for feedback and many educators offered perspectives. According to them, illness was preventable: listening to workers to develop a heat prevention plan and enacting measures like paid breaks in cool spaces, access to water, and limiting time exposed to heat will save lives and make work more productive and safer,

Likewise, Bordey (2024) reported that the Division of City Schools of Manila has allowed teachers and students to wear comfortable clothes amid the sweltering heat on campuses. According to Division Memorandum No. 123, series of 2024, teachers and students could wear more comfortable clothing aside from their regular uniforms to reduce the heat they feel while inside the schools.

Additionally, Navarro (2024) addressed those corporations, governments, and individuals must put into practice effective methods to reduce high heat index and prepare for mitigation. The promotion of sustainable practices depended heavily on awareness-raising initiatives and education. Education and awareness-raising campaigns were also crucial in building public support and encouraging sustainable behaviors. Every person has a part to play in the fight against global warming and preserving the environment for coming generations, from cutting back on energy use and supporting climate-friendly legislation to combat high heat index which impacts learning among students.

Meanwhile, students should use large fans connected to generators or nearby power sources to circulate airflow in the classroom. This didn't cool the air down, but it could provide a refreshing breeze in hot conditions. Airflow could also improve breathing conditions and help teachers and students stay energized. It is important to rest in air-conditioned areas to give time to cool down as the lesson unfolds in a day. (Indeed Editorial Team, 2023)

Accordingly, Jackson (2022) pointed out that support system could come from educators, parents, guardians, or other trusted adults. When students feel supported, they were more likely to take risks and try new things. Students who felt supported were also more likely to feel confident in their abilities. This confidence was essential for students as they began to navigate the world of work. There were many ways that educators could provide social and emotional support to their students.

In essence, Memorandum No. 140 s. 2024 dated April 8, Division of City Schools (DCS) Manila Chief Education Supervisor Nerissa Lomeda said in-person classes would only be from 6 a.m. to 12 noon for over six weeks, from April 11 to May 28 in both elementary and secondary schools. Under the scheme, morning and afternoon shifts should take turns holding in-person classes during this period. (Patinio, 2024)

Significantly, schools played a vital role in providing a cool environment for learning during heatwaves. Well-maintained air conditioning units were ideal, but proper ventilation with fans and open windows could also help. Also, encouraging students to dress appropriately in loose-fitting clothing or light-colored clothing and bring reusable water bottles to stay hydrated throughout the day for heat safety were helpful ways during HHI. The local health department discouraged hot classrooms from operating. (Chan, 2024)

Community awareness campaigns helped parents and community members understand the benefits of their involvement with their local schools. They also informed community members about the different levels and types of involvement opportunities, policies, and programs. When students felt that they do not belong to a strong community, it could negatively affect their learning experience—and their attendance rates. (Daly, 2024)

Significantly, heat reduced working productivity and increase the risk of accidents. It was difficult to complete work or learning in very hot weather and heatwaves may lead schools and other institutions to close. Heatwaves could also be associated with hazardous air pollution events. During the day when outdoor temperatures are higher than indoors, close windows and cover them with blinds or shutters to block direct sunlight. Turn off as many electrical devices as possible. Use electric fans only when temperatures are below 40 ˚C / 104 ˚F. In temperatures above 40 ˚C / 104 ˚F, fans will heat the body. (World Health Organization, 2024)

In times of crisis, Valenzuela (2022) emphasized that taking care of teachers should be of utmost priority for school administrators. They needed to rally teachers in ways that don't seem insincere or with an agenda to have them comply. That said, school leaders must consider the best ways of supporting their teachers who are staying in the profession by choice and new colleagues entering a potentially tricky new job situation.

In the same manner, Cabico (2023) attested that the Department of Health (DOH) reminded teachers and students about the impacts of summer heat on their health as well as the conduct of classroom learning. In a briefing, Health officer-in-charge Maria Rosario Vergeire urged parents and students to remind children to drink water often, make children wear light clothes so they are comfortable, do not go or play outside when sunlight is intense, and always bring an umbrella. She also reminded teachers and school personnel to open windows and doors of classrooms and turn on fans during classes.

Accordingly, heat-related problems brought about by high heat conditions occur through several pathways:

A major rise in body temperature, due to a build-up of heat, led to conditions such as heat exhaustion, and eventually heat stroke, which is a medical emergency. Also, the redirection of blood flow to the skin meant that the heart must work harder than normal. The strain on the heart caused problems for people with existing heart conditions. Likewise, an increase in sweating led to dehydration if fluid loss is not replaced by drinking enough. Finally, dehydration caused weakness and fainting, lead to kidney problems, and worsen other medical conditions. (Better Health, 2024)

Similarly, Dogan (2024) pointed out that the health effects of extreme heat include dizziness, fainting, sleep disruption, breathing difficulties, heat exhaustion, heart attacks and kidney damage. In severe cases, extreme heat can lead to heatstroke (when the body temperature rises above 40°C), organ failure, and even death. There were also indirect health impacts of extreme heat – including an increased risk of accidents, exposure to air pollution, food insecurity, and the rising spread of some infectious diseases.

Meanwhile, Felisilda (2023) stated that the global pandemic of 2020 has altered how public-school teachers work and manage their time, including teaching, engaging with students, conducting research, and collaborating with colleagues. Basic education delivery has shifted significantly to the distance (via online classes and modular), and workspaces have shifted to the home, which has doubled their struggles. Likewise, her study revealed that there was a significant relationship between the respondents' resilience and well-being before and following the pandemic. Based on the findings, today's public-school teachers still have a foundation of well-being; even amid a pandemic, they were still striving to achieve their set goals for themselves, and they were in good condition in terms of the various aspects of their well-being; however, extensive research studies must be conducted to represent the entire division. Hence, it was recommended that schools also conduct a proactive professional development seminar discussing self-regulation in post-pandemic education to strengthen and adapt strategies that would help teachers in their classes.

Furthermore, Hascher & Mansfield (2021) expressed the search for a deeper understanding of the important role of wellbeing and resilience in the teaching profession, and of the mechanisms by which they are interrelated. Wellbeing is regarded as of utmost importance for individuals because a long-term absence of well-being can be harmful. Given current concerns about teacher attrition, and the role of health and burnout in teacher retention, there is a need to better understand how to enhance teacher wellbeing as a driving source for personal and professional flourishing. Ultimately, this will contribute to the profession as a whole because it can lead to empowering teachers to care for their students, create positive learning environments, commit to the role of education, and support a learning society.

Likewise, Antonio (2023) deliberated that teachers' traits are fundamental factors that determine how teachers can withstand their motivation and commitment in times of change. Researchers consistently provided evidence of the strong correlation between a teacher's performance with two important traits, resilience, and a sense of self-efficacy. Findings suggested that the majority of the teacher-respondents have a moderately high level of resilience and are proximate to having a high level of resilience. Close results also revealed high levels from three domains of teachers' sense of self-efficacy. The results suggested that teachers are capable of performing student engagement, intellectualizing and executing instructional strategies, and managing online classrooms.

Also, Boon (2021) reflected that schools in Western countries are places where work-related conditions lead to teacher disaffection and attrition. To mitigate this employers and scholars advocate fostering teacher resilience. Resilience is one's ability to manage stressors and maintain adaptive functioning across

all domains of life. Latterly, scholars investigated resilience in teachers, mainly through qualitative or quantitative self-report studies. This research constituted perceived teacher resilience because as formulated, teacher resilience was conceptually flawed, limited in scope, based on teachers' functioning within their professional lives. For an accurate profile of teacher resilience, the researcher studied those still teaching, and teachers who had exited the profession to determine why they left.

The Impact of High Heat on Teachers' Emotional Well-Being and Resilience

In line with this subject, the study of Preña & Labayo (2024) asserted that the exceptionally high temperatures and humidity across almost all parts of the Philippines have created extremely uncomfortable conditions, particularly for teachers and students at all education levels. Beyond discomfort, heat stress can also harm their health, impair their well-being, and reduce productivity.

Meanwhile, Colie & Martin (2016) noted that effective instruction requires adaptation of instructional content and lesson pacing to be responsive to students' differentiated learning needs, changes in the levels of learning support provided to students as they develop expertise in the content, and modification of classroom management strategies to respond to the changing classroom environment. In addition, working in schools requires that teachers can successfully respond to and deal with any changing demands that transpire across the school more broadly. As such, adaptability is a capacity that is of central relevance to teachers' healthy and effective functioning at work.

To support the themes presented, Li's (2023)' study revealed that teacher self-efficacy and resilience exhibited direct and negative associations with teacher burnout. Additionally, an interesting finding emerged were teacher emotion regulation indirectly affected teacher burnout, mediated by teacher resilience. Moreover, the negative connections between teacher self-efficacy, resilience, and burnout highlighted the importance of nurturing these factors to mitigate burnout risk. These outcomes collectively contributed to the understanding of teacher dynamics and suggest potential avenues for targeted interventions.

Furthermore, Barnová et al. (2023)' study confirmed the existence of associations between teacher resilience and years of teaching experience as novice teachers and teachers with ten or fewer years of teaching experience achieved lower scores on the scale than their more experienced colleagues. The findings suggested that years of teaching experience can be considered an important variable from the aspect of teacher resilience and it is important to pay increased attention, especially to novice teachers' well-being and building their resilience by guiding them through developing effective coping strategies.

It is good to note that Nidhi et al., (2023) revealed that in Phoenix, which recorded daily highs at or above 110 F for 31 consecutive days in July, the daily heat index is also carefully monitored by schools. Under certain heat index conditions, students are restricted from outdoor activity and teachers stay on high alert for signs of heat stress in students. Kelly Turner, an associate professor of urban planning and geography at the University of California Los Angeles said physical movement and unstructured free time are necessary components of learning. Also, at Dunbar Elementary School in downtown Phoenix, hot days mean having free time to use the school's air-conditioned science, technology, engineering, arts, and mathematics laboratory. The school also offered planned activities, such as dancing, games, and more, in its gymnasium on extreme heat days. Hot classrooms can be detrimental to both student health and education.

In the same wavelength, Cariaso (2023) stated that aside from the shift to distance learning, the Teachers' Dignity Coalition (TDC) pushed for shortened teaching time and smaller class sizes to address the extreme heat during summer. In a statement, TDC chairman Benjo Basas acknowledged a recent memorandum

issued by the Department of Education (DepEd), which reiterated its policy of suspending in-person classes during unfavorable weather conditions. An immediate shift to the old calendar, he pointed out, could affect the two-month break for teachers and students. *"A more strategic approach is needed, for example, a class size of no more than 25 students, more stable classrooms designed for student comfort and provision of electric fans or even air-conditioning system. Certainly, we will need funds and policies to implement such,"* he added.

Consequently, Rony & Alamgir's 2023 perspective emphasized the significance of recognizing heat stress and its consequences on mental well-being. Chronic heat stress could lead to increased stress, anxiety, and cognitive impairment. Vulnerable populations included the very young, older adults, and individuals with pre-existing mental health conditions. Socioeconomic factors can further exacerbate vulnerability, highlighting the need for tailored strategies to manage mental health challenges during high temperatures. Additionally, the article identified and discussed proactive coping strategies to minimize both the psychological and physical impacts of heat stress. Mindfulness, stress management techniques, and therapy are suggested as effective means for individuals to manage psychological distress.

Mitigating High Heat in Classrooms: Practical Steps by Teachers

Meanwhile, heat exhaustion symptoms included nausea, vomiting, sometimes headaches, and sweating. On heat stroke, people do not perspire they have a high temperature above 40 degrees and they will experience central nervous system disturbances like delirium seizures, a person can pass out. Heat stroke is an emergency case, and when people experience heat exhaustion, they have already addressed it.) She advised people to hydrate by drinking 2-3 liters of water a day, avoid too much exposure to the sun, wear loose clothing, and know the signs and symptoms of heat stroke. (Sun Star Davao Digital, 2024)

Accordingly, modifications involved making substantive adjustments to the curriculum itself, including teaching methods, materials, and assessments, to align with individual student's strengths and challenges. These changes ensured all students can learn in a way that works best for them, promoting a more inclusive and supportive learning environment. (Voyager Sopris Learning, 2024). In essence, teachers should identify which teaching methods would properly support a particular learning outcome. Its effectiveness depends on this alignment. To make the most appropriate choice, teachers should consider learning outcomes, student needs, and the learning environment. Choosing the appropriate teaching method brings instruction to life while encouraging students to actively engage with content and develop their knowledge and skills. (University at Buffalo, 2024)

Additionally, Verma (2019) stressed that teachers should strive to create an environment that is more conducive to engagement and learning. A classroom environment that is not positive and full of restrictions and rigid rules impairs learning by narrowing a student's focus and inhibiting his/her ability to explore multiple viewpoints and solve problems. A positive classroom environment helps improve attention, reduce anxiety, and support emotional and behavioral regulation of students. When educators foster a positive learning culture; learners are more likely to acquire higher motivation which leads to wonderful learning outcomes. Schools could potentially lift student achievement by improving their learning environments.

Similarly, planning ensured that lessons run on time, all the materials teachers need were on hand, and that students were guided on what they need to do. All this helped to free up moments throughout the day for teachers to stop and think. In this manner, teachers could assess how the lesson is going, how students were coping, and whether any tweaks need to be made. (User Friendly Resources, 2022)

Notably, Hawthorne (2022) discussed that teachers must create a physical environment that allows all pupils to feel content, comfortable, and focused. This means consideration of light, noise, air quality, temperature, reflections, and wall colors. For instance, there should be good natural light in classrooms, and quality electrical lighting. Ideally, there should be no glare from direct sunlight, blinds should be effective and the whiteboard projection should be easy to see. An organized and clutter-free space can help students to be more attentive and more engaged with their learning even during high heat conditions. Also, a positive learning environment allowed the child to develop a sense of belonging, trust others, and feel encouraged to tackle challenges, take risks, and ask questions. There are three main aspects to be considered in the creation of a positive learning environment; these are the physical environment, emotional environment, and respectful and supportive environment. A positive emotional environment, on the other hand, is a welcoming atmosphere that is devoid of stress. By ensuring a stress-free environment, the learner will feel safe and confident to share their opinions and thoughts. (The Global Scholars, 2021) In connection to this, Ismail's (2023) study affirmed that one of the most effective teaching methods is positive reinforcement. The results of his study had shown that positive reinforcement increases student engagement in the classroom.

Significantly, Blyznyuk & Kachak (2024) underscored that interactive learning often involves problem-solving activities, which foster students to apply critical thinking skills to analyze information, evaluate results, and solve educational problems. Through hands-on experiences and real-world scenarios, students develop the ability to think critically and make informed decisions. Such active engagement encourages students to process information deeper, leading to better understanding and retention of concepts. Interaction in the learning process frequently involves collaborative activities that encourage students to work together and share ideas. Notably, Oruikor et al., (2023) proved that classroom design is a critical element in creating an effective learning environment. Classroom design should be intentional and purposeful, incorporating elements such as natural light, flexible spaces, comfortable furniture, strategic use of color, and technology that supports learning.

Interestingly Friday (2023) shared that another way that community involvement can be promoted is by encouraging volunteerism. Volunteers played a crucial role in supporting schools, especially in low-income areas, where resources are limited. Volunteers could provide additional teaching support, mentorship, and after-school programs, leading to improved academic performance and better student outcomes.

Meaningfully, not only did student engagement make teaching itself more fun, engaging, and rewarding, but it has been shown to have critical impacts on students. When students displayed high levels of behavioral, emotional, and cognitive engagement, they are more likely to excel academically, form a stronger sense of connection with their school, and have a more positive sense of social-emotional well-being. (Sutton, 2021)

Remarkably, studies had shown that environment also improve pupils' concentration, cognitive performance, and productivity – in addition to reducing a range of respiratory symptoms. Schools with better-ventilated classrooms had even been shown to have higher test scores. (University of Leeds, 2022)

Remarkably, heat stress is an increasingly significant occupational hazard, especially in the context of climate change. With temperatures rising globally, workers in various industries face heightened risks to their health and productivity. Effective environment monitoring systems can play a crucial role in preventing heat-related illnesses, meeting OSHA compliance, and maintaining safe working conditions. (Room Alert, 2020)

Likewise, a positive nurturing environment is an indispensable part of learning. It is in a positive environment that a student feels comfortable; a place where healthy relationships with peers and teachers flourish. In a positive environment, the process of learning becomes something that students easily adapt to and look forward to. To achieve this environment, young students need to be nurtured with love, care, and support. (Verma, 2019)

Meanwhile, prioritizing teachers' mental health was essential for creating a healthy and productive learning environment. Teachers and school staff had an enormous impact on the lives of students—being sure they are taking proactive measures to support their mental health is an utmost priority for every community. (PAR, 2024)

Additionally, Spencer, 2018 quantified that classroom management is when a teacher exhibits complete control over their classroom through a series of strategies and techniques that encourage positive student behavior. The practice of effective classroom management turns the classroom into the optimum learning environment where students can engage with their studies and work to the best of their ability.

Significantly, Harrison (2024) emphasized that integrating real-world challenges into the curriculum compelled students to think critically and collaborate. Allowing students to work under unpleasant situations required them to explore multiple solutions and adjust their approaches as they encounter new information or face unexpected outcomes. In this aspect, teachers should encourage students to engage in projects that address real-world issues, whether through sustainability initiatives or community service. This real-world problem-solving strengthened their cognitive flexibility, equipping them to navigate ambiguity and adapt to evolving challenges, preparing them for the complexities of the modern workforce.

Likewise, technology helped change the student/teacher roles and relationships: students take responsibility for their learning outcomes, while teachers became guides and facilitators. Technology lends itself as a multidimensional tool that assists that process even during high heat conditions. (Edutopia, 2019)

Lastly, the power of collaboration lies in its ability to unite diverse stakeholders in a shared commitment to school safety. By working together, schools, law enforcement agencies, emergency responders, and mental health specialists can create a comprehensive safety net that protects students and staff from potential threats. Through information sharing, proactive risk mitigation, and integrated response coordination, collaborative partnerships pave the way for safer learning environments and brighter futures for all. (LinkedIn, 2024)

Significantly, Verma et al. (2024) pointed out that intensifying heat waves, exacerbated by the rise in carbon dioxide (CO) emissions, pose severe threats to global human health. Therefore, it becomes imperative to conduct analytical research on the control mechanisms that help mitigate the intensity of heat waves. The manuscript introduced a mathematical model to analyze the efficacy of mitigating heat wave intensity through optimal control of atmospheric CO by spraying water droplets. The model integrated key variables including human population density, atmospheric CO concentration, atmospheric temperature, and amount of water droplets. Using the suggested model, they examined how heat waves affect the human population. According to the study of the model, when the atmospheric concentration decreases due to the spraying of water droplets, heat wave intensity reduces, and human population density rises.

Consequently, Philstar Global (2023) detailed that as students struggle to deal with extreme heat in schools, the Department of Education on Tuesday issued reminders to parents and teachers to safeguard the well-being of learners. Teachers and students were raising concerns about the impacts of summer heat

on their health as well as the conduct of classroom learning. In a briefing, Health officer-in-charge Maria Rosario Vergeire urged parents and students to do the following:

Remind children to drink water often, make children wear light clothes so they are comfortable, do not go or play outside when sunlight is intense, and bring an umbrella.

Furthermore, Kutz (2024) explained that a longer-term solution is upgrading school infrastructure but the need for air conditioning is overwhelming. According to the Center for American Progress report, 36,000 schools nationwide don't have adequate HVAC systems. By 2025, it estimated that installing or upgrading HVAC or other cooling systems would cost around $4.4 billion. Some state or local governments were trying to address the heat issue. In June, the New York State Legislature passed a bill now awaiting the governor's signature that would require school staff to take measures like closing blinds or turning off lights when temperatures reach 82 degrees inside a classroom. Likewise, some teachers had been galvanized to take action, too. As president of the Patchogue-Medford Congress of Teachers, Toolan was part of an effort to secure $80 million for infrastructure upgrades through a bond vote. Over half will go to HVAC systems for some 500 classrooms in his district.

Remarkably, Bordey (2024) wrote that according to Division Memorandum No. 123, series of 2024, the office said, "Teachers and students can wear more comfortable clothing aside from their regular uniforms to reduce the heat they feel while inside the schools." With this, public school employees in the city were reminded to follow appropriate clothing in the workplace as stated under Civil Service Commission Memorandum Circular No. 19, Series of 2000 as violation of this rule would be grounds for disciplinary action. Principals of schools in Manila City were likewise reminded of their authority to suspend or shift to other learning modalities, based on their assessment of the situation in their areas.

Synthesis of the State-of-the-Art

The researcher' reviewed literature and studies provided the concrete foundation for the completion of this proposal. The present study bridged the gap between what is known and what should be explored in the main subject of this research. It is noteworthy that this phenomenological study centers on the lived experience of elementary teachers in Juban district in the province of Sorsogon during the occurrence of a high heat index and explores how the participants display resiliency in the delivery of instruction amidst the crisis.

The studies of Stoler & Park, Boholano & Jamon, and Obiar concentrated on the lived experiences of the respondents and participants on the occurrences that impacted the lives of the people. These studies elaborated on how the COVID-19 pandemic and the high heat index contributed to the decline in some aspects of education. These studies pinpointed the strengths and opportunities participants gained from the onslaught of these untoward phenomena.

Significantly, the effects of high heat index in various settings were revealed in the studies of Lala & Hagishima, Shortridge, De la Peña, and Neeth et al., These studies discovered that HHI caused absenteeism, physical symptoms of heat diseases, health and well-being issues. The ill effects of HHI were deliberately presented and discussed in these studies,

In addition to the cited literature and studies, Grandvaux, Chi, Reliefweb, and Dong et al. proved that participants encountered various challenges during the occurrence of HHI. It was identified that they met difficulty in dealing with the poor performance of learners during classroom encounters because of poor concentration and focus. Furthermore, hot classrooms impaired cognitive development and test scores declined.

Meanwhile, the factors that contributed to the resiliency of teachers were studied by Felisilda, Hascher & Mansfield, Antonio, and Boon. They found that there was a significant relationship between the participants' resilience and their well-being. In addition, teachers' resiliency was rooted in their care for students, positive learning environment, commitment to the sake of education, and support from the learning society.

Consequently, how teachers engaged their learners in classroom setups was discovered by Nidhi et al., Cariaso, and Rony and Alamgir. They stressed that teachers used coping strategies to motivate learners to continue to strive harder despite uneasiness and discomfort during the onslaught of HHI. Teachers displayed mindfulness and stress management techniques to help learners focus on learning tasks.

Finally, the researcher identified Verma et al., Philstar Global, Kurtz, and Bordey who conducted studies on measures conducted by teachers to mitigate the ill effects of HHI. They encouraged learners to drink enough water, wear light clothes, stay indoors, and follow protocols if suspension of classes were implemented.

Gap Bridged by the Study

Educational landscape and patterns continuously change since they try to fit and resolve current phenomena that challenge society and all its systems. The education sector incessantly finds ways to champion the welfare of the learners by delivering initiatives and schemes suited to the call of the times and the needs of the clientele.

During the COVID-19 pandemic, numerous research had been conducted to give way in understanding the impact of this crisis on the educational set-up around the world. Authors and researchers in the field of education prioritized discovering how schooling would continue to flourish despite the horror brought about by this unprecedented disaster. As a result, distant learning and all itNotably, Oruikor et al., (2023) proved that classroom design is a critical element in creating an effective learning environment. Classroom design should be intentional and purposeful, incorporating elements such as natural light, flexible spaces, comfortable furniture, strategic use of color, and technology that supports learning.

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s various forms became a normal endeavor globally.

In connection to the above-cited occurrence, high heat index became the new challenge that confronts the educational institutions in the country. Numerous complaints from learners, teachers, parents, and stakeholders were raised since this occurrence has impacts not only on health aspects but also on learners' academic achievements and progress. Unfortunately, many schools in the country were not built and constructed suited to the temperature and humidity in classrooms.

With the given reasons, the researcher is certainly convinced to materialize this proposal since the subject is timely and relevant and only a few numbers of this type of research have been conducted in the province of Sorsogon. Also, the researcher is assured that this phenomenological study is the first of its kind in the municipality of Juban based on the researchers' review of the literature and studies from library and online sources. This is the gap bridged by the study.

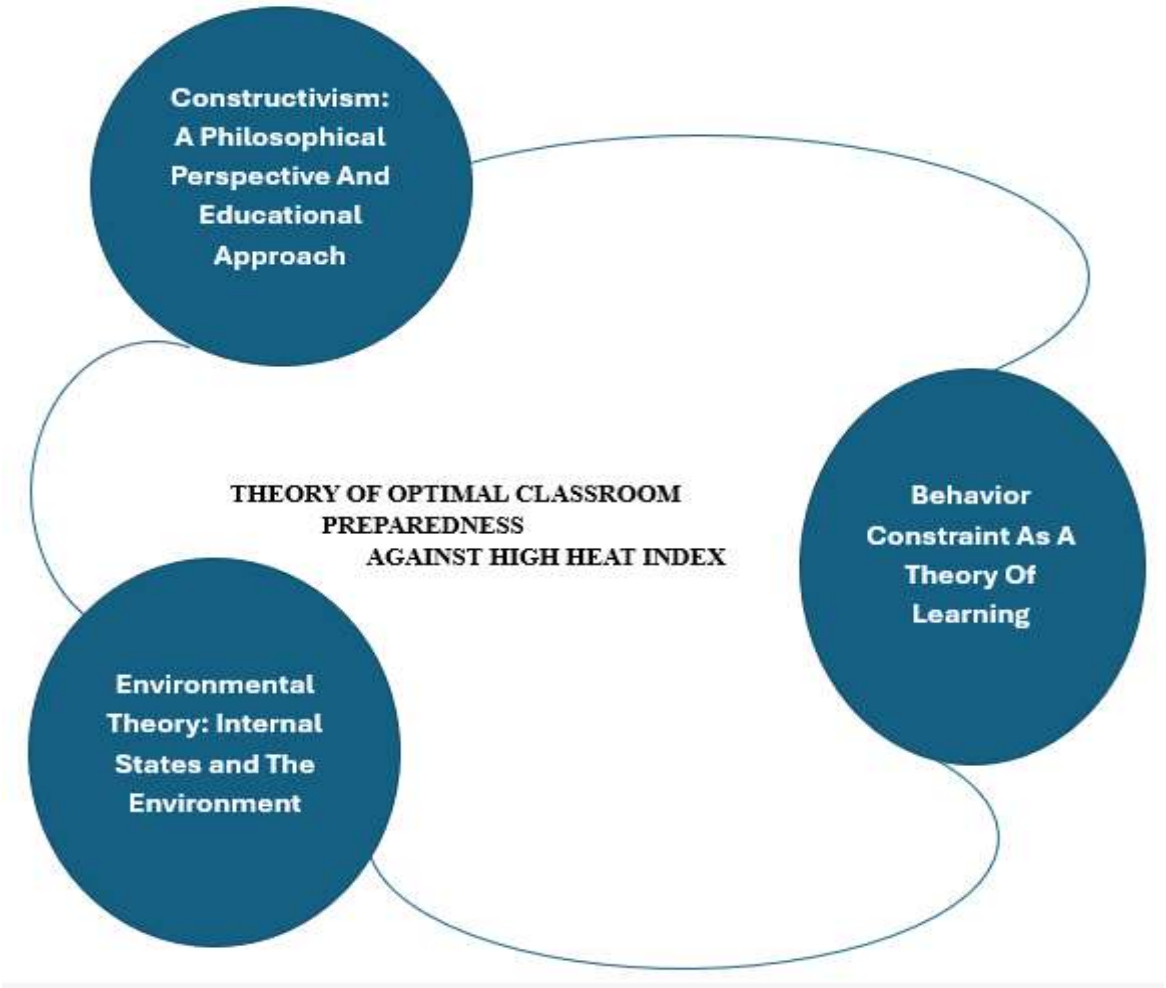

Figure 2

THEORETICAL PARADIGM

Theoretical Paradigm

Learning outcomes were the very basis for determining whether students obtain knowledge, skills, and values from academic encounters initiated and facilitated by classroom teachers. Failure to attain mastery of the most learning competencies would mean failure of all interconnecting variables that affect the process.

It is truthful to say that many factors contribute to the results of any learning opportunities confronted by students. These include their cognitive level, teachers and their instruction, students' attitude towards learning, school leaders' management techniques and most importantly, the environment, Significantly, the physical aspects of students' acquisition of knowledge have a bearing on their academic achievement and fulfillment. That is why, ensuring that classrooms, temporary learning shelters, and offices are safe and conducive for learning and working is of utmost importance.

This phenomenological study explored the lived experiences of elementary teachers in the municipality of Juban in the province of Sorsogon, and their resiliency in the delivery of instruction in times of high heat index. The impact of this unprecedented phenomenon on learners and teachers motivated the researcher to propose this paper and be of help to educational institutions experiencing similar dilemmas. Since the subject of this paper focused on the effects of a high heat index on learners' performance and teachers' resiliency, it is fitting to identify principles that support the scientific and theoretical framework of this proposal. Significantly, these philosophies included the idea of a safe and conducive environment for teaching and learning encounters. It posited that collaborative learning requires cooperation and coordination as universal and acceptable in all societies and educational paradigms. This was concerned with warranting that the physical setting of learners adds to their well-being and sound judgment.

Moreover, the researcher pointed out that educational institutions and their leaders should prioritize establishing a learning environment where students feel motivated to learn within the boundaries and expectations of a safe classroom. Learners, as the end goals of education, have rights to safe and favorable locations where meaningful and engaging academic activities take place. As proof, Lala and Hagashima (2023) revealed that during the heat wave conditions, 74% of teachers characterized the indoor environment within their classrooms as uncomfortably hot and very hot, revealing that 96% of these times, at least 3–10 students have left school early due to heat exhaustion, while complaining of being drowsy, lethargic, and experiencing fatigue. Children are found to be considerably more susceptible to heat than the average population,

In essence, high heat index's undesirable effects both for teachers and students opposed the belief of awareness and sensitivity to the environment and environmental challenges. This principle should be considered and emphasized to expect constructive responses and feedback from clientele. Indeed, well-structured and well-ventilated classrooms resulted in a more relaxed atmosphere and display a smooth flow of teaching and learning circumstances. According to Goodman et al. (2018), cumulative heat exposure inhibited cognitive skill development and implies that the physiological impacts of heat directly interfered with learning.

Another principle that highlighted the importance of classroom conditions which stressed that physical environments played in generating educational outcomes. Likewise, this was in connection with the call of concern for the environment and motivation to improve or maintain environmental quality. Positive learning outcomes were caused by desirable inputs to the process and the role played by the environment in acquiring knowledge, skills, and attitude is crucial. Boix-Vilella et al. (2021) study showed that indoor

temperature and indoor humidity significantly explain a worse perception of the mood of the teachers and a worse perception of students' behavior that influences perception of students' behavior.

In the same manner, the theoretical framework of this paper was anchored on the three theories of learning. Constructivism as a philosophical perspective and educational approach claimed that knowledge is constructed by the learner. It proposed that learners actively build and construct their understanding through various social interactions with their environment. A constructivist emphasized the role of experience in creating meaning and knowledge (Damyanov, 2023) Thus, experiences created in a conducive environment for learning denoted positive cognitive development and reaction.

Additionally, behavior constraint as a theory of learning viewed behavior could be explained by external factors and behavioral conditioning. The ideas of positive and negative reinforcement were effective tools for learning and behavior modification, as well as a punishment and reward system. Therefore, untoward behaviors manifested by learners during the upsurge of heat in the classroom may be due to external stimuli that trigger negative responses. Finally, the environmental theory proposed that internal states, the environment, and behavior all affect one another. Personality was determined by the interplay of behavior, environment, and cognitive processes---called reciprocal determinism. As a result, learning happened in an environment that was conducive and appropriate for profound meetings inside the classroom.

The interconnected of these theories enabled the researcher to formulate relevant and effective concepts that will serve as the solid foundation of this proposal. The researcher's theory which is, *Theory of Optimal Classroom Preparedness Against High Heat Index* highlights the importance of the conglomeration of the factors such as the cognitive and emotional attributes of concerned individual in the education setting as well as the contribution of other stakeholders in the resolution of conflicts brought about by HHI in classrooms. Effective steps to be undertaken by teachers, school leaders, community, and other public and private organizations would lead to a comfortable space for learners during classroom encounters. The availability of cooling devices such as electric and ceiling fans, together with air conditioners if possible are viable solutions that would encourage learners to go to school and participate in various learning activities. With the availability of the stakeholders and mechanical devices, problems related to HHI would be given resolution and would ensure safety among teachers and students.

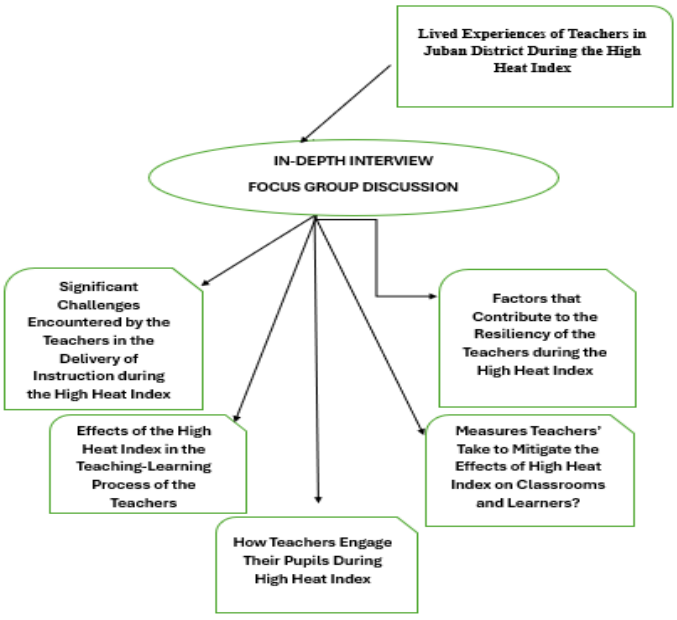

Figure 3

CONCEPTUAL FRAMEWORK

Conceptual Framework

This phenomenological study explored the lived experiences of teachers in Juban District during the onslaught of the high heat index. Likewise, this paper delved deeper into the effects of high heat index in the teaching-learning process and discover the significant challenges encountered by the teachers in the delivery of instruction during this unpleasant situation. Moreover, this research dentified some of the factors that contributed to the resiliency of the teachers and how they engage their pupils to be motivated to come to school regularly despite discomfort and uneasiness. Lastly, it also determined the measures done and implemented by teachers to mitigate the effects of high heat index on the learners and the classroom setting.

This qualitative study targetted the teaching-learning process, learning environments, teachers' management and leadership, and essential values displayed by Juban elementary teachers in situations that require patience and commitment.

The conceptual framework according to Hassan (2024) provided a clear understanding of the variables, relationships, and assumptions that reinforce a research study. It outlined the key concepts that the study is investigating and how they are related to each other. It also defined the scope of the study and set out the research questions or hypotheses.

The researcher comprehensively outlined all the key points and topics included in this present study. She determined the six main points in this study namely, the lived experiences of elementary teachers in Juban district during the high heat index, the effects of the phenomenon on the teaching-learning process of the teachers, significant challenges encountered during the delivery of instruction, factors that contribute to the resiliency of teachers in the delivery of instruction, how teachers manage pupils during the high heat index, and the measures conducted by the teachers to mitigate the effect of the situation.

In the framework, it was evident that in-depth interviews and focus group discussions would be utilized by the researcher to explore the lived experiences of the teacher-participants about the occurrence. To collect meaningful insights from the participants' narratives, the researcher should administer the said tools to appropriately discuss, interpret, and analyze qualitative data.

In essence, the harmonious and coherent flow of details or information sent by the participants led to valid and reliable results that were the basis for the findings, conclusions, and recommendations of this phenomenological research.

CHAPTER III

RESEARCH METHODOLOGY

This chapter presents a discussion of the methodologies used in this research. These procedures include the research design, population and sampling technique, instrumentality, ethical considerations, qualitative data analysis procedures, and explication of data, together with validity and reliability.

Research Focus

This qualitative research centered on exploring the lived experiences of elementary teachers in the Juban district during the occurrence of a high heat index. Furthermore, this phenomenological study provided answers on the effects of high heat index on the teaching-learning process of the teachers and the significant challenges they encounter during the delivery of instruction. Moreover, this study also discovered teachers' resiliency amidst the occurrence of high heat index in the classrooms and teachers'

styles in keeping pupils engaged in learning encounters. In the same manner, this study determined the measures conducted by the teachers to mitigate the effects of high heat index on classrooms and learners. Significantly, the researcher set up her study in the Juban district since she is a cluster head of the five schools in the area. This phenomenological study is timely and relevant because of the occurrence of a high heat index which started in April 2024. As an educational leader who always supervises and ensures the welfare of her constituents, she proposed this study to explore the lived experiences of the teachers regarding the adversity they encountered and to provide meaningful and effective resolutions in the field. The selection of twenty teacher participants was equally distributed among the five schools where they have been teaching for three years and above. The familiarity of the participants in a classroom setting and their experiences before the onslaught of high heat index were also considered by the researcher in choosing the participants.

In conclusion, this study revolved around the impact of a particular phenomenon on the teaching and learning process of teachers. This study provided concrete and first-hand information on how teachers act and showcase their determination and commitment to champion education despite the uneasiness and discomfort they have encountered.

Appropriateness of Design

This proposal is qualitative targeting to explain how an occurrence or phenomenon affects something. Qualitative research aims to uncover the meaning and significance of the phenomena, and it typically involves a more flexible and iterative approach to data collection and analysis compared to quantitative research (Hassan, 2024).

There were numerous research designs for qualitative research. However, this present study followed a phenomenological approach in treating data and understanding the process in the completion of this paper. This was the most appropriate research design since this approach was built on the assumption that the universal essence of anything ultimately depended on how its audience experiences it. This required an in-depth understanding of the participants' thoughts and perceptions of the phenomenon specifically the occurrence of high heat index and its effect on the elementary teachers of Juban district. Finding the lived experiences of the participants in this phenomenon in question relied on the interpretation and analysis of the researcher based on the narratives of the participants (Dovetail, 2024).

Significantly, this proposal made use of a phenomenological approach to gain meaningful insights into the experiences and feelings of the teacher-participants about the high heat index in classrooms. The narratives they shared allowed the researcher to conclude the phenomenon that may add to or even contradict what others may think or perceive about the scenario.

Research Questions

To gather sufficient data from the participants of this phenomenological study, the researcher crafted a set of questions that could be administered to the identified elementary teachers of the Juban district. Interestingly, effective and relevant open-ended questions would result in a comprehensive discussion of the sub-problems of this study through in-depth and structured interviews. Additionally, during the focus group discussion, the participants were given opportunities to elaborate on their experiences and concretize their narratives through the formal interview given earlier in the process. In this manner, triangulation ensured the significance and cohesiveness of narratives and responses.

Research Question 1: How do teachers perceive the impact of a high heat index on their instructional delivery?

Can you describe a specific instance when the high heat index affected your teaching?

How do you feel a high heat index influences your ability to deliver lessons effectively?
In what ways do you think the heat impacts student attention and participation?
How do you perceive the overall classroom environment changes during periods of extreme heat?
What are your thoughts on the long-term effects of high heat conditions on instructional quality?
Research Question 2: What strategies do teachers employ to manage the physical and emotional stresses associated with teaching in high heat index conditions?
How do you manage emotional stress when teaching in extreme heat?
Can you share any techniques you use to keep students comfortable and focused during hot days?
How do you balance maintaining instructional quality while dealing with heat-related stress?
How do you balance maintaining instructional quality while dealing with heat-related stress?
What advice would you give to new teachers about handling high-heat conditions?
Research Question 3: How do teachers adapt their instructional methods to maintain student engagement and learning outcomes during periods of extreme heat?
What changes do you make to your lesson plans on particularly hot days?
How do you modify classroom activities to keep students engaged despite the heat?
Can you describe any specific teaching methods that well in high-heat conditions?
How do you assess whether students are still learning effectively during extreme heat?
What feedback have you received from students about your adaptions to high heat?
Research Question 4: what role do support systems and community dynamics play in helping teachers cope with the challenges of a high heat index?
How does your school head support you during periods of high heat?
What role do your colleagues play in helping you manage the challenges of teaching in extreme heat?
How does the local community contribute to alleviating the impact of high heat on teaching?
Can you share any examples of support systems that have helped you cope with high heat?
What additional support do you think would be beneficial in managing high-heat conditions?
Research Question 5: How do teachers' experiences with high heat conditions influence their overall well-being and professional resilience?
How do you feel teaching in high heat conditions has it affected your physical health?
In what way has dealing with heat impacted your emotional well-being?
How do you think your experiences with high heat influenced your resilience as a teacher?
Can you describe any long-term effects of teaching in high heat on your professional life?
What coping mechanisms have you developed because of teaching in high-heat conditions?
Research Question 6: What mitigating measures can be employed by teachers during high index to continue meaning classroom instructions?
What practical steps do you take to mitigate the effects of high heat in your classroom?
How do you ensure that your students remain engaged in learning despite the heat?
Can you share any innovative solutions you've implemented to combat high heat in the classroom?
What role does technology play in helping you manage high conditions?
What recommendations would you make to other teachers facing similar high-heat challenges?

Population and Sampling Method

Population and sampling techniques are two important variables in any form of research since their absence would make the study incomplete and incomprehensible. Population refers is the entire group that researchers want to conclude and may refer to people, a group containing elements such as objects, events,

organizations, countries, species, organisms, etc. (Bhandari, 2023). On the other hand, the sampling technique pertains to the process of selecting a subset of data from a larger population or dataset to analyze or make inferences about the whole population gain insights or draw conclusions about the entire group (Hassan, 2024).

Remarkably, the participants of this present study were taken from the total population of elementary teachers in a clustered school in Juban district, province of Sorsogon. Five schools comprise this cluster and are supervised by a cluster head. In particular, twenty elementary teachers were determined by the researcher to participate in this phenomenological study. The selection was established using the convenience sampling technique, a non-probability sampling method where units are selected for inclusion in the sample because they are the easiest for the researcher to access (Nikolopoulou, 2023).

Concerning the above-cited population, the twenty participants were taken from the different grade levels starting from Kindergarten up to Grade VI, of which 2 teachers were handling Kindergarten classes and 3 teachers per Grade level in elementary. The researcher considers participants with three years of experience and above as classroom teachers to provide relevant and sufficient insights regarding the subject of this study.

Furthermore, the researcher carefully chose the twenty participants with different teaching positions from Teacher 1 to Master Teacher 2. This procedure enabled the researcher to collect rich insights and narratives from teachers who have dissimilar career stages such as those who were proficient and highly proficient. This method carved up the theories and foundation of the present study, resulting in credible and reliable outcomes or results.

Likewise, the researcher was certainly aware that the selected participants could offer first-hand data and details by willfully and truthfully sharing their lived experiences during the occurrence of high heat index in classrooms and the challenges they encountered over time. This phenomenological study explored how teachers' resiliency was fostered and evident throughout the delivery of instruction during this untoward situation.

Lastly, the number of participants per school could be viewed in the table below.

Name of School	**Position**	**No. of Cases**
Maalo Elementary School	Teacher 1	1
	Teacher II	1
	Teacher III	1
	Master Teacher I	1
Calmayon Elementary School	Teacher 1	1
	Teacher II	1
	Teacher III	1
Tampi Elementary School	Teacher 1	1
	Teacher II	1
	Teacher III	1
R.P. Tabuena Elementary School	Teacher 1	1
	Teacher II	1
	Teacher III	1
Sablayan Elemenetary School	Teacher 1	1

	Teacher II	1
	Teacher III	1
Catanagan Elementary School	Teacher 1	1
	Teacher II	1
	Teacher III	1
	Master Teacher I	1
TOTAL		**20**

TABLE A
The Participants

Informed Consent

Informed consent is a cornerstone of ethical research that involves human subjects. Moreover, it is one of the requisites and principles of research ethics which is the initial step in identifying participants and gathering data. This standard aims to protect the welfare and rights of the participants against any physical harm and destruction of their mental states and reputations. It is a must for the researcher to inform the participants about what is the research about and what would be their contributions in the realization of the study. According to Hassan (2024), informed consent is a process of communication between a researcher and his possible participants in which the researcher provides adequate information about the study, its risks and benefits, and the participant voluntarily agrees to participate.

This phenomenological study considered this aspect of ethics in research by conducting a procedure through oral consent wherein the researcher clearly and honestly informed the participants on what the subject of the study is, their part in the research, and what is expected of them by the researcher. Through oral consent, the researcher discussed the research requirements with participants verbally and obtained their consent. However, participants had the right to refuse and withdraw from participating in the research and they should not be coerced to meet the personal interests of the researcher. Participants were safe and secure during the conduct of the study and must value their time and convenience during gathering of data/ Since there were options offered, the researcher also sought written consent that would prove and coagulate the agreement between her and the participants. As the most utilized type of informed consent, written consent enabled participants to understand the subject of the study and its requirements. Furthermore, the document typically included information about the purpose of the study, procedures involved, risks and benefits, confidentiality, and participant rights. In this phase, participants were asked to sign the document as an indication of their willingness to participate.

Under the statements presented, informed consent also is associated with updating participants on any changes regarding research design and processes since they may affect some facets of participants' status and reputation. Additionally, the researcher established open communication with all the participants to address queries, concerns, and questions related to the study.

To sum up this portion, compliance with the principles of informed consent launched a harmonious relationship between the researcher and the participants. Respecting the rights and welfare of the participants of this phenomenological study fostered trust, loyalty, and cooperation among all individuals and entities involved herein.

Confidentiality

This qualitative research protected the rights and welfare of the twenty participants who were elementary

teachers in the Juban district. Since confidentiality and anonymity were of utmost consideration, their names and personal information were not mentioned in the paper. The researcher used codes to hide the identities of the participants since they deserved to be treated with care and anonymity for security reasons and purposes.

To support this claim**,** Kalpokas & Hecker (2024) pointed out that confidentiality and privacy in research were primary and crucial aspects of ethical considerations in any research since they involve information gathered from the lived experiences of the research participants. As a general rule, published research data should be anonymized to ensure that the distribution of sensitive data does not harm research subjects. Although this might sound challenging to keep things private and confidential, the researcher was committed to prioritizing this practice and safeguarding the participants.

In research, confidentiality covered the researcher's duty to avoid leakage of information or details from the participants. In other words, this meant that insights and results were protected thus, disclosure of data to unauthorized individuals is not permissible. On the other hand, privacy was related more to participants' control over the extent and manner of sharing personal information. In essence, privacy concerned a participant's right to decide when, how, and to what extent their personal information will be shared.

The ethical principle of confidentiality was built on the concept of trust. Participants trusted that the researcher would respect the sensitivity of the insights collected and that they were needed to be kept with privacy and confidentiality. This ethical standard was vital as it can impact a participant's disposition to share personal and often sensitive information, thereby affecting the quality and depth of research data. Sensitive data, in principle, was a broad concept, ranging from contact details to protected health information. Ultimately, any sort of recognizable information that could hint the research back to research participants could give away their identities and, thus, violate their trust.

Pilot Study

The researcher of this phenomenological study ensured the conduct of this research was made sure that all the components of its implementation were feasible. Likewise, a pragmatic pilot study was considered to explore the lived experiences of elementary teachers in Juban district during the occurrence of high heat index and their resiliency on the delivery of instruction. The advantage of the pilot study was manifested in whether something was achievable and possible to be conducted. It had a specific design feature and was conducted on a smaller scale for improvement in the quality and efficiency of the main study. In addition, it was conducted to evaluate the accuracy of the design and process, assess the reliability of the instrument, increase the researchers' experience with the study methods, and provide estimates for the appropriateness and relevance of the participants (Anesthesiol, 2017). Meanwhile, in this stage, feedback from participants and experts was crucial in crafting the instruments such as the set of questions for the in-depth interview and FGD.

Remarkably, conducting a pilot study allowed the researcher to improve and enhance the quality and effectiveness of this qualitative research. It established all the mechanisms of this present study and resolved issues that may arise in the preparation, gathering, and analysis of data. It guaranteed that the researcher's instruments are valid and reliable to collect honest and truthful insights from the participants.

Instrumentality

Instrumentality, according to Collins (2021) refers to any tool that is used by experts to obtain, measure, and analyze data. The data is sourced from subjects included in the research experiment and focused on the topic. Its function is to elicit data, information, and insights from the participants which are intended to be presented, interpreted, and analyzed.

Since this phenomenological study delved deeper into the lived experiences of elementary teachers in the Juban district during high heat index, the researcher primarily utilized in-depth interviews among the participants. This instrument generated narratives and responses that were relevant in providing answers to the problems raised in this study. In-depth interviews in qualitative research often have a central part in the process of understanding human behaviors and experiences. These dialogs were personal and systematic, geared towards exposing a person's experiences, viewpoints, and feelings. In the same manner, discovering the resiliency of the teacher-participants in the delivery of instruction would likely be exposed through one-on-one formal interviews.

Another substantial and suitable instrument used in this study is the focus-group discussion (FGD) which provided comprehensive responses from the participants on the subject of this study. Proper management of this action resulted in more comprehensive and concrete insights and details after raising the set of questions. This instrument permitted the researcher to raise follow-up questions based on the narratives they uttered during the in-depth interview. Concretizing the input of the teacher-participants resulted in rich and substantial discussion, interpretation, and analysis of data. In essence, the correctness and suitability of the instruments in the conduct of the study led to reliable and credible outcomes or data. This setup triggered the formulation of precise findings, conclusions, and recommendations of this proposal.

Explication of the Data

All the data collected among the twenty (20) teacher-participants served as basis to explore the lived experiences of elementary teachers in Juban district during the high heat index occurrence. In the same manner, insights from the interview and FGD were useful in discovering the effects of the phenomenon on the teaching and learning process, the challenges encountered, and the factors that affected the resiliency of elementary teachers. After the collection of data, they were organized, tabulated, and analyzed.

Correspondingly, qualitative data analysis is a process of gathering, structuring, and interpreting qualitative data to understand what it represents. It is non-numerical and unstructured and generally refers to text, such as open-ended responses to survey questions or user interviews (Dye, 2024). Remarkably, there were numerous ways for qualitative data analysis treatments to explicate the data from this present study.

Thematic analysis involves identifying and analyzing patterns or themes within the data. It involves coding the data into themes and subthemes and organizing them into a coherent narrative (Hassan, 2024). To interpret and analyze data in this study, theming was utilized by the researcher through the participants' narratives collected during in-depth interviews and FGD. These themes and subthemes were discussed by the researcher taking into account what the participants meant with their utterances. To validate the results and data, the researcher injected related literature and studies that supported or negated the findings.

Another qualitative data analysis treatment was narrative analysis. This involved analyzing the stories and narratives presented in the data. It involved examining how the stories were constructed and how they contributed to the overall understanding of the phenomenon being studied. Since the participants shared meaningful insights with the researcher, the latter included the meaning of those utterances to avoid confusion and misleading statements. In this manner, participants' narratives were interpreted appropriately and openly.

The utilization of these qualitative analysis treatments allowed researcher to explore the lived experiences of teachers during the occurrence of high heat index and use these insights to guide other researchers on

the conduct of their studies relevant to the findings, conclusions, and recommendations of this present study.

Validity

Validity in qualitative research refers to the suitability of the tools, processes, and data. Whether the research question is valid for the desired outcome, whether the selection of procedure is fitting to answer the research problems, whether the design is effective for the methodology, whether the sampling and data analysis are appropriate, and finally the results and conclusions are valid for the sample and context. In evaluating the validity of qualitative research, the choice of methodology must enable the uncovering of findings/phenomena in the appropriate context for it to be valid, with due regard to cultural and contextual variables. For sampling, procedures, and methods must be appropriate for the research paradigm theoretical framework and sampling technique (Leung, 2015).

For data extraction and analysis, several methods were adopted to enhance validity. The first stage was the analysis of researchers based on the data collected from the participants, followed by looking into the resources and theories, and the last was verifying all materials and resources needed in the conduct of the study.

In conclusion, internal and external validity were significant in the conduct of this phenomenological study. Internal validity lied in the establishment of the causal relationship of all the variables in this study. For instance, the research design which was the phenomenological study answered all the queries or sub-problems involved herein. On the contrary, external validity was useful in providing generalizations formulated by other individuals who are not part of this study. As proof, during the pilot study, the researcher asked for assistance from external stakeholders to validate the instruments, the process, and the procedure in the conduct of this qualitative study.

By addressing issues regarding the validity of this phenomenological study, the researcher expected accurate findings on exploring the lived experiences of elementary teachers in the Juban district along with the occurrence of high heat index and used these data as a reference for future studies and discussions.

Reliability

In quantitative research, reliability refers to the exact replicability of the processes and the results. In qualitative research with diverse patterns, such a definition of reliability is challenging. Hence, the essence of reliability for qualitative research lies in consistency (Leung, 2015). Reliability in qualitative research refers to a difficult method using standardized tests such as the set of questions crafted by the researcher intended for in-depth interviews and focus group discussion. In line with this, results and data obtained from the administration of these instruments must be consistent, coherent, and accurate as to the exploration of the lived experiences of elementary teachers in Juban district on the occurrence of high heat index in classrooms.

The consistency of data in this phenomenological study was significant to avoid errors and discrepancies in the data collected. Alongside this, the researcher was reminded that the research process and methods must be clearly defined and followed through the conduct of this study. In this manner, reliability was emphasized and evident in the entire duration of this study.

To check and control the flow of implementation, the researcher kept documentation effective and comprehensive. Documenting all the aspects and variables of this study established the reliability of this qualitative research. Also, transparency was achieved since detailed records were kept by the researcher. Remarkably, the scope and analysis of data included was comprehensive and inclusive concerning

quantitative aspects as possible. Taking records comprehensively and correctly led to reliable results or findings of this phenomenological study.

CHAPTER IV
PRESENTATION, ANALYSIS, AND INTERPRETATION OF DATA

This chapter presents all the data collected from the participants of this phenomenological study. After careful procedure was undertaken by the researcher, the data were sorted out, analyzed, and interpreted using appropriate and effective qualitative tools and processes to provide comprehensive answers to the problems raised in this research.

In this chapter, the researcher categorized the various themes that emerged from participants' responses. These themes aided the researcher in embracing pertinent and useful understandings regarding teachers' perceptions and experiences regarding HHI and its impact primarily on the learners' acquisition of knowledge and teachers' delivery of instruction. In the same manner, the pages in this chapter are sorted accordingly based on six concepts mainly, the impact of a high heat index on the delivery of instruction, strategies employed by teachers to manage the physical and emotional stresses associated with teaching HHI, ways on how teachers adapt their instructional methods to maintain student engagement and learning outcomes during periods of extreme heat, role played by support systems and community dynamics in helping teachers cope with the challenges of HHI, influence of teachers' experiences with high heat conditions on their overall well-being and professional resilience and the mitigating measures employed by teachers during HHI to continue meeting classroom instructions. Moreover, this chapter enabled the researcher to construct accurate and truthful findings, conclusions, and recommendations which were considered salient facets of this recent study.

1. The Impact of High Heat Index on Instructional Delivery

The effects of a high heat index on instructional delivery in educational settings were profound and multifaceted. As temperatures soar, both students and teachers experienced a range of challenges that directly influence their capacity to engage and perform. A recent study highlighted the sentiments of various participants regarding how extreme heat alters the learning environment. Through their narratives, three central themes emerged: student concentration and comfort, teacher well-being and instructional delivery, and alternative teaching methods.

Student Concentration and Comfort

A recurring concern among participants was the detrimental impact of high heat on students' concentration and overall comfort during lessons. Participant 1 remarked that classes are sometimes suspended due to excessively high temperatures, noting that learners struggle to concentrate and often feel uncomfortable. He mentioned, *"There are times that the classes are suspended due to high index. During the face-to-face classes, the learner cannot concentrate and they are uncomfortable".* This sentiment was echoed by Participant 3, who emphasized that when the heat index rises, students cannot focus on the lesson. As proof, he declared, *"When the heat index strikes the pupils cannot focus on the lesson".*

The issue of lethargy and irritability was highlighted by Participant 4 during a summer session, where both students and teachers found it difficult to remain attentive. He professed that *"One specific instance when the high heat index affected my teaching was during a summer school session. The high heat index made it difficult for both the students and me to concentrate and we often found ourselves feeling lethargic and irritable. And we all know that the uncomfortable conditions were taking a toll on their ability to learn".* Additionally, Participant 5 elaborated that high temperatures render students less attentive and teachers

more fatigued, reinforcing the idea that the heat index directly influences engagement and learning outcomes. He uttered, "*Students become less attentive and focused and teachers like me feel fatigued and less energetic".*

The discomfort felt by students is not merely a minor inconvenience; it manifests in lower academic performance and poor interaction during discussions. Participant 11 observed that pupils were inattentive and exhibited low performance while Participant 10 pointed out that extreme heat hampers students' motivation and academic prowess. The latter stared that *"Extreme heat can affect the academic performance of pupils. They lose their focus and concentration during the learning process. It is also very difficult to motivate learners. Some of the pupils are less interested in the lessons"*. Moreover, the first said *"Pupils are inattentive, poor interaction during discussion and low performance"*. With the heat becoming a significant distraction, Participant 19 noted that students often find their attention diverted by the oppressive temperatures in the classroom. He added *"During high heat index pupils cannot concentrate. They are distracted when the high temperature inside the classroom is occupied*". Overall, the narratives surrounding student concentration illuminate the pressing need for effective strategies to combat the adverse effects of high heat in educational environments.

Meanwhile, the study of Cho (2017) analyzed the effect of summer heat on academic achievement. Summer heat can negatively affect student learning, as previous studies have shown that high temperatures in laboratory settings harm cognitive abilities. Moreover, summer heat negatively affected student test scores. Specifically, an additional day with a maximum daily temperature exceeding 34 °C (93.2 °F) during the summer, relative to a day with a maximum temperature between 28 °C (82.4 °F) and 30 °C (86 °F), decreased the scores of math and English tests by 0.0042 and 0.0064 standard deviations, respectively.

Teacher Well-being and Instructional Delivery

The experiences of teachers under high heat conditions also revealed a concerning trend regarding their well-being and effectiveness in delivering instruction. Participant 2 highlighted that teachers prioritize their students' safety and comfort, which can compromise their ability to keep students focused. He reported that *" As a classroom teacher, students' safety and well-being were prioritized. It was so hard to keep students focused, that's 'why we need to plan instructional delivery and to develop alternative plans, ensuring minimal disruption to learning"*. The fatigue and diminished energy levels felt by teachers were mentioned by Participant 5, emphasizing how extreme temperatures can sap their vitality and hinder instructional delivery. He voiced out *"Students become less attentive and focused and teachers like me feel fatigued and less energetic".*

Health concerns arise as well; Participant 7 warned that high heat can lead to serious health issues such as heat stroke and elevated blood pressure, affecting both teachers and students. He exclaimed, *"High heat index can cause heat stroke and can elevate blood pressure. It is very uncomfortable for the teacher and also to the learners*.". Additionally, Participant 9 recounted a personal experience of dizziness due to the heat, which impeded lesson execution. He admitted, *"There was a time that I was teaching in the afternoon when I felt dizzy due to the very environment. That was the time that my lesson plan for that was not carried out"*. Other participants like Participants 13 and 15 noted that heat exacerbates pre-existing health conditions, such as asthma, leading to further disruptions in-class activities. *"The high heat index impacted not only the teaching but also the learning process. Students struggled to concentrate and reduced focus due to severe heat. I experienced asthma and had to take breaks caused by extreme heath". "High heat can trigger my asthma. It is very difficult for me to teach and even perform simple tasks if there is an extreme heat",* they emphasized respectively. Moreover, inadequate ventilation and overcrowded

classrooms contribute to the discomfort and fatigue experienced by educators, as described by Participant 18, who emphasized how these factors compound the challenges faced during instruction. He specified *"High heat index affect my teaching, simply because during that time my classroom does not have enough electric fan and not well ventilated due to division of classroom, it adds more heat because of limited space to more freely inside the classroom'.*

Accordingly, Hernando-Malipot (2024) reported that teacher Nur of Cotabato City emphasized the importance of protecting the health of both students and staff during this hot season. She recommended water breaks in each lesson to keep children hydrated, ensuring well-ventilated rooms, avoiding afternoon classes, and scheduling modular lessons whenever possible, especially during peak heatwaves.

Alternative Teaching Methods

In response to the challenges posed by high heat, educators have sought alternative teaching methods to mitigate disruptions in learning. Participant 12 shared that face-to-face classes are often suspended, leading to the use of alternative approaches such as sending or printing modules and worksheets. He cried *"Due to the high heat index our school suspended face-to-face classes and shifted to an alternative method. We send/print modules or worksheets to the pupils, so basically the disruptions of what maybe done during face-to-face classes, so the learning was affected".* While these measures provide some continuity, they also introduced new challenges to the learning process, as noted by Participant 20, who acknowledged that both physical and cognitive aspects of teaching and learning are affected. He honestly acknowledged that *"A high heat index can have several negative impacts on the teaching-learning process. Their effects can be both physical and cognitive, affecting both teachers and students".*

The transition to alternative instructional methods, while necessary, underscores the complexity of adapting to environmental challenges. Participants' narratives reflect a broader need for educational systems to innovate and find effective ways to maintain engagement and learning, even under adverse conditions.

Significantly, the three themes discussed above conform with the report of Will (2022) exposing that cumulative heat exposure decreases the productivity of instructional time—without school air conditioning, the year's learning decreases by one percent for every one percent increase in hotness. In addition, she reported that exams for 3rd to 8th graders found that the impact of heat on mathematics achievement is about three times larger than its impact on achievement in English/language arts. These data suggest that HHI has a massive effect on the performance of the learners inside the classroom.

Teacher Well-Being and Instructional Delivery: Navigating the Challenges of High Heat Index

The teaching profession often involves navigating a myriad of challenges, from curriculum demands to student engagement. However, environmental factors such as extreme heat can exacerbate these challenges, significantly impacting teacher well-being and instructional delivery.

The Impact of Heat on Teacher Focus and Well-Being

Teachers consistently prioritize the safety and well-being of their students. However, this commitment can come at a personal cost, especially during oppressive heat conditions. Participant 2 highlighted this dilemma, noting that the concern for students' safety can distract them from maintaining their focus, making it essential for teachers to develop alternative instructional plans to minimize learning disruptions. He detailed *"As a classroom teacher, students' safety and well-being were prioritized. It was so hard to keep students focused, that's 'why we need to plan instructional delivery and to develop alternative plans, ensuring minimal disruption to learning".*

The high heat index can severely affect a teacher's ability to concentrate. As reported by Participant 4, the extreme heat during a summer school session led to difficulties in maintaining focus, resulting in feelings of lethargy and irritability. He cited *"One specific instance when the high heat index affected my teaching was during a summer school session. The high heat index made it difficult for both the students and me to concentrate and we often found ourselves feeling lethargic and irritable. And we all know that the uncomfortable conditions were taking a toll on their ability to learn".* These sentiments were echoed by Participant 5, who noted that fatigue and a lack of energy were prevalent among teachers due to the high temperatures. He quoted *"Students become less attentive and focused and teachers like me feel fatigued and less energetic".*

The consequences of high heat are not just limited to discomfort; they pose serious health risks. Participant 7 discussed how elevated temperatures can lead to conditions such as heat stroke and elevated blood pressure, affecting both teachers and students. Such health risks make it crucial for educators to find ways to adapt their instructional strategies during extreme weather. He confessed that a *"High heat index can cause heat stroke and can elevate blood pressure. It is very uncomfortable for the teacher and also to the learners".*

Likewise, Participant 9 described an incident where dizziness from the heat prevented the execution of a planned lesson, illustrating the direct impact of environmental factors on teaching efficacy. He narrated *"There was a time that I was teaching in the afternoon, when I felt dizzy due to the very environment. That was the time that my lesson plan for that was not carried ou*t." Similarly, Participant 13 shared their struggle with asthma, exacerbated by the heat, which required frequent breaks and further disrupted the teaching process. He pleaded *"High heat index impacted not only the teaching but also the learning process. Students struggled to concentrate and reduced focus due to severe heat. I experienced asthma and had to take breaks caused by extreme heat*". The effects of heat were not merely anecdotal; Participant 15 also noted that high temperatures can trigger asthma symptoms, complicating their ability to perform even simple tasks, and recounted that *"High heat can trigger my asthma. It is very difficult for me to teach and even perform simple tasks if there is an extreme heat."*

Furthermore, Participant 18 pointed out that inadequate ventilation and limited classroom space can compound the heat problem, creating an uncomfortable environment that hinders effective teaching and learning. He described *"High heat index affect my teaching, simply because during that time my classroom does not have enough electric fan and not well ventilated due to division of classroom, it adds more heat because of limited space to more freely inside the classroom".*

Concerning the above result, Boix et al (2021) investigated how temperature, inside and outside the classroom, influences teachers' mood and mental fatigue as well as the perceived students' behavior. Mood, mental fatigue, and perception of students' behavior were evaluated by the teachers. Results showed that indoor temperature, indoor humidity, and the difference between outdoor/indoor temperature significantly explained a worse perception of the mood of the teachers and a worse perception of students' behavior that influenced the perception of students' behavior.

Alternative Teaching Methods in Response to Environmental Challenges

In response to the challenges posed by high temperatures, educators have had to pivot to alternative teaching methods. Participant 12 described the suspension of face-to-face classes due to the high heat index, leading to the adoption of strategies such as distributing printed modules or worksheets. While this approach can mitigate some immediate discomfort, it also poses challenges in maintaining the quality of learning. He elaborated *"Due to the high heat index our school suspends face-to-face classes and shifts to*

an alternative method. We send/print modules or worksheets to the pupils, so basically the disruptions of what maybe done during face-to-face classes, so the learning was affected".

Accordingly, the physical and cognitive impacts of high temperatures resonate with Participant 20, who highlighted that both teachers and students are affected during this time. The need for alternative methods of instruction is evident, yet the effectiveness of such measures remains a concern. He pointed out that *"A high heat index can have several negative impacts on the teaching-learning process. Their effects can be both physical and cognitive, affecting both teachers and students"*. These adaptations, while necessary, may not always be sufficient to replicate the interactive and engaging environment that traditional classroom settings offer.

Moreover, Preña and Labayo (2024) identified policy measures implemented by government agencies to mitigate the adverse effects on students and teachers, including face-to-face class suspensions, shifts to alternative instructional methods, adjusted class schedules, and discussions on returning to the traditional school calendar. The establishment of heat response plans for educational institutions and the development of improved location-specific heat indices are essential to adapt to this new climate reality and minimize the disruption of educational activities.

The Impact of High Heat Index on Teaching Effectiveness: Insights from Educators

As climate change continues to bring extreme weather conditions, educators face significant challenges in delivering lessons effectively, particularly during periods of high heat index. A recent qualitative study captured the experiences of several teachers, revealing how elevated temperatures affect their teaching and their students' learning. The responses were categorized into three primary themes: Physical Discomfort and Health Issues, Impact on Student Engagement and Learning, and Strategies to Mitigate Heat Impact.

Physical Discomfort and Health Issues

Numerous educators highlighted the detrimental physical effects of high heat on their ability to teach. Participant 1 articulated a common sentiment: *"High heat index makes me uncomfortable and irritated, affecting my focus on the lesson."* This discomfort is not merely a nuisance; it actively detracts from the quality of instruction. Participant 4 noted that *"Physical discomfort from excessive heat and humidity is distracting, leading to a decrease in the quality of instruction."*

Participants also reported a significant decline in concentration and energy levels, with Participant 5 stating that *"High heat index leads to decreased concentration and energy levels, making it challenging to deliver lessons effectively."* The discomfort experienced by teachers can sometimes lead to anxiety, as expressed by P12: *"High heat index causes anxiety and stress for both teachers and pupils, leading to trouble concentrating."*

Extreme temperatures contributed to heat exhaustion, which was emphasized by Participant 13: *"Extreme heat causes heat exhaustion, leading to an unproductive teaching-learning process."* The ripple effects extended to the students as well; Participant 15 commented, *"High heat makes pupils sluggish and uncomfortable, and teachers are also affected, making instruction delivery difficult."*

Interestingly, the impact of HHI on the teachers which was elaborated in the themes above is affirmed by Valerio (2024) who emphasized that this discomfort led to heat-related illnesses such as heat exhaustion and dehydration. Also, she pointed out that teachers may struggle to concentrate and perform their duties inside the classroom.

Impact on Student Engagement and Learning

The implications of high heat extend beyond teachers' personal experiences; they significantly impact

student engagement and overall learning outcomes. Participant 3 noted, *"High heat index affects lesson effectiveness and lowers pupil participation."* This frustration is echoed by Participant 9, who expressed disappointment when students struggle to concentrate, leading to poor performance: *"Disappointment and frustration arise when pupils cannot concentrate and perform poorly due to extreme heat."*

Furthermore, Participant 10 elaborated, stating that *"High heat index affects lesson delivery as pupils lose focus and concentration, making it difficult to meet goals and objectives."* As teachers grapple with their discomfort, it becomes increasingly challenging to maintain an effective teaching environment. Participant 11 highlighted this struggle: "Difficulty focusing on teaching when pupils are uneasy." The feedback from Participant 14 confirmed this trend: *"Pupils are inattentive due to high temperature,"* ultimately leading to an ineffective teaching-learning process as described by Participant 17.

Similarly, a survey in March 2024 among teachers in Manila found that intense heat in classrooms affects students' ability to concentrate. This underscored how immediate temperatures in Philippine classrooms during the summer months have become detrimental to student learning. (Preña &Labayo, 2024)

Strategies to Mitigate Heat Impact

Despite the overwhelming challenges posed by high heat, educators are finding ways to adapt their teaching methods to mitigate the impact. Participant 2 recommended employing engaging and interactive strategies: *"To deliver lessons effectively in high heat, use engaging and interactive methods, multimedia resources, provide regular breaks, encourage water intake, and prioritize pupils' well-being and safety."*

Furthermore, Participant 18 advised minimizing physical activity in the classroom: *"Minimize movement and reduce activities like board work and group activities to avoid unnecessary incidents."*. These strategies not only help in maintaining some level of engagement among students but also promote a more manageable classroom environment for teachers.

Likewise, incorporating interactive and engaging teaching methods can help mitigate the effects of high heat index levels on student motivation and participation. Utilizing multimedia presentations, group activities, and hands-on learning experiences can provide a welcome diversion from the heat and keep students actively engaged in the discussion process. Additionally, integrating movement breaks and incorporating outdoor learning opportunities can offer a refreshing change of scenery and help students stay energized and focused (Ortiz, 2024).

The Impact of Heat on Student Attention and Participation

As temperatures rise, educators and students alike feel the effects of heat on learning environments. Recent discussions with students reveal alarming trends regarding how high heat impacts their attention and participation in class. These narratives have been classified into three main themes: distraction and reduced focus, physical and cognitive impairment, and strategies to mitigate heat impact.

Distraction and Reduced Focus

A significant number of students reported that high temperatures make it challenging to focus on lessons. For instance, Participant 1 expressed that *"pupils are distracted and can't focus on the lesson, making it hard to understand the discussion and reducing participation."* Similarly, Participant 3 noted, *"High heat decreases pupils' focus and sometimes leads to absenteeism," indicating that the discomfort can lead to skipping school entirely."*

Physical discomfort associated with heat was a recurrent theme. Participant 4 stated, *"Physical discomfort from heat makes it difficult for students to sit still and focus,"* while Participant 5 mentioned that *"students feel tired and uncomfortable in hot weather,"* requiring more frequent breaks to hydrate. This sentiment

was echoed by Participant 6, who observed that *"heat brings discomfort, distracting students from listening to the teacher and making them more irritable."*

Several participants, including Participant 8 and Participant 10, discussed the detrimental effects of heat on attention spans, noting that hot temperatures *"affect pupils' attention and participation during class discussions."* Participant 11 highlighted that *"pupils become restless, making it hard to find motivation for them to listen attentively and participate."* This loss of focus not only hinders classroom engagement but can also diminish overall learning outcomes.

In essence, Pinuga (2024) supported this result confirming that the adverse effects of a hot classroom extended beyond academic development. Heat affects students' social and emotional well-being, making it harder to concentrate, increasing impulsiveness, and even raising the likelihood of aggression. It also presented serious health risks, potentially worsening existing health issues such as asthma or heart conditions. This led to increased absenteeism, further compromising student progress.

Physical and Cognitive Impairment

Beyond mere distraction, the cognitive implications of high temperatures were starkly illustrated by Participant 2 who remarked, "*High temperatures cause distraction, fatigue, cognitive impairment, irritability, and daydreaming."* Participant 12 noted that heat affects *"pupils' attention, motivation, energy, and mood," indicating a broader impact on students' overall engagement in school."*

Participant 14 added that heat leads to *"slower performance and decreased participation,"* emphasizing that the cognitive load is significantly affected when temperatures rise. This impairment in cognitive function was further highlighted by Participant 20, who stated that high temperatures *"make it difficult for students to focus and retain information."* These insights suggest a pressing need for intervention strategies to address the cognitive decline associated with excessive heat.

The above result is interrelated with the study of Rony & Alamgir (2023) who stressed that heat-induced stress can impair cognitive function, affecting memory, attention, and decision-making abilities. Prolonged exposure to high temperatures can trigger a stress response in the body, leading to the release of stress hormones such as cortisol. Elevated cortisol levels can impair cognitive processes, including memory formation, attention span, and complex problem-solving. Heat-induced cognitive impairments can hinder daily tasks, exacerbate stress, and contribute to a sense of mental strain and frustration.

Strategies to Mitigate Heat Impact

Recognizing the challenges posed by high temperatures, some participants offered suggestions on how teachers can create a more conducive learning environment. Participant 2 proposed that *"teachers can use engaging and interactive lessons, multimedia resources, provide regular breaks, encourage water intake, and prioritize pupils' well-being and safety."* These strategies could help alleviate the adverse effects of heat, making learning more effective.

By fostering an interactive classroom atmosphere, encouraging hydration, and scheduling breaks, educators can combat the negative influences of high temperatures. These proactive measures not only promote physical comfort but can also enhance cognitive functioning, leading to improved attention and participation. The strategies presented by the participants are in line with the tips presented by Davies (2024) stating that when the heat index rises staying inside to work on crafts, reading, or playing board games makes the most sense. She also pointed out to plan ahead if there will be several days of high heat in a row, think of creative ways to have kids switch up their activities and avoid restless and irritable feelings, and help them stay active,

The Classroom Environment in Extreme Heat: Challenges and Solutions

As climate change intensifies and heatwaves become more frequent, educators face unique challenges in creating a conducive learning environment. Feedback from a range of participants sheds light on how extreme heat affects classrooms and suggests strategies to counteract these effects. Responses have been classified into three main themes: physical discomfort and non-conducive learning environments, impacts on student behavior and engagement, and suggested mitigation strategies.

Physical Discomfort and Non-Conducive Learning Environment

One of the most immediate effects of extreme heat is the physical discomfort experienced by both students and teachers. Participant 1 highlighted that "*Even with enough space, the classroom becomes non-conducive,"* indicating that physical space alone cannot remedy the discomfort. This discomfort often leads to a decline in focus and energy. For instance, Participant 4 described the atmosphere as *"uncomfortable and oppressive,"* resulting in *"restlessness and difficulty concentrating."* Similarly, Participant 5 noted that extreme heat leads to *"decreased student focus and energy,"* necessitating frequent breaks for hydration.

Many participants echoed the sentiment that the classroom environment becomes wholly unfit for learning. Participant 6 admitted that *"Learning gaps are noticeable in those times since classes are usually canceled or suspended."* Participant 7 owned-up *"performance level become low"* and Participant 14 echoed *"learners and teachers physically were uncomfortable that may lead to poor concentration and mental sharpness."* Participant 10 emphasized the adverse effects of heat stress, especially during physical activities: "*Teaching in high heat conditions has long-term effects on instructional quality leading to absenteeism of learners and lower concentration.* while Participant 13 mentioned how extreme heat can disrupt the mood of both teachers and learners: *"shortening class periods of shifting to earlier morning hours affects the regular flow of academic year and curriculum delivery."* This disruption is further compounded by increased noise levels and distractions as Participant 16 stressed out and an overall drop in participation and absenteeism as coded by Participant 18.

Significantly, extreme weather conditions, such as heat waves will adversely impair students' development, well-being, and learning outcomes. In India, a study conducted by Lala and Hagishima (2023) gathered data from the field survey to understand classroom experiences and challenges encountered by children and teachers during heat waves. It underscores several aspects of students' vulnerability to heat exposure and its adverse impact on their health, such as absence from school, physical symptoms of heat distress, etc. Furthermore, it highlighted the pressing need for classroom heat risk management in light of climate change and makes several policy prescriptions in primary schools.

Impact on Student Behavior and Engagement

The ramifications of extreme heat extend beyond physical discomfort, severely impacting student behavior and engagement. Participant 3 illustrated how physical discomfort can lead to decreased participation in discussions, while Participant 4 noted that students become *"more fidgety and less focused,"* with concentration dropping significantly. Participant 9 added that students' performance declines, particularly during formative assessments: *"I perceive it by simply looking at how my pupils behave during the lesson. Their performance becomes worse, especially during discussion and formative tests."*

The heat can create an atmosphere where learning is compromised. Participant 11 mentioned that "*everything becomes disorganized,"* effectively halting learning progress. Participants also discussed how heat affects the emotional and social well-being of students. Participant 12 described a "*negative aura"* in the classroom, resulting in impulsiveness and aggression. Participant 19 confirmed that "*students'*

emotional well-being is adversely affected," highlighting the broader implications of heat on mental health.

Matson (2021) disclosed that in a 2014' study both excessively cold and hot temperatures directly affect students' learning ability. High school students scored an average of 76 percent when it was 61°F, and did worse when it was 81°F, scoring an average of 72 percent. When it was 72°F, which many consider a comfortable temperature, students' average scores went up to 90 percent. The researchers noted that when the body is subjected to thermal discomfort, a person's brain will be distracted by signals from the body. When students are in an environment that is hot or cold, maintaining homeostasis becomes the mind and body's priority, making it harder to concentrate on schoolwork.

Suggested Mitigation Strategies

Despite the challenges posed by extreme heat, participants have offered practical solutions to create a more conducive learning environment. Participant 2 suggested several strategies, including the installation of fans, window treatments for shading, hydration stations, flexible scheduling, and heat-aware policies. She uttered *"During of period of extreme heat, the classroom environment undergoes significant changes that impact teaching, learning, and overall comfort. The classroom environment must have fans, shading or window treatments like curtains, hydration stations, flexible scheduling of pupils, and heat aware policies."* These interventions aim to enhance comfort and foster a better learning atmosphere.

Remarkably, the Cen et al. (2024) study conformed with the above result asserting that fan-assisted cooling strategies are widely employed in tropical climates due to their energy-saving benefits while ensuring thermal comfort through increased air temperature and air velocity. Their study observed a significant impact of classroom thermal conditions on students' cognitive performance. It was found in both schools that students' cognitive performance scores decreased significantly with increased temperature and decreased air velocity. Additionally, students' cognitive performance decreased by 9.2 % and 18.1 % in slightly warm and warm sensations, respectively, compared to the neutral sensation. These findings underscored the significance of air velocity as a crucial factor in the design of classroom environments, particularly in tropical climates, to enhance students' thermal comfort and optimized their cognitive performance.

The Long-Term Effects of High Heat Conditions on Instructional Quality

As global temperatures continue to rise, educational institutions are increasingly confronted with the challenge of high heat conditions. These extreme temperatures have profound effects on both instructional quality and the well-being of teachers and students. In an analysis of various responses from educators, three key themes emerged: compromised learning environments, teacher and student well-being, and strategies for adaptation. This article delved into each theme, supported by participant narratives that illustrate the challenges and potential solutions.

Compromised Learning Environment

High heat conditions significantly undermine the comfort and effectiveness of learning environments. As Participant 1 noted, *"High heat conditions compromise learners' comfort, which should be prioritized in a conducive learning environment." When classrooms are too hot, the consequences are evident.*" Also, Participant 6 emphasized that *"high heat conditions lead to learning gaps as classes are often canceled or suspended," disrupting the educational process."*

This disruption has long-lasting effects. Participant 7 observed that classroom instruction suffers, resulting in *"lower performance levels."* Similarly, Participant 8 pointed out that elevated classroom temperatures impact students' *"intellectual capacity due to poor concentration*." Likewise, Participant 9 uttered, *"For*

younger students, such as those in primary grades, high heat can hinder foundational skill development, which may create long-term educational challenges."

Furthermore, participant insights indicate that heat-related issues contribute to absenteeism as identified by Participant 10, a lack of engagement as specified by Participant 11, and a restructured academic schedule that disrupts the curriculum flow as verbalized by Participant 13. Overall, high heat conditions detrimentally affect the quality of education, leading to what P20 described as *"teacher fatigue and burnout"* and a decline in student engagement and cognitive functioning.

In essence, Wargocki et al. (2019) study is interrelated to this recent study since both investigated the effects of temperature in school classrooms on children's performance in school. The cited authors confirmed that there is a significant relationship between the performance of learners in psychological tests and school tasks which can be expected to increase on average by 20% if classroom temperatures are lowered from 30°C to 20°C and that the temperature for optimal performance is lower than 22°C.

Teacher and Student Well-being

The implications of high heat conditions extend beyond academic performance to the overall well-being of teachers and students. Participant 2 highlighted that *"long-term effects include decreased lesson plan effectiveness, reduced student engagement, and increased teacher-student conflict."* This highlights the need to prioritize the well-being of educators and students alike.

Teacher fatigue and burnout are prevalent under high heat conditions, as noted by Participant 3, who remarked on the impact of heat on *"lower pupil participation in class discussions."* Participant 4 added that excessive heat can lead to *"fatigue, dehydration, and health-related illnesses,"* further diminishing a teacher's energy and enthusiasm.

Effective instruction is reliant on focus and mental sharpness, which high temperatures compromise. Participant 5 stated that heat leads to *"reduced focus, fatigue, and decreased instructional quality for both students and teachers."* To counteract these effects, ensuring proper ventilation, hydration, and regular breaks is essential. Participant 15 also emphasized the mental toll of teaching in hot environments, noting that it contributes to *"stress and anxiety for teachers,"* ultimately affecting the classroom atmosphere and instructional quality.

Additionally, the impact of HHI was discussed by De la Pena (2024) emphasized that teachers described the intensity of heat they have experienced in recent days, especially with the heat index, or the level of discomfort a person experiences because of the combined effects of temperature and air humidity, reaching extremely high levels.

Strategies and Adaptations

Despite the challenges posed by high heat, educators are actively seeking strategies to maintain instructional quality. Participant 2 suggested that *"prioritizing teacher well-being and addressing heat-related challenges"* is vital for effective teaching. Moreover, Participant 5 recommended practical solutions such as *"ensuring proper ventilation, hydration, and breaks"* to create a better learning environment. Innovative teaching strategies are essential for adapting to high heat conditions. Participant 10 highlighted the need for teachers to "*think of strategies suitable for high heat conditions to deliver lessons effectively."* By focusing on adaptability and resilience, educators can mitigate some of the negative impacts of heat. Lastly, Participant 19 offered a perspective of optimism, encouraging educators to *"focus on the positive outcomes of the instructional process despite the challenges."* This mindset can help foster a culture of adaptability and resilience within schools facing climate-related challenges.

Navigating high heat index levels during face-to-face classroom discussions requires a proactive and adaptive approach to ensure the well-being and productivity of students and educators. By prioritizing hydration, optimizing ventilation, incorporating interactive teaching methods, and being vigilant for signs of heat-related illness, educators can create a supportive learning environment that promotes student success even during sweltering conditions (Ortiz, 2024).

II. Strategies for Teacher Comfort During High Heat

As temperatures soar, the classroom environment can become increasingly challenging for teachers and students alike. Teachers often find themselves navigating the dual responsibilities of facilitating learning while ensuring their physical comfort during high heat. Based on a series of responses collected from educators, four primary themes emerge that illustrate how teachers adapt to maintain their well-being in such conditions: hydration and ventilation, appropriate clothing, adjusting activities and the environment, and maintaining a positive attitude.

Hydration and Ventilation

One of the most frequently cited strategies among teachers is the importance of hydration and effective classroom ventilation. Participant 1 emphasized the need for learners *"to be properly hydrated and for there to be sufficient airflow in the classroom."* Echoing this sentiment, Participant 2 highlighted the benefits of *"drinking plenty of water, using fans, and keeping windows open to encourage circulation."* Participant 4 and Participant 5 also stressed the importance of "staying hydrated and ensuring that windows are open for airflow," while Participant 7 reiterated the "*effectiveness of fans in conjunction with water consumption to combat the heat."*

Moreover, teachers recognize that hydration extends beyond the classroom. Participant 13 shares a personal strategy of *"taking half baths at night to lower body temperature,"* while Participant 18 advised *"keeping calm and hydrated and suggests avoiding outdoor activities when the heat becomes oppressive."* Participant 20 rounded out this theme by advocating for *"proper ventilation in the classroom, underscoring the collective effort required to maintain a conducive learning environment in hot weather."* Furthermore, Valerio (2024) pointed out the need to address the challenges posed by the heat index since they require proactive adaptation and mitigation strategies at both the institutional and policy levels. Investing in climate-resilient infrastructure and sustainable design practices for schools is essential to creating comfortable, safe learning environments, and implementing heat safety protocols.

Appropriate Clothing

The choice of clothing plays a significant role in how teachers cope with high temperatures. Many participants recommend lightweight, loose-fitting, and breathable fabrics. Participant 2 mentions "*wearing light-colored clothes made from breathable materials such as cotton,"* while Participant 4 emphasized the importance of *"dressing appropriately for the heat."* This sentiment is echoed by Participant 5, Participant 8, and Participant 11, who all highlighted the *"comfort of breathable clothing."* Participant 19 even took this a step further by "*advocating for a dress code that encourages students to wear comfortable clothing, recognizing that physical comfort enhances the learning experience for everyone."*

In line with this result, Bordey (2024) reported that the Division of City Schools of Manila has allowed teachers and students to wear comfortable clothes amid the sweltering heat on campuses. According to Division Memorandum No. 123, series of 2024, teachers and students can wear more comfortable clothing aside from their regular uniforms to reduce the heat they feel while inside the schools.

Adjusting Activities and Environment

Recognizing that high temperatures can impact both physical and cognitive performance, teachers also

adapt their lesson plans and activities. Participant 3 noted the use of *"comfortable clothes while adjusting lessons to prevent overheating during physical activities."* Participant 4 suggests *"taking frequent breaks in shaded areas and avoiding strenuous activities,"* which is echoed by Participant 9, who recommended *"minimizing physical exertion and incorporating engaging activities that require less movement."* Participant 11 advocated for *"providing easy and interesting tasks that keep students engaged without adding to their discomfort."*

In addition, Participant 15 highlighted the *"importance of timing, suggesting that limiting physical activity during the hottest parts of the day and taking lessons outdoors when possible can help alleviate discomfort."* Participant 19's strategy of *"starting classes early to avoid peak heat"* further underscored the significance of environmental adjustments to enhance comfort and learning.

Meanwhile, Hagerman (2024) explained that the federal Occupational Health and Safety Administration (OSHA) standard to protect workers from heat has been in the works for years. OSHA asked for feedback and many educators offered perspectives. According to them, illness is preventable: listening to workers to develop a heat prevention plan and enacting measures like paid breaks in cool spaces, access to water, and limiting time exposed to heat will save lives and make work more productive and safe,

Maintaining a Positive Attitude

Finally, amidst the challenges posed by high heat, maintaining a positive attitude emerges as a crucial strategy. Participant 11 noted the importance of *"staying positive,"* while Participant 17 emphasizes the benefits of *"remaining calm and relaxed when facing the heat."* These attitudes not only help teachers manage their discomfort but also create a supportive environment for their students, who are likely to mirror their teachers' responses.

Managing Emotional Stress for Teachers in Extreme Heat

Teaching during extreme heat can be a challenging endeavor, often leading to increased emotional stress among educators. However, through various strategies, teachers can effectively manage this stress and maintain a positive classroom environment. The insights from several teachers provided valuable perspectives on how they cope in such conditions, categorized into four primary themes: Staying Calm and Positive, Self-Care and Hydration, Adjusting Teaching Strategies, and Support Systems.

Staying Calm and Positive

A recurrent theme among the teachers interviewed is the importance of maintaining a calm and positive demeanor in the classroom. Teacher Participant 1 emphasized that educators should *"adapt to the classroom environment and not allow the extreme heat to disrupt lesson delivery."* Similarly, Participant 3 advised *"against assigning challenging activities during hot days, as this can exacerbate stress levels for both teachers and students."* Participant 6 reinforced the necessity of *"remaining calm,"* while Participant 7 suggested that *"taking occasional breaks outside can help alleviate tension."* Other teachers, like Participant 11 and Participant 17, advocated for *"stress management practices, such as staying cool, focusing on the task at hand, and maintaining a cheerful disposition."* Participant 19 encapsulated this sentiment by *"reminding educators that good times will eventually follow tough moments, promoting a positive outlook."*

Self-Care and Hydration

Self-care emerges as a vital strategy for managing stress during extreme heat. Participant 2 underscored the significance of "*coping mechanisms and support systems, emphasizing the need for adequate rest, realistic expectations, and comfortable attire."* Participant 4 suggested that *"teachers take regular breaks to cool off and recharge, allowing for flexibility in lesson planning."* Hydration is a common concern,

highlighted by Participant 5, who insisted on the importance of *"drinking water, dressing comfortably, and using fans to improve airflow."* Participant 9 echoed this advice, *"recommending the use of fans and keeping windows open to enhance comfort levels."* Overall, teachers like Participant 20 *"prioritize self-care and hydration as essential components in adapting their instructional strategies."*

In line with the given accounts, Wickerson et al. (2024) highlighted the positive attitudes and actions by the federal agencies in the United States where there is a need to collaborate and collect data to better understand and drive mitigation efforts to prepare for extreme heat for schools. They believed that opportunities exist across the federal government to protect the nation's future by protecting the children. Federal agencies can best support state and local schools through three paths of mitigation: collect data and collaborate, set policy, and invest in schools.

Adjusting Teaching Strategies

In addition to personal care, teachers recognize the need to modify their teaching strategies to accommodate the challenging conditions. Participant 4 noted that "*making lessons more engaging and enjoyable"* can significantly reduce student frustration and teacher stress. Participant 15 reinforced this idea by *"reminding educators of their passion for teaching and the importance of creating a supportive classroom atmosphere."* Participant 16 introduced the concept of *"mindfulness, suggesting breathing exercises and prayer to help manage stress while maintaining a positive focus on student outcomes."* Participant 18 stressed that *"emotional management is crucial for effective teaching,"* while Participant 20 emphasized the importance of *"fostering a collaborative environment, allowing students to feel comfortable and engaged despite the heat."*

By prioritizing hydration, optimizing ventilation, incorporating interactive teaching methods, and being vigilant for signs of heat-related illness, educators can create a supportive learning environment that promotes student success even during sweltering conditions. (Will, 2024)

Support Systems

Finally, the role of support systems cannot be underestimated in managing emotional stress. Participant 2 highlighted the importance of *"relying on family and friends for relaxation and emotional support* during difficult times". This social support network can be invaluable in helping teachers decompress and recharge.

Shortridge's (2024) study served as a starting point for creating and operationalizing an evaluation rubric for schools, community partners, health departments, and researchers to use for smaller-scale heat preparedness efforts. Efforts to make schools HeatReady are an essential step towards ensuring that future generations have access to comfortable and safe learning environments without risks associated with heat exposure, even as temperatures rise in cities across the globe.

Keeping Students Comfortable and Focused on Hot Days: Teacher Strategies

As temperatures rise, maintaining student comfort and focus in the classroom becomes a significant challenge for teachers. Based on recent feedback from educators, several themes emerged detailing the techniques they employ to ensure their students remain engaged, comfortable, and hydrated during sweltering days. Here's a breakdown of these strategies, categorized into four key themes: hydration and ventilation, comfortable clothing and environment, adjusting activities and teaching strategies, and creating a positive classroom environment.

Hydration and Ventilation

One of the primary concerns during hot days is student hydration. Participant 1 emphasized the importance of *"ensuring students are well-hydrated while providing enjoyable activities that require less movement."*

In a similar vein, Participant 2 advocates for the" use *of fans and suggests rearranging seating for improved airflow."* This proactive approach is echoed by Participant 3, who requested students to *"bring adequate water and reconfigure chairs to prevent overcrowding."*

Moreover, teachers like Participant 4 had taken practical steps by "*employing electric fans, opening windows, and advising students on appropriate clothing for heat management."* Regular hydration is crucial, as highlighted by Participant 5, who encourages students to *"drink water every hour and schedule frequent breaks to cool down."* Participants 7 and 20 further emphasized the need for *"hydration and classroom ventilation, ensuring that students remain refreshed and attentive."*

In connection to the theme presented, the Philippine Red Cross (PRC) reminded the public including the school learners to stay hydrated and in well-ventilated areas to avoid the effects and dangers of heat indexes consistently recorded in the previous days of April (Sarao, 2024).

Comfortable Clothing and Environment

Another significant theme that emerged is the promotion of comfortable clothing and a conducive environment. Participants 1 and 4 both encouraged students to *"wear breathable and appropriate clothing for the heat."* Participants 9 and 18 advocated for *"relaxed dress codes that allow for thin clothes, fostering a comfortable learning atmosphere."* By creating an environment that permits comfortable attire, teachers can significantly enhance students' ability to focus and engage during lessons, as discussed by Participant 19, who highlighted the need for a "*well-ventilated classroom."*

Significantly, the Division of City Schools of Manila has allowed teachers and students to wear comfortable clothes amid the sweltering heat on campuses. According to Division Memorandum No. 123, series of 2024, teachers and students can wear more comfortable clothing aside from their regular uniforms to reduce the heat they feel while inside the schools (Bordey, 2024)

Adjusting Activities and Teaching Strategies

Adjusting classroom activities and teaching strategies is essential for maintaining student engagement during hot weather. Participant 1 stressed the need for *"enjoyable activities with minimal movement,"* while Participant 2 recommended "*scheduling outdoor activities for cooler parts of the day."* Regular short breaks, as advocated by Participant 5, helped students *"cool down and recharge, allowing them to remain focused throughout lessons."*

Furthermore, Participant 9 suggested "*minimizing outdoor activities and incorporating engaging indoor projects, such as drawing and crafts."* Creative teaching methods were also embraced by Participant 11, which utilized *"songs, rhymes, and games to maintain a lively classroom atmosphere."* This innovative approach to lesson delivery was complemented by Participant 15's strategy of *"breaking down lessons into smaller segments, thus avoiding intense physical exertion."* Participant 16 added that imaginative activities, such as *"traveling around the world"* through interactive learning, can also effectively captured students' attention.

It is good to note that Nidhi et al., (2023) revealed that in Phoenix, which recorded daily highs at or above 110 F for 31 consecutive days in July, the daily heat index is also carefully monitored by schools. Under certain heat index conditions, students are restricted from outdoor activity and teachers stay on high alert for signs of heat stress in students. Also, at Dunbar Elementary School in downtown Phoenix, hot days mean having free time to use the school's air-conditioned science, technology, engineering, arts, and mathematics laboratory. The school also offers planned activities, such as dancing, games, and more, in its gymnasium on extreme heat days. Hot classrooms can be detrimental to both student health and education.

Creating a Positive Classroom Environment

Finally, establishing a supportive and positive classroom environment is crucial for managing the challenges posed by hot weather. Participant 13 highlighted the importance of *"helping students understand and accept the discomfort that may accompany high temperatures." "Creating a relaxed atmosphere,"* as suggested by Participant 15, minimized stress and allowed for better concentration. Participant 17 reinforced this by "*using meaningful and visually engaging learning materials*" that keep students engaged.

In the same wavelength, Cariaso (2023) stated that aside from the shift to distance learning, the Teachers' Dignity Coalition (TDC) pushed for shortened teaching time and smaller class sizes to address the extreme heat during summer. In a statement, TDC chairman Benjo Basas acknowledged a recent memorandum issued by the Department of Education (DepEd), which reiterated its policy of suspending in-person classes during unfavorable weather conditions. An immediate shift to the old calendar, he pointed out, could affect the two-month break for teachers and students. *"A more strategic approach is needed, for example, a class size of no more than 25 students, more stable classrooms designed for student comfort and provision of electric fans or even air-conditioning system. Certainly, we will need funds and policies to implement such,*" he added.

Balancing Instructional Quality Amid Heat-Related Stress: Insights from Educators

As temperatures rise, teachers face the challenge of delivering quality education while contending with the discomfort and distraction of heat-related stress. Insights gleaned from educators reveal a variety of strategies employed to maintain instructional integrity, with responses categorized into key themes. These themes include adjusting lessons and activities, prioritizing self-care, encouraging student independence, managing classroom environments, and fostering a positive mindset.

Adjusting Lessons and Activities

A significant strategy employed by teachers involved the modification of lessons and activities to reduce physical strain and enhance engagement. Participant 1 noted the importance of *"crafting lessons that require less movement"* but still kept students engaged and enjoying their learning experiences. Similarly, Participant 3 emphasized the need for "*flexibility in lesson plans,"* focusing on activities that demand minimal energy from students. This adaptive approach allowed teachers to ensure that the core objectives of lessons are met without overwhelming students in the heat.

Participants like 9 and 13 further underscored the importance of "*essential activities and manageable lesson segments,"* respectively. Participant 9 advocates for "*modifying activities to minimize heat stress,*" while Participant 13 *"breaks down lessons into smaller parts*" to help maintain students' focus. This strategy is complemented by Participant 14, who suggested *"adjusting performance expectations"* and opting for flexible activities that are less taxing. Participant 15 reinforced the necessity of *"being prepared to modify plans"* as circumstances demand. Moreover, Participants 16 and 17 proposed "*utilizing engaging materials and multimedia resources,"* respectively, to sustain instructional quality and captivate students' attention despite the discomfort of heat.

Prioritizing Self-Care and Rest

In addition to adapting lessons, teachers recognized the significance of self-care in managing heat-related stress. Participant 2 emphasized the importance of "*prioritizing essential learning objectives"* while also leveraging technology to assist in this endeavor. "*Setting realistic goals and seeking support*" is crucial, as highlighted by Participant 5. Both participants stressed the need for teachers to rest and take care of themselves to ensure their well-being, which ultimately impacts their effectiveness in the classroom.

Participant 18 added that *"staying mentally and physically focused"* is key to avoiding illness and maintaining a productive learning environment.

Encouraging Student Independence

Another effective strategy involves fostering student independence. Participant 4 articulated the need "*to create a classroom environment where students take ownership of their learning.*" This included utilizing research, collaborative groups, and educational apps to facilitate learning. By promoting independence, teachers can alleviate some of the pressure they face while ensuring that learning continues. Participant 19 also emphasized *"following instructional guides"* to achieve desired learning outcomes, which helped maintain structure and consistency.

Taking Breaks and Managing Classroom Environment

Managing the classroom environment and incorporating breaks into the daily routine is another essential strategy. Participant 6 emphasized the importance of *"continuing instruction"* while also pausing as needed if students showed signs of discomfort. *"Taking cool-down breaks,"* as suggested by Participant 11, can help alleviate the effects of heat and allow students to regain their composure. These breaks were vital for maintaining a conducive learning environment even in adverse conditions.

In line with this, Davies (2024) provided some tips to keep kids safe during high heat index. He mentioned that light-colored clothing can help kids stay cool and prevent heat stress from excessive heat absorption; darker-colored clothes typically provide slightly better sun protection. Also, loose-fitting clothing offers both adequate ventilation and protection against direct sun exposure. Clothing made with just one layer of absorbent material can help maximize the evaporation of sweat, which has a cooling effect. Moreover, planning for extra rest time should be considered to fight tiredness and irritability.

Maintaining a Positive Attitude

Finally, teachers recognized the power of a positive attitude in overcoming heat-related challenges. Participant 7 adopted an approach of "*ignoring the heat and persisting with teaching,"* while Participant 18 echoed the sentiment of *"staying mentally focused*" to mitigate any potential health issues. This optimistic outlook not only benefited teachers but also set a positive tone in the classroom, encouraging students to remain engaged despite discomfort.

To support the need to adjust lessons and activities, Casucian (2024) wrote that the city of Makati has announced changes that will be implemented on class schedules following the consistently high level of Heat Index in Metro Manila. According to the "24 Oras" reported by Tina Panganiban-Perez on Wednesday, classes in public schools in Makati City have been adjusted to 6 a.m. to 10 a.m. for morning classes and 3:30 p.m. to 7:30 p.m. for afternoon classes.

Navigating the Heat: Advice for New Teachers on Managing High-Heat Conditions

As temperatures rise, classrooms can transform into stifling environments that pose challenges for both teachers and students. New teachers, in particular, may find themselves unsure of how to maintain a productive learning atmosphere while prioritizing the health and comfort of everyone involved. To support educators facing these high-heat conditions, several key themes have emerged from discussions with experienced teachers.

Prioritizing Health and Comfort

A consistent piece of advice is to stay calm and prioritize health—both for teachers and learners. According to Participant 1, it is crucial to maintain a *"focus on health"* to ensure quality instruction continues, even in uncomfortable conditions. Participant 6 emphasized the importance of *"wearing comfortable, breathable clothing and maintaining a well-ventilated classroom."* Participant 2 suggested

"using fans, shades, or blinds to enhance airflow," while Participant 5 advocated ensuring students *"stay hydrated"* throughout the day. Participant 13 highlighted the importance of *"taking breaks and protecting oneself"* from heat-related illnesses, reinforcing the notion that the well-being of both teachers and students should come first. Participant 15 succinctly encapsulated this sentiment by urging educators to always *"prioritize health and comfort."*

Adjusting Classroom Environment and Activities

In addition to prioritizing health, new teachers are encouraged to make necessary adjustments to their classroom environment and activities. Participant 2 suggested "*leveraging technology"* for efficient teaching and communicating with parents about heat safety measures, emphasizing flexibility and adaptability in lesson plans. Participant 3 agreed, urging educators to *"stay calm and cool"* while crafting flexible lessons that students can complete with relative ease. Participant 4 emphasized the importance of *"classroom layout,"* advocating for adjustments that enhance air circulation and avoid overcrowding. Modifying activities to minimize physical movement is crucial, as outlined by Participant 11, who stressed the need for *"patience and the implementation of appropriate activities"* that suit the climate. Participant 16 encouraged teachers to *"contextualize their lessons"* to keep students engaged, even amid the sweltering heat, while Participant 17 encouraged a *"gentle and caring approach"* to managing students during these challenging conditions.

Maintaining a Positive Attitude and Resilience

Resilience and a positive attitude play pivotal roles in managing high-heat conditions. Participant 1 encouraged educators to "*remain calm and not let the heat affect their health"* or the quality of instruction. Participant 3 reiterated this, emphasizing the need to *"maintain composure."* Participant 9 shares that being *"adaptable to changes"* is essential for overcoming the challenges posed by high temperatures. Participant 18 inspired teachers to *"face difficulties professionally,"* urging them to think of solutions rather than succumb to stress and frustration. Participant 20 encapsulated this advice by emphasizing the importance of *"staying hydrated and enforcing discipline"* to minimize excessive physical movement, reinforcing a proactive approach to managing classroom dynamics in the heat.

Encouraging Student Independence and Engagement

Lastly, the theme of encouraging student independence and engagement emerged strongly. Participant 4 highlighted the significance of *"fostering independence"* by teaching students how to research topics, collaborate with peers, and utilize educational apps and online resources. Participant 16 built on this idea, advocating for the *"contextualization of lessons"* to keep students actively participating, even when faced with uncomfortable conditions. By nurturing a sense of independence, teachers can help students take ownership of their learning while also alleviating some of the pressures on educators.

The four emerging themes from the participant's responses during focus-group-discussion are reinforced by the concepts presented by Cabico (2023) attesting that the Department of Health (DOH) reminded teachers and students about the impacts of summer heat on their health as well as the conduct of classroom learning. In a briefing, Health officer-in-charge Maria Rosario Vergeire urged parents and students to remind children to drink water often, make children wear light clothes so they are comfortable, do not go or play outside when sunlight is intense, and always bring an umbrella. She also reminded teachers and school personnel to open windows and doors of classrooms and turn on fans during classes.

III. Navigating Hot Days: Teacher Adaptations to Lesson Plans

As temperatures soar during the summer months, educators face the unique challenge of maintaining student engagement and learning effectiveness while ensuring the well-being of their students. The

following article explores how teachers adapt their lesson plans on particularly hot days, drawing from responses categorized into five key themes: simplifying and shortening lessons, reducing physical activities, adjusting the classroom environment and schedule, fostering engaging and interactive activities, and embracing flexibility and adaptation.

Simplifying and Shortening Lessons

A common strategy among teachers is to simplify and shorten lessons to accommodate the heat. For instance, Participant 2 emphasized the need to "*simplify complex topics, reduce physical exertion, and incorporate quiet, seated tasks alongside multimedia resources.*" Similarly, Participant 3 noted the effectiveness of *"shortening lessons and relying on visual aids or audiovisual materials"* to keep students engaged without overexerting them. Participant 7 added that while brevity is crucial, "*lessons should still meet essential learning objectives.*" Others, like Participant 14, advised "*avoiding outdoor activities*" entirely, while Participant 15 suggested *"breaking down longer lessons"* into shorter segments that lessen cognitive demands. This approach not only helps maintain students' focus but also ensures they do not become overwhelmed by the heat.

Reducing Physical Activities

Reducing physical activities emerged as another prominent theme in teacher adaptations. Many educators, such as Participants 2 and 3, reported *"minimizing physical exertion and promoting quieter tasks."* Participant 4 shared that they incorporate more group work focused on "*discussions rather than active tasks,"* while Participant 6 advised "*avoiding any activities that require significant movement."* Participant 9 highlighted the importance of ensuring that *"activities remain non-strenuous,"* and Participant 11 echoed this sentiment by suggesting a "*modification of activities"* to limit energy expenditure. Additionally, Participants 16 and 18 noted a shift from "*group to individual activities"* that can be conducted in shaded areas, further reinforcing the idea of maintaining a safe learning environment on hot days.

Adjusting Classroom Environment and Schedule

To combat the heat, several teachers proposed adjustments to the classroom environment and daily schedule. For example, Participant 4 suggested *"modifying lesson content*" to be more engaging while ensuring topics remain relevant. Participant 5 recommended, "*incorporating more indoor activities, providing frequent water breaks, and adjusting the schedule to include quieter tasks during the hottest hours of the day.*" This aligns with Participant 13's observations about "*adjusting class hours*," beginning lessons earlier, reducing class time, and emphasizing hydration. These strategies reflect a comprehensive approach to ensuring that students remain comfortable and focused throughout their lessons.

Engaging and Interactive Activities

Despite the challenges posed by the heat, many educators remain committed to creating engaging and interactive lessons. Participant 1 discussed the importance of "*finding innovative ways"* to captivate students and tailoring lessons to their needs and interests. P4 reiterated the value of interactive lessons, incorporating group work and discussions to maintain engagement. Participant 19 highlighted the necessity of "*integrating strategies*" to help students cope with the heat while staying focused on essential learning objectives. These efforts underscore the resilience and creativity of teachers in fostering a stimulating learning environment even in adverse conditions.

Flexibility and Adaptation

Lastly, flexibility and adaptation emerged as vital components of lesson planning on hot days. Participant 17 succinctly captured this sentiment, stating the importance of "*adjusting lessons"* as necessary to

accommodate the heat. This adaptability not only showcases teachers' commitment to their students' well-being but also illustrates the dynamic nature of teaching, where responsiveness to environmental factors is crucial for effective learning.

The five key themes presented above were supported by Ortiz (2024) highlighting that navigating high heat index levels during face-to-face classroom discussions requires a proactive and adaptive approach to ensure the well-being and productivity of students and educators. By prioritizing hydration, optimizing ventilation, incorporating interactive teaching methods, and being vigilant for signs of heat-related illness, educators can create a supportive learning environment that promotes student success even during sweltering conditions.

Additionally, the strategies presented by the participants are in line with the tips presented by Davies (2024) stating that when the heat index rises staying inside to work on crafts, reading, or playing board games makes the most sense. She also pointed out to plan ahead if there will be several days of high heat in a row, think of creative ways to have kids switch up their activities and avoid restless and irritable feelings, and help them stay active.

Teaching in the Heat: Strategies for Engaging Students

As the temperature rises, educators face unique challenges in maintaining student engagement and learning efficacy. Teachers have shared their creative approaches to modifying classroom activities in high-heat conditions, demonstrating resilience and adaptability. These strategies can be classified into five key themes: low-energy and indoor activities, the use of technology and multimedia, group and pair activities, creative and engaging activities, and maintaining a comfortable classroom environment.

Low-Energy and Indoor Activities

Many educators emphasized the importance of reducing physical exertion during hot weather. For instance, Participant 1 suggested *"creating games"* that require less movement yet remain enjoyable. Similarly, Participant 2 proposed a "*focus on indoor activities"* such as reading, listening exercises, and educational videos. To further alleviate the heat's impact, Participant 3 recommended *"preparing worksheets and shortening discussions,"* while Participant 5 advocated for "*interactive, hands-on lessons"* integrated with educational games and storytelling. Participant 9 highlighted the value of "*arts and crafts,"* whereas Participants 13 and 14 both favored "*low-energy activities"* like puzzles and board games to keep students engaged. The common thread across these responses is a shift towards activities that promote learning while minimizing physical strain.

Use of Technology and Multimedia

Embracing technology became a pivotal strategy for many educators to sustain student engagement. Participant 4 noted the effectiveness of "*using videos to supplement lessons and foster interactivity among students."* Participant 5 highlighted the "*integration of educational games"* that also allows for cooling breaks, ensuring that students stay refreshed while learning. This reliance on multimedia not only serves to keep the classroom dynamic but also caters to various learning styles, making lessons more accessible and enjoyable during sweltering days.

Group and Pair Activities

Collaborative learning emerged as another favored approach, allowing students to engage with one another while reducing the need for extensive movement. Participant 4 recommended "*more group discussions to facilitate understanding"* through shared ideas. Participants 6 and 7 emphasized the importance of "*pairing students to avoid congestion"* and create a manageable classroom environment. Participant 16 also echoed this sentiment by "*advocating for peer activities*, "which promote brainstorming and

information gathering in a less physically demanding format. These strategies not only encourage teamwork but also enable teachers to maintain control over the classroom dynamics, even in the heat.

Creative and Engaging Activities

Creativity played a significant role in keeping students engaged. Participant 11 encouraged activities such as "*singing, dancing, and art projects,"* recognizing that these could energize the classroom while accommodating the heat. Participant 15 took this a step further by suggesting *"outdoor activities when possible,"* allowing students to engage with different learning environments. Meanwhile, Participant 17 emphasized the need to "*balance necessary learning with enjoyable activities,*" ensuring that students remained interested and involved even when temperatures soared.

Classroom Environment and Breaks

The physical classroom environment also received attention, with several educators advocating for regular breaks and hydration. Participant 5 noted the importance of "*frequent water breaks*" to keep students refreshed, while Participant 18 suggested engaging students through "*individual activities during hot periods*" to reduce the need for extensive group work. Participant 19 highlighted the necessity of "*ensuring adequate ventilation with fans and encouraging water consumption.*" By creating a comfortable classroom atmosphere, educators can enhance students' focus and participation, making learning more effective.

Meanwhile, the five key themes obtained from participants' responses have emphasized the views shared by Hernando-Malipot (2024) that water breaks in each lesson should be observed to keep children hydrated. Moreover, ensuring well-ventilated rooms, and avoiding afternoon classes must be considered. Also, scheduling modular lessons whenever possible, especially during peak heat waves is encouraged.

Furthermore, Will (2022) reiterated that some schools dismiss students early during extreme heat, and others cancel classes entirely. His research suggests that school districts cancel school for heat an estimated average of six or seven days per year—up from three or four days a decade ago.

Assessing Student Learning During Extreme Heat: Teachers' Strategies and Insights

As climate change continues to manifest through increasingly extreme weather conditions, educators face unique challenges in maintaining effective learning environments. One particularly pressing issue is how extreme heat affects students' ability to learn and how teachers assess their comprehension and engagement during these conditions. Drawing from responses gathered from various educators, we can categorize their strategies into five primary themes: formative and summative assessments, observations and monitoring, student self-assessment and feedback, technology-enhanced assessments, and communication and adaptation.

Formative and Summative Assessments

Teachers recognized the importance of continuous assessment in ensuring students are learning effectively, particularly during extreme heat. Participant 2 emphasized the "*use of formative assessments"* such as quizzes, observations, and exit tickets alongside summative assessments, which include project-based evaluations. Similarly, Participant 3 advocated for "*incorporating reflections and journal entries*" to gauge understanding. Participant 4 reiterated the significance of *"formative techniques to check for comprehension and suggested using quizzes and projects as summative tools to monitor overall progress."* The approaches vary but share a common goal of maintaining academic rigor while being responsive to the heat-induced stress students may face. For example, Participant 5 emphasized "*checking for understanding"* through brief verbal or written quizzes, contrasting current work quality with previous assignments to measure growth. Participant 18 reiterated the necessity of "*regular formative assessments*

to gauge student learning effectively." By combining diverse assessment methods, educators aim to create a more resilient learning framework that adapts to students' needs.

Observations and Monitoring

Beyond formal assessments, observational strategies play a crucial role in understanding student well-being and engagement during extreme heat. Participant 1 highlighted the need to "*monitor students' physical and cognitive states*," as well as their academic performance. Participant 2 echoed this by "*noting the use of anecdotal records"* to document observations and monitor student well-being in the context of heat stress.

Participants 4 and 5 further illustrated the importance of "*observing student behavior and engagement during lessons."* Participant 4 mentioned observing "*interactions among students,"* while Participant 11 focused on "*students' efforts to complete seatwork activities*." Monitoring student attention and engagement became pivotal as well, with Participant 15 noting the necessity of being "*alert to signs of disengagement*." Such insights underscore the need for a holistic approach to monitoring, ensuring that students' emotional and physical health is prioritized alongside their academic success.

Student Self-Assessment and Feedback

Encouraging students to take an active role in their learning can be particularly effective during challenging weather conditions. Participant 2 suggested using *"self-assessment rubrics or checklists,*" enabling students to evaluate their understanding and engagement independently. Meanwhile, Participant 16 emphasized the use of "*oral recitations supplemented by visual aids"* to maintain student interest and assess comprehension. These strategies not only empower students but also provide teachers with critical insights into individual learning journeys.

Technology-Enhanced Assessments

The integration of technology in assessments is increasingly viewed as a means to enhance learning and mitigate stress during extreme heat. Participant 2 mentioned the "*effectiveness of online quizzes and tests"* as a way to conduct assessments more flexibly. Participant 20 expanded on this notion, advocating for *"technology use in presentations and assessments to streamline processes and reduce the pressure on students."* By harnessing technology, educators can create more engaging and interactive learning experiences, helping to offset some of the negative impacts of extreme heat.

Communication and Adaptation

Effective communication with parents and guardians is vital during periods of extreme heat. Participant 2 pointed out the importance of '*keeping families updated on student progress* "and making heat-specific accommodations, such as modifying assignments to better suit students' capacities. Participant 17 added that "*checking for correct answers to questions"* is a straightforward yet effective method of assessing understanding, particularly when combined with open lines of communication. This adaptability not only fosters a supportive learning environment but also reinforces the partnership between educators and families in navigating challenges.

The five primary themes presented and discussed above namely, formative and summative assessments, observations and monitoring, student self-assessment and feedback, technology-enhanced assessments, and communication and adaptation are backed up by the concepts presented by Yale Porvu Center for Teaching and Learning (2024) claiming that instructors can improve student motivation and engagement by making visible opportunities to close gaps between current and desired performance, especially during situations that entail adjustments of both teachers and learners. Examples of these include opportunities

for resubmission, specific action points for writing or task-based assignments, and sharing study or process strategies that an instructor would use to succeed.

In addition, the effective use of digital learning tools in classrooms can increase student engagement, help teachers improve their lesson plans, and facilitate personalized learning. It also helps students build essential 21st-century skills. Virtual classrooms, video, augmented reality, and other technology tools can not only make classes more lively but can also create more inclusive learning environments that foster collaboration and inquisitiveness and enable teachers to collect data on student performance. Still, it's important to note that technology is a tool used in education and not an end in itself. The promise of educational technology lies in what educators do with it and how it is used to best support their students' needs. (American University Washington D.C., 2020)

Teacher Adaptations to High Heat: Insights from Student Feedback

As the temperature rises, teachers are faced with the challenge of maintaining a conducive learning environment for their students. The feedback received from students regarding the adaptations implemented by their teachers in response to high heat reveals a spectrum of sentiments that highlight both successes and areas for improvement. This article discusses the themes emerging from student feedback, including positive appreciation, suggestions for improvement, complaints about challenges, and mixed feedback.

Positive Feedback and Appreciation

Many students expressed their gratitude towards teachers for the measures taken to combat the discomfort caused by high temperatures. For instance, Participant 2 noted an appreciation for "*flexible scheduling*," indicating that the teachers' understanding and support played a significant role in alleviating stress. Similarly, Participant 4 highlighted the "*positive impact of electric fans and open windows,*" which contributed to a more comfortable classroom atmosphere. The "*allowance of hydration and comfortable clothing*," as mentioned by Participant 9, further enhanced students' learning experiences.

Moreover, Participant 13 observed that "*students remained engaged and motivated through performance-based assessments and collaborative learning,"* with many students expressing their appreciation for the innovative teaching methods used during these challenging conditions. Participants 14 and 16 echoed this sentiment, "*emphasizing how comfortable and relaxed they felt while learning in such adaptations*." Participant 17 highlighted the crucial aspects of "*comfort, hydration, and a supportive learning environment,"* while Participant 19 pointed out the "*benefits of self-directed learning through modules,"* which fostered critical thinking skills.

Furthermore, the benefit of positive feedback is creating a positive cycle of behavior. When people receive positive feedback, they are more likely to continue performing well, leading to even more positive feedback. This cycle of positivity can lead to a more positive work or learning environment, leading to higher levels of success and satisfaction even during unpleasant conditions like high heat index in classrooms. (Impact Futures, 2024)

Suggestions for Improvement

Despite the commendable efforts made by teachers, students provided constructive feedback aimed at further enhancing their learning experience. Participant 2 suggested "*incorporating more frequent breaks into the schedule*," acknowledging that this could help students cope better with the heat. In a similar vein, Participant 5 requested "*additional fans or air conditioning and advocated for more water breaks*." They also suggested that outdoor activities be held indoors or in shaded areas to mitigate the effects of the heat.

Such feedback reflects a desire for continuous improvement and adaptation to meet the needs of students during hot weather.

In the Philippines, there is a need for action to deal with extreme heat inside the classrooms now and shortly, including the start of the next school year. Among the recommendations presented by teachers' groups are: the building of adequate classrooms with proper ventilation, avoiding large classes that cause overcrowding, hiring more support personnel like health workers who will manage in-school health facilities, and providing more water fountains around the school. (Manila Bulletin, 2024

Complaints and Challenges

Not all feedback was entirely positive. Some students voiced their frustrations regarding the heat, as seen in the comments from Participant 1, who noted "*persistent complaints about high temperatures despite the teachers' efforts.*" Participant 3 mentioned that students sometimes "*sought outdoor activities for more space and air,"* indicating a struggle with indoor conditions. Participant 5 reiterated this challenge, stating that the "*heat made concentration difficult,"* while Participant 6 simply expressed "*their ongoing discomfort*." The restlessness among students was also noted by Participant 11, further underscored *"the challenges posed by high heat."*

In essence, Chitrakar & P.M. (2023) study restated that frustrating situation impacts students learning. Nowadays students are more frustrated due to academic pressures, persistent challenges or obstacles in their studies, etc. These situations lead to mental stress, lack of motivation, decreased self-esteem, and a decline in academic achievement among students. Frustration among students and to make them motivated, and successful learners.

Mixed Feedback

Lastly, *"feedback varied across different learner demographics,"* as observed by Participant 13. While some students appreciated the adaptations made, others expressed concerns and dissatisfaction. This mixed feedback highlights the importance of recognizing the diverse needs of students and tailoring responses accordingly to create an inclusive learning environment.

Feedback improves the learning experience for the students and this has also a significant effect on professionalizing teaching. However, feedback is considered a difficult issue when it is unable to satisfy the students in improving their learning experience. That is why teachers must re-think about the feedback-providing process. They should avoid the traditional way of providing feedback to the students which sounds negative and hurtful. (Bashir, Kabir, & Rahman, 2016)

IV. Supporting Teachers in Times of High Heat: Strategies from School Heads

As the temperature rises during the summer months, schools face unique challenges that can impact the well-being and effectiveness of teachers and students alike. The need for proactive measures becomes increasingly apparent, prompting school heads to implement various strategies to support their teachers during these sweltering periods. An analysis of responses from school heads reveals several key themes that highlight their initiatives aimed at fostering a conducive teaching and learning environment amidst high heat conditions.

Providing Cooling Equipment and Resources

One of the most immediate actions taken by school heads is the provision of cooling equipment. Participant responses indicate a consistent focus on acquiring electric fans to alleviate discomfort in classrooms. For instance, Participant 1 noted the importance of *"purchasing new electric fans for classrooms,"* echoing sentiments shared by Participant 3 and Participant 11, both of whom emphasized the *"necessity of providing more electric fans to enhance air circulation.*" Furthermore, Participant 5

expanded on this by "*discussing the provision of fans"* alongside proper ventilation and encouragement of frequent water breaks. This multifaceted approach aims to ensure that teachers and students remain comfortable, thus promoting a more effective learning environment.

In addition to fans, access to potable drinking water is highlighted as a crucial resource. Participant 14 emphasized the need for adequate resources like electric fans and potable drinking water stations, while Participant 6 also stressed the importance of "*repairing existing fans and ensuring enough drinking water."* These responses collectively underscore the recognition that hydration and cooling are essential for maintaining focus and productivity in the classroom during extreme heat.

In line with this, Sylvester's (2019) findings showed that heat waves, accommodation conditions, social, learning, and physical environment significantly affect students learning among university students in summer. His study recommended that the government should ensure building engineers equip each room in an apartment with air conditioning and solar panels to ease the payment of electricity for students.

Adjusting Schedules and Activities

Recognizing that the heat can impede the traditional learning process, school heads are also adjusting schedules and activities. Participant 2 shared insights on "*rescheduling outdoor activities"* and offering temporary online learning alternatives to avoid peak heat hours. Similarly, Participant 4 highlighted the "*adjustment of the school day's start"* and end times to circumvent the hottest parts of the day. This flexibility in scheduling reflects a broader understanding of the need to adapt to environmental conditions to maintain a positive learning atmosphere.

Moreover, the allowance for shortened class periods and early dismissals, as mentioned by Participants 11 and 13, illustrated a commitment to *"prioritizing the well-being of students and teachers."* Participant 16 suggested a *"creative solution of implementing modular learning,"* which allows for a more fluid teaching approach during the hotter parts of the day, showing that school heads are not only reactive but also innovative in their responses.

Interestingly, Hagerman (2024) explained that the federal Occupational Health and Safety Administration (OSHA) standard to protect workers from heat has been in the works for years. OSHA asked for feedback and many educators offered perspectives. According to them, illness is preventable: listening to workers to develop a heat prevention plan and enacting measures like paid breaks in cool spaces, access to water, and limiting time exposed to heat will save lives and make work more productive and safer,

Encouraging Comfortable Clothing and Hydration

Another prominent theme is the encouragement of comfortable clothing and hydration practices. Responses from Participants 9 and 11 revealed a consensus on "*allowing teachers to wear comfortable, non-uniform clothing to promote ease during the heat.*" This policy shift not only addresses the discomfort caused by traditional attire but also reflects a deeper understanding of the impact of clothing on teachers' performance and morale.

The emphasis on hydration is also apparent, with Participant 2 and Participant 4 highlighting "*initiatives to ensure that accessible drinking water is available,"* along with reminders for everyone to stay hydrated. These actions illustrate a holistic approach to well-being, recognizing that comfort and health are paramount during high heat.

In line with this result, Bordey (2024) reported that the Division of City Schools of Manila has allowed teachers and students to wear comfortable clothes amid the sweltering heat on campuses. According to Division Memorandum No. 123, series of 2024, teachers and students can wear more comfortable clothing aside from their regular uniforms to reduce the heat they feel while inside the schools.

Providing Support and Guidance

Beyond tangible resources, the emotional and professional support offered by school heads is equally vital. Participant 4 noted the importance of *"providing support and guidance to teachers,"* which is further echoed by Participant 15, who mentioned "*helping teachers manage their classes with flexibility.*" Such supportive measures foster an environment where teachers feel empowered to navigate the challenges posed by high temperatures effectively.

Participants 17 and 18 emphasized the significance of "*ensuring the well-being of both students and teachers,*" with Participant 20 sharing strategies during discussions that *"focus on easing extreme heat challenges."* These supportive initiatives not only bolster teacher morale but also promote a culture of collaboration and resilience within the school community.

Additionally, Navarro (2024) addressed those corporations, governments, and individuals must put into practice effective methods to reduce high heat index and prepare for mitigation. The promotion of sustainable practices depends heavily on awareness-raising initiatives and education. Education and awareness-raising campaigns are also crucial in building public support and encouraging sustainable behaviors. Every person has a part to play in the fight against global warming and preserving the environment for coming generations, from cutting back on energy use and supporting climate-friendly legislation to combat high heat index which impacts learning among students.

Supporting Teachers in the Heat: A Community Response

Teaching in extreme heat presents significant challenges for educators, impacting both their ability to deliver effective lessons and the well-being of their students. In light of this, many teachers have turned to their colleagues and the local community for support. This article examines the key themes emerging from responses about how colleagues and the community come together to help teachers manage these extreme conditions.

Sharing Strategies and Resources

One of the most prominent themes identified is the collective effort of colleagues in sharing strategies and resources. Many educators expressed the importance of exchanging ideas on how to manage high heat effectively. Participant 1 emphasized the value of *"sharing techniques for coping with the heat,"* while Participant 2 noted the need for *"heat-friendly lesson ideas and participation in school-wide heat safety planning."* Additionally, Participant 4 mentioned "*collaboration on adjusting schedules and providing useful educational videos or online activities."*

The exchange of practical resources also plays a crucial role in maintaining classroom comfort. For instance, Participant 5 highlighted the practice of *"sharing cooling devices such as fans and even extra water or cooling pads."* This camaraderie not only alleviates the physical discomfort associated with high temperatures but also fosters a sense of community among teachers, as seen in Participant 17's comments about "*collaborative resource sharing*."

To support this theme, students should use large fans connected to generators or nearby power sources to circulate airflow in the classroom. This doesn't cool the air down, but it can provide a refreshing breeze in hot conditions. Airflow can also improve breathing conditions and help teachers and students stay energized. It's important to rest in air-conditioned areas to give time to cool down as the lesson unfolds in a day. (Indeed Editorial Team, 2023)

Providing Emotional and Moral Support

Teaching in extreme heat can take a toll on educators' mental health, and the importance of emotional and moral support from colleagues cannot be overstated. Participant 2 shared that *"offering emotional and*

professional support" is vital for teachers who are struggling under heat stress. This sentiment was echoed by Participant 11, who emphasized the need to "*extend help whenever a colleague feels unwell due to high temperatures."* Participant 18 further illustrated this by discussing the "*physical and mental support that can be provided through collaborative efforts."*

Meanwhile, social and emotional support, according to Jackson (2022) can come from educators, parents, guardians, or other trusted adults. When students feel supported, they are more likely to take risks and try new things. Students who feel supported are also more likely to feel confident in their abilities. This confidence is essential for students as they begin to navigate the world of work. There are many ways that educators can provide social and emotional support to their students.

Adjusting Classroom Environment and Activities

In addition to sharing resources and offering support, many educators have recognized the need to adjust classroom environments and activities to better cope with the heat. Participant 4 reported on the *"collaboration to adjust time schedules"* and modify lesson plans to accommodate the conditions. This adaptability is essential, as noted by Participant 14, who mentioned the "*importance of monitoring students' well-being* "and being flexible with classroom activities. Peer teaching, as suggested by Participant 16, allows teachers to *"take necessary breaks,"* ensuring that both students and educators remain engaged and comfortable.

This theme coincides with the implementation of a memorandum wherein public schools in the city of Manila limited the holding of in-person classes in the morning because of heat index levels. In Memorandum No. 140 s. 2024 dated April 8, Division of City Schools (DCS) Manila Chief Education Supervisor Nerissa Lomeda said in-person classes would only be from 6 a.m. to 12 noon for over six weeks, from April 11 to May 28 in both elementary and secondary schools. Under the scheme, morning and afternoon shifts shall take turns holding in-person classes during this period. (Patinio, 2024)

Practical Assistance

Practical assistance is another critical element in helping teachers manage extreme heat. Many respondents pointed to the sharing of tangible resources as a key form of support. For example, Participant 5 noted that "*sharing extra water and cooling pads"* can make a significant difference in a classroom's comfort level. Participant 13 reinforced this by mentioning the "*donation of cooling devices,"* which can help create a more conducive learning environment. Furthermore, Participant 16 highlighted how *"providing worksheets can keep students occupied,"* allowing teachers to take brief breaks to recharge.

Significantly, schools should play a vital role in providing a cool environment for learning during heatwaves. Well-maintained air conditioning units are ideal, but proper ventilation with fans and open windows can also help. Encourage students to dress appropriately in loose-fitting clothing or light-colored clothing and bring reusable water bottles to stay hydrated throughout the day for heat safety. The local health department discourages hot classrooms from operating. (Chan, 2024)

Community Contributions to Alleviate Heat Impacts

The local community also plays a vital role in alleviating the impacts of high heat on teaching. One major theme is the provision of cooling equipment and resources. Participants reported instances of community members donating electric fans and hydration resources, such as bottled water, to schools. For example, Participant 1 noted that the "*availability of a water source"* was crucial, while Participant 14 mentioned the "*barangay's offering of an air-conditioned evacuation center"* as an alternative learning space during extreme heat. Such contributions underscore the community's commitment to ensuring a supportive environment for educators and students alike.

Another important theme is the adjustment of schedules and activities to promote safety. Participant 16 shared that *"allowing students to arrive early and leave when the sun is less intense"* can significantly reduce their exposure to heat.

The community engagement in heat management also reflects a proactive approach, as highlighted by Participant 2, who mentioned "*initiatives such as organizing public awareness campaigns about heat safety"* and implementing green infrastructure to create cooler environments. This collaborative effort between educators and community stakeholders is crucial in fostering a conducive teaching atmosphere.

Community awareness campaigns help parents and community members understand the benefits of their involvement with their local schools. They also inform community members about the different levels and types of involvement opportunities, policies, and programs. When students feel that they do not belong to a strong community, it can negatively affect their learning experience—and their attendance rates. (Daly, 2024)

Health and Safety Measures

Lastly, health and safety measures have emerged as a critical theme. Providing water rations to communities, as discussed by Participant 6, ensures that both students and teachers remain "*hydrated during extreme conditions."* Moreover, Participant 20 emphasized the importance of "*reminding pupils to bring their water bottles"* and providing them with health education regarding heat safety.

Significantly, heat will reduce working productivity and increase the risk of accidents. It is difficult to complete work or learning in very hot weather and heatwaves may lead schools and other institutions to close. Heatwaves can also be associated with hazardous air pollution events. During the day when outdoor temperatures are higher than indoors, close windows and cover them with blinds or shutters to block direct sunlight. Turn off as many electrical devices as possible. Use electric fans only when temperatures are below 40 ˚C / 104 ˚F. In temperatures above 40 ˚C / 104 ˚F, fans will heat the body. (World Health Organization, 2024)

Coping with High Heat: Support Systems for Teachers

As global temperatures continue to rise, extreme heat has become a significant challenge for educators and students alike. In response, various support systems have been implemented to help teachers manage their responsibilities during these sweltering conditions. The insights gathered from multiple participants highlight key themes that emerge from their experiences, emphasizing the importance of administrative support, cooling resources, adjusted learning methods, community involvement, and practical strategies.

Administrative and Institutional Support

One of the most crucial elements in helping teachers cope with high heat is the support provided by educational institutions. Participant 1 noted that the "*Department of Education took proactive measures by offering alternative workloads*" and encouraging distance learning during particularly intense heat waves. Furthermore, Participant 4 described how "*school administrations ensured that cooling systems were operational,*" coordinated necessary repairs, and permitted more frequent breaks during the hottest hours of the day. The implementation of DepEd Order 007, as mentioned by participant P13, provided *"clear guidelines for canceling or suspending classes due to extreme heat,"* while also promoting flexible learning options like modular distance learning. This approach fosters a collaborative environment where teachers can plan their class schedules effectively, as highlighted by Participant 14, and "*encourages community and parental support for flexible schedules*," as expressed by Participant 15.

Cooling Equipment and Resources

Access to cooling equipment and resources is vital for maintaining a conducive learning environment. Par

ticipants underscored the importance of providing fans, drinking water, and heat safety alerts. Participant 2 emphasized the necessity of "*having accessible cooling equipment,* " while Participant 5 shared practical solutions such as "*using electric fans, staying hydrated, wearing lightweight clothing, and utilizing wet towels to cool down."* The community's response was commendable, with Participant 9 and Participant 19 noted that parents stepped in "*to donate electric fans for classrooms,*" further enhancing the learning atmosphere for students. Ensuring that each classroom is well-ventilated is critical, as Participant 16 advocated for "*more electric fans "* to facilitate a more effective teaching-learning process.

Adjusted Schedules and Learning Methods

To counteract the effects of extreme heat, many educators have adjusted class schedules and adopted alternative learning methods. Participant 2 highlighted the importance of "*rescheduling classes to avoid peak heat hours"* and providing reminders for students to hydrate. In agreement, Participant 11 noted the "*positive impact of shorter school hours and the suspension of face-to-face classes in favor of modular instruction,"* thereby reducing students' exposure to the heat. The flexibility of learning options, including modular distance learning during extreme heat, was reiterated by Participant 13, showcasing the "*adaptability of educational systems in the face of climate challenges."*

Community and Parental Support

Community involvement and parental support are instrumental in fostering a nurturing educational environment during extreme heat. Participant 2 emphasized the need for *"public education on heat safety and prevention,"* which can empower communities to engage in effective heat safety planning. Participant 9 reported that "*parents actively reminded their children to bring water and fans to school,"* demonstrating a collective effort to support students' well-being. The collaborative spirit among educators, as noted by Participant 18, further enhances this *"support network,"* allowing teachers to share strategies and coordinate their responses to high heat effectively.

Practical Measures and Strategies

Lastly, practical measures and strategies have proven beneficial for teachers navigating the challenges posed by extreme heat. Participant 3 suggested providing "*additional water supplies in classrooms and preparing activity sheets*" that minimize physical exertion during hot weather. Similarly, Participant 5 shared the simple yet effective method of "*using wet towels to cool down,*" illustrating the importance of practical solutions in everyday teaching scenarios. The "*exchange of ideas among educators,"* as noted by Participant 20, is vital for developing effective lesson delivery methods during high heat, ensuring that students remain engaged and learning continues uninterrupted.

The themes discussed above on coping with high heat index to support teachers are relevant in the teaching and learning process during unpleasant classroom situations. In times of crisis, Valenzuela (2022) emphasized that taking care of teachers should be of utmost priority for school administrators. They need to rally teachers in ways that don't seem insincere or with an agenda to have them comply. That said, school leaders must consider the best ways of supporting their teachers who are staying in the profession by choice and new colleagues entering a potentially tricky new job situation.

Addressing High Heat Conditions in Educational Environments: Insights and Recommendations

As global temperatures continue to rise, managing high heat conditions in schools has become increasingly critical. Responses from participants provide a wealth of insights into the support measures that could help mitigate the impact of heat on learning environments. These responses have been classified into six primary themes: improved infrastructure and ventilation, cooling equipment and resources, professional

development and education, public education and community engagement, teaching materials and resources, and water supply and hydration.

Improved Infrastructure and Ventilation

A significant number of participants underscored the need for enhanced infrastructure to cope with high heat. Participant 1 suggested the "*construction of temporary learning stations"* with open walls to facilitate air circulation. This idea was echoed by Participant 3, who emphasized the importance of "*good ventilation inside classrooms*." Meanwhile, Partici[pant 13 called for a "*comprehensive improvement in classroom infrastructure*," advocating for natural ventilation, insulation, and air conditioning to create a more conducive learning atmosphere. Participants 18 and Participant 20 further highlighted the "*necessity for new classrooms designed with proper ventilation and insulated walls and ceilings*" to maintain cooler temperatures. Such infrastructural improvements not only promise immediate relief from heat but also contribute to a more effective learning environment for students.

Cooling Equipment and Resources

The second theme that emerged from the discussions was the urgent need for cooling equipment and resources. Participant 2 suggested "*modernizing existing air conditioning systems"* and enhancing airflow with additional features like awnings and canopies. Participant 6 and Participant 14 both advocated for the "*provision of extra sturdy electric fans*," while Participant 9 insisted that "*equipping all classrooms with air conditioning should be a priority*." Moreover, Participant 11 highlighted the "*necessity of ensuring a constant supply of safe and clean drinking water*" alongside air conditioning facilities. Other participants, such as Participant 15, proposed the "*donation of solar fans and generators to bolster cooling efforts*." Participant 20 also stressed the importance of "*providing access to cold water,"* which is vital for maintaining student hydration and well-being.

Professional Development and Education

Another critical area identified was the need for professional development focused on heat-related health and safety. Participant 4 emphasized the importance of *"training teachers to recognize the signs of heat exhaustion and to implement first aid measures effectively*." This training would also include strategies for modifying teaching methods during extreme heat conditions. Participant 5 highlighted the "*need to educate children on how to stay cool,*" thus empowering them with the knowledge to manage their well-being in high temperatures. Participant 17 encapsulated the importance of a "*holistic approach*," suggesting that preventive measures, infrastructure support, and public education should be combined to effectively manage high heat conditions.

Public Education and Community Engagement

Public education and community engagement were also seen as vital components in addressing heat-related challenges. Participant 2 recommended, "*integrating heat safety into lesson plans and organizing public education initiatives to raise awareness."* This could include providing heat safety alerts and hydration reminders, ensuring that both students and the broader community are well-informed about the risks associated with high temperatures. Participant 17 reiterated the necessity for public education, "*underscoring that a well-informed community is better equipped to cope with heat-related challenges."*

Teaching Materials and Resources

Efforts to enhance teaching materials and resources were also noted as a significant area for improvement. Participant 16 suggested "*providing ready and equipped teaching materials*" to minimize the time teachers spend on classroom preparations. This would not only allow teachers to focus more on effective teaching

practices but also create a more dynamic learning environment, which is essential during periods of high heat.

Water Supply and Hydration

Finally, ensuring access to safe and clean drinking water emerged as a crucial theme. Participant 11 and Participant 19 both emphasized the importance of "*a potable water supply"* within school premises, while Participant 20 reiterated that "*students must have access to cold water to stay hydrated."* Given that dehydration can severely affect concentration and learning, these measures are critical for safeguarding student health.

Interestingly, the six themes elaborated above conform with Bordey's (2024) reporting that the Division of City Schools of Manila has allowed teachers and students to wear comfortable clothes amid the sweltering heat on campuses. According to Division Memorandum No. 123, series of 2024, teachers and students can wear more comfortable clothing aside from their regular uniforms to reduce the heat they feel while inside the schools.

In the same manner, Cabico (2023) attested that the Department of Health (DOH) reminded teachers and students about the impacts of summer heat on their health as well as the conduct of classroom learning. In a briefing, Health officer-in-charge Maria Rosario Vergeire urged parents and students to remind children to drink water often, make children wear light clothes so they are comfortable, do not go or play outside when sunlight is intense, and always bring an umbrella. She also reminded teachers and school personnel to open windows and doors of classrooms and turn on fans during classes.

The Toll of High Heat Conditions on Teachers' Physical Health

In the realm of education, the environment in which teaching occurs plays a crucial role in the well-being and performance of educators. A growing body of evidence suggests that high heat conditions significantly affect teachers' physical health, impacting their ability to deliver lessons effectively and maintain their overall quality of life. Through a series of participant narratives, five distinct themes emerge, revealing the multifaceted challenges teachers face when subjected to extreme heat.

Exhaustion and Fatigue

One of the most immediate and evident impacts of high heat conditions is exhaustion and fatigue. Participants frequently expressed feelings of being drained after a day of teaching. Participant 1 remarked that *"teaching in high heat conditions is energy-consuming, exhausting, and mentally and physically draining."* Similarly, Participant 5 noted that the "*intense heat made them tire more quickly,"* often leading to dehydration and resultant headaches. This sentiment was echoed by Participant 9, who mentioned "*feeling exhausted by the day's end."* The cumulative effect of heat exhaustion is not merely physical; Participant 18 described experiencing "*dizziness and sudden mood changes,"* suggesting a significant mental toll. Furthermore, Participant 20 articulated a "*state of burnout attributed directly to heat exhaustion and dehydration,*" highlighting the pervasive and insidious nature of the issue.

Dehydration and Related Symptoms

Dehydration emerges as another critical theme that teachers grapple with under high heat conditions. Participant 2 vividly described the "*array of symptoms experienced due to insufficient hydration,"* including dizziness, nausea, rapid heartbeat, and muscle spasms from electrolyte imbalance. This condition is not merely a discomfort; it poses serious health risks. Participant 5 reiterated the "*connection between dehydration and headaches*," while Participant 11 shared experiences of "*irritability and tiredness"* triggered by excessive heat. Participant 16 underscored the necessity of "*frequent water breaks*

to combat fainting and dizziness," further emphasizing the profound impact of hydration on a teacher's ability to concentrate and perform effectively.

Heat-Related Illnesses

The risk of heat-related illnesses is a pressing concern for educators working in high temperatures. Participant 2 warned of the" *dangers of heat exhaustion and heat stroke*," conditions that can have severe health implications. Participant 4 elaborated on the "*increased body temperature's repercussions,* "leading to muscle fatigue, joint pain, and a heightened risk of injury. Furthermore, Participant 7 noted how the high heat index could exacerbate "*hypertension and respiratory issues.*" For Participant 15, high temperatures worsened "*pre-existing asthma,"* affecting their capacity to fulfill their teaching duties. These narratives highlight the urgent need for awareness and strategies to mitigate the risks associated with heat exposure in educational settings.

Stress and Anxiety

The psychological impact of high heat conditions on teachers cannot be overlooked. Participant 13 expressed "*frustration over the adverse classroom environment"* and the associated health concerns, indicating a link between physical discomfort and mental well-being. Participant 14 shared that high heat conditions contributed to "*headaches and migraines*," as well as increased stress and anxiety levels. Such stressors can diminish teachers' overall job satisfaction and effectiveness, creating a cycle of discomfort that can impact both their personal lives and professional responsibilities.

Professional Resilience and Adaptation

Despite the numerous challenges posed by high heat conditions, many teachers exhibit remarkable resilience and adaptability. Participant 3 acknowledged that "*health issues related to heat directly affect lesson delivery and classroom performance.*" Nonetheless, Participant 17 highlighted the "*determination of teachers to find ways to stay comfortable and continue their teaching responsibilities",* showcasing a spirit of perseverance. Participant 19 encapsulated this notion, "*stating that teaching in high-heat conditions, while challenging, is simply part of daily professional life."* This adaptability reflects the commitment of educators to their vocation, even in the face of adverse conditions.

Accordingly, heat-related problems brought about by high heat conditions occur through several pathways: A major rise in body temperature, due to a build-up of heat, leads to conditions such as heat exhaustion, and eventually heat stroke, which is a medical emergency. Also, the redirection of blood flow to the skin, means that the heart must work harder than normal. The strain on the heart can cause problems for people with existing heart conditions. Likewise, an increase in sweating can lead to dehydration if fluid loss is not replaced by drinking enough. Finally, dehydration can cause weakness and fainting, lead to kidney problems, and worsen other medical conditions. (Better Health, 2024)

Similarly, Dogan (2024) pointed out that the health effects of extreme heat include dizziness, fainting, sleep disruption, breathing difficulties, heat exhaustion, heart attacks and kidney damage. In severe cases, extreme heat can lead to heatstroke (when the body temperature rises above 40°C), organ failure, and even death. There are also indirect health impacts of extreme heat – including an increased risk of accidents, exposure to air pollution, food insecurity, and the rising spread of some infectious diseases.

V. The Impact of High Heat on Teachers' Emotional Well-Being and Resilience

As global temperatures rise, many teachers find themselves grappling with the effects of extreme heat on their emotional well-being and resilience in the classroom. The experiences of educators reveal a range of

emotional responses and coping strategies, showcasing both the challenges posed by high heat and the resilience developed through these trials.

Irritability and Frustration

The emotional toll of high heat is evident in the experiences shared by several educators. Participant 1 expressed how high temperatures lead to "*feelings of irritability and discomfort, draining their emotional reserves.*" Similarly, Participant 4 notes that discomfort manifests through physical symptoms like "*excessive sweating and fatigue,"* resulting in heightened irritability and frustration. For many, including Participant 5 and Participant 6, the combination of fatigue and the struggle to concentrate exacerbates "*feelings of annoyance*," making it challenging to maintain a positive classroom environment.

Participant 9 highlighted how high heat makes them "*impatient, particularly when addressing student discipline,*" indicating a direct impact on their interactions with pupils. Participant 13 added that the physical discomfort stemming from severe heat can trigger "*stress, anxiety, and mental strain, contributing to a pervasive sense of unease among educators."*

Stress and Anxiety

The emotional landscape becomes even more complex when educators discuss the anxiety and stress associated with high heat. Participant 2 described "*feeling overwhelmed by heat-related challenges, which include worries about student safety and academic performance."* This multifaceted anxiety can lead to mood swings, decreased patience, and an overall sense of emotional exhaustion. The experiences shared by Participant 11 echoed this sentiment, as mood changes "*disrupt their ability to concentrate and affect their sleep."*

Moreover, for those with pre-existing conditions like asthma, as articulated by Participant 15, high heat not only contributes to anxiety but can also lead to "*feelings of hopelessness.*" Participant 17 underscored that "*extreme temperatures impact overall emotional well-being, creating a cycle of anxiety and irritability that is difficult to break."*

Coping and Resilience

Despite these challenges, many educators demonstrated remarkable resilience and adaptability in the face of high heat. Participant 3 shared their strategy of *staying calm and avoiding activities that could exacerbate discomfort,* while Participant 16 noted that their passion for teaching helps them "*maintain a positive outlook, despite overthinking the situation."* This highlights a key aspect of resilience: the ability to focus on what matters most—students and their learning experiences.

Participant 18 articulated a profound realization: the challenges posed by "*high heat have strengthened their passion for teaching,"* which serves as a buffer against emotional turmoil. Meanwhile, Participant 19 emphasizes their "*determination to prevent high heat from affecting their emotional well-being, showcasing an unwavering commitment to their role as an educator."*

Adaptability and Flexibility

The experiences shared by educators not only reflect the emotional impact of high heat but also illustrate how these challenges foster adaptability and flexibility. Participant 1 notes that "*high-heat challenges broaden resilience,* "emphasizing the importance of teachers' responsibilities. Participant 4 affirmed that "*dealing with extreme temperatures requires quick adjustments to teaching methods and classroom environments,*" reinforcing the necessity for educators to remain adaptable.

Participant 9 described how encounters with "*high heat have cultivated flexibility and durability in their teaching approach.*" This sentiment is echoed by Participant 16, who mentioned that "*adapting to different temperatures and managing emotions are vital skills developed through these experiences."*

Problem-Solving and Resourcefulness

The challenges posed by high heat have also encouraged teachers to cultivate problem-solving skills and resourcefulness. Participant 2 highlighted the importance of "*self-care, support networks, and reflective practices in building resilience.*" Similarly, Participant 3 and Participant 5 emphasized the need to "*stay calm and focus on solutions during lessons*," illustrating a proactive approach to problem-solving.

Participant 15 shared that "*becoming comfortable with unexpected changes has led to creative problem-solving and adaptability."* The support from colleagues, as noted by Participant 18 (P18), played a crucial role in fostering resourcefulness and effectiveness in high-heat situations.

In line with the above themes presented, the study of Preña & Labayo (2024) asserted that the exceptionally high temperatures and humidity across almost all parts of the Philippines have created extremely uncomfortable conditions, particularly for teachers and students at all education levels. Beyond discomfort, heat stress can also harm their health, impair their well-being, and reduce productivity.

Colie & Martin (2016) noted that effective instruction requires adaptation of instructional content and lesson pacing to be responsive to students' differentiated learning needs, changes in the levels of learning support provided to students as they develop expertise in the content, and modification of classroom management strategies to respond to the changing classroom environment. In addition, working in schools require that teachers can successfully respond to and deal with any changing demands that transpire across the school more broadly. As such, adaptability is a capacity that is of central relevance to teachers' healthy and effective functioning at work.

Exploring the Long-Term Effects of Teaching in High Heat: Insights from Educators

Teaching is a profession that demands not only intellectual rigor but also emotional and physical endurance. As climate change contributes to rising temperatures, many educators find themselves navigating the challenges of teaching in high heat. Recent insights from a group of teachers have highlighted several long-term effects of this experience, categorized into key themes: increased resilience and adaptability, physical and mental health impacts, career development and job satisfaction, professional practice and teaching methods, and mixed or no long-term effects.

Increased Resilience and Adaptability

A notable theme that emerged from the discussions was the enhanced resilience and adaptability that teachers developed due to working in high heat. Participant 1 reflected, *"High heat has made me more resilient and provided experiences and knowledge useful for the future."* This sentiment was echoed by Participant 18, who stated that "*the challenges posed by high temperatures have not only increased their preparedness for future obstacles but also fueled a deeper passion for teaching."* Similarly, Participant 20 emphasized "*the personal strategies they developed to cope with the heat",* which has also contributed to their growth as educators. This theme underscores the potential for adversity to foster growth and adaptation in professional contexts.

Physical and Mental Health Impact

Conversely, the physical and mental health ramifications of teaching in high heat were prominently discussed among participants. Participant 4 voiced a common concern, noting that *"constantly working in a hot environment takes a toll on physical stamina, leading to fatigue and decreased energy over time."* This fatigue was corroborated by Participant 5, who articulated how high heat can lead to "*diminished concentration, increased stress levels, and ultimately, a negative impact on teaching effectiveness*." Participant 11 shared similar experiences of "*weakness and stress stemming from prolonged exposure to heat,*" while P13 cautioned that such conditions could precipitate chronic health issues. Furthermore, P17

highlighted the more "*severe consequences of heat exposure, including dehydration and heat exhaustion,"* which not only affect health but also impair task performance. This theme paints a troubling picture of the challenges teachers face beyond their instructional responsibilities.

Career Development and Job Satisfaction

The impact of high heat on career development and job satisfaction was another critical theme. Participant P2 discussed the potential for burnout and turnover, indicating that high heat conditions could reduce job satisfaction and strain relationships among staff. They also noted how these factors lead to decreased collaboration, difficulties in mentoring, modified teaching styles, reduced creativity, and a greater reliance on technology. This suggests that the environment in which teachers work directly influences their professional dynamics and overall satisfaction with their roles.

Professional Practice and Teaching Methods

Teachers also shared insights into how their professional practices and teaching methods adapted in response to high heat. Participant 3 described the necessity of "*adjusting lessons to maintain a conducive classroom atmosphere*," emphasizing the importance of environmental factors in learning. However, Participant 16 expressed a contrasting view, suggesting that "*there were no significant long-term effects,"* indicating a balance in the teaching-learning process that allowed for effective delivery despite heat challenges. Moreover, Participant 17 recommended that "*schools consider infrastructural improvements, such as better ventilation and air conditioning, to enhance the learning environment.*" This theme illustrates the diverse strategies educators employ to navigate the complexities of teaching in less-than-ideal conditions.

Mixed or No Long-Term Effects

Finally, some participants reported mixed or no significant long-term effects from teaching in high heat. Participant 6 maintained that they found ways to effectively deliver lessons despite the challenges, asserting that "*adaptability remains a core competency in education.*" Similarly, Participant 19 echoed this sentiment, indicating that "*they had not experienced long-term consequences due to the heat."* These responses suggest a level of optimism and resilience within the teaching community, where many educators feel equipped to handle the challenges presented by their environments.

Coping with the Heat: How Teachers Navigate High-Temperature Classrooms

Teaching in high-heat conditions presents unique challenges for educators. However, many teachers have developed effective coping mechanisms that allow them to thrive in such demanding environments. Through a thematic analysis of responses from various participants, we uncover the strategies that help teachers maintain their well-being and ensure an effective learning atmosphere for their students. The responses reveal five primary themes: flexibility and creativity, emotional coping mechanisms, practical coping mechanisms, physical coping mechanisms, and community and support networks.

Flexibility and Creativity

Teachers have demonstrated remarkable adaptability in their approaches to lesson planning and classroom management. For instance, Participant 1 emphasized the importance of "*developing a sense of flexibility and creativity when crafting lessons,"* making it possible to respond to the challenges of varying seasons. Similarly, Participant 18 noted the "*necessity of being both physically and mentally prepared"* to face the unpredictable hurdles that arise from extreme heat. These narratives underscore the innovative spirit educators employ to enhance their teaching and connect with students, regardless of external conditions.

Emotional Coping Mechanisms

The emotional resilience of teachers plays a crucial role in their ability to cope with high temperatures. Participant 2 highlighted the importance of "*mindfulness, self-compassion, and emotional regulation,"* along with the support of a robust network of colleagues and friends. This perspective is echoed by Participant 4, who remained" *focused on the temporary nature of heat-related challenges,'* reminding themselves that they can be overcome. Additionally, Participant 15 shared the benefits of maintaining a light-hearted attitude and fostering positivity, which can be instrumental in reducing stress. Participant 16 further added that *"taking moments to relax, such as watching the sunset or practicing breathing exercises,"* can serve as effective emotional coping strategies.

Practical Coping Mechanisms

Practical strategies form the backbone of how teachers navigate high-heat conditions in the classroom. As Participant 2 explained*, "adaptations in lesson planning, implementing heat-friendly teaching strategies, and ensuring proper hydration*" are essential for maintaining productivity. Participant 3's approach includes "*regular breaks and increased water intake"* while Participant 5 emphasized "*wearing light, breathable clothing and using fans"* to create a more comfortable environment. Other participants, like Participant 14, had "*adjusted their teaching schedules to avoid peak heat hours, demonstrating a proactive approach*" to managing classroom conditions. This collective emphasis on practical coping mechanisms illustrates the multifaceted strategies teachers utilize to ensure both their and their students' comfort and engagement.

Physical Coping Mechanisms

Physical health is critical for teachers facing heat stress. Participant 2 identified various "*self-care practices, including regular exercise, healthy eating, and sleep management."* Additionally, Participant 13 mentioned the necessity of "*protective measures like sunscreen and sunglasses to guard against sun exposure.*" These physical coping mechanisms not only help teachers maintain their well-being but also set an example for students about the importance of self-care, especially in challenging environments.

Community and Support Networks

Finally, the role of community and support networks cannot be overstated. Participant 19 emphasized the importance of "*creating a conducive teaching environment"* by reaching out for help from parents, community members, and other stakeholders. Such collaborative efforts can ease the burdens teachers face during high heat conditions and foster a sense of solidarity. The support of these networks can enhance the coping mechanisms employed by educators, leading to a more resilient and resourceful teaching community.

To support the themes presented, Li's (2023) study revealed that teacher self-efficacy and resilience exhibited direct and negative associations with teacher burnout. Additionally, an interesting finding emerged where teacher emotion regulation indirectly affected teacher burnout, mediated by teacher resilience. Moreover, the negative connections between teacher self-efficacy, resilience, and burnout highlight the importance of nurturing these factors to mitigate burnout risk. These outcomes collectively contribute to the understanding of teacher dynamics and suggest potential avenues for targeted interventions.

Furthermore, Barnová et al. (2023) study confirmed the existence of associations between teacher resilience and years of teaching experience as novice teachers and teachers with ten or fewer years of teaching experience achieved lower scores on the scale than their more experienced colleagues. The findings suggest that years of teaching experience can be considered an important variable from the aspect

of teacher resilience and it is important to pay increased attention, especially to novice teachers' well-being and building their resilience by guiding them through developing effective coping strategies.

VI. Mitigating High Heat in Classrooms: Practical Steps by Teachers

As temperatures rise, the challenge of maintaining a comfortable and conducive learning environment becomes increasingly pressing for educators. High heat can significantly impact students' concentration, engagement, and overall well-being. Based on responses from various teachers, several effective strategies have emerged to combat the effects of excessive heat in classrooms. This article explores these themes, illustrating the practical steps taken by educators to ensure a more pleasant educational experience.

Ensuring Proper Ventilation and Airflow

One of the most frequently cited strategies for reducing classroom heat is ensuring proper ventilation and airflow. Teacher Participant 1 highlighted the importance of "*using fans to promote airflow,"* while Participant 4 emphasized "*keeping windows open and adjusting classroom layouts"* to minimize direct sunlight. Many educators, including Participant 5 and Participant 6, advocate for the "*use of both natural and mechanical means"* to ensure that the air in the classroom remains fresh and circulating. Participant 20 even suggested "*requesting additional electric fans to enhance cooling*." By prioritizing ventilation, teachers aim to create an atmosphere that is less stifling and more conducive to learning.

Meanwhile, heat exhaustion symptoms include nausea, vomiting, sometimes headaches, and sweating. On heat stroke, people do not perspire they will have a high temperature above 40 degrees and they will experience central nervous system disturbances like delirium seizures, a person can pass out. Heat stroke is an emergency case, and when people experience heat exhaustion, they have already addressed it.) She advised people to hydrate by drinking 2-3 liters of water a day, avoid too much exposure to the sun, wear loose clothing, and know the signs and symptoms of heat stroke. (Sun Star Davao Digital, 2024)

Hydration and Water Access

Hydration emerges as another critical theme in the responses. Teacher Participant 1 noted the necessity of "*providing accessible water stations and encouraging regular water breaks".* Similarly, Participant 5 and Participant 14 stressed the importance of "*reminding students to stay hydrated,*" while Participant 19 "*advises allowing students to drink water regularly*," regardless of their thirst. P20 takes it a step further by requiring students to bring water bottles to class. This emphasis on hydration serves to maintain students' energy levels and focus, especially during hotter months.

Classroom Modifications

Classroom modifications are essential for creating a more comfortable environment. Teacher Participant 2 suggested "*pre-heat preparations, such as air-conditioning maintenance and thermal insulation,"* alongside lighting adjustments and window treatments. Participant 4 mentioned the need to "*adjust the classroom layout to create more space between desks,"* while Participant 9 highlighted the simple yet effective tactic of "*turning off lights to reduce heat*." Such modifications not only improve comfort but also foster a more focused learning atmosphere.

Accordingly, modifications involve making substantive adjustments to the curriculum itself, including teaching methods, materials, and assessments, to align with individual student's strengths and challenges. These changes ensure all students can learn in a way that works best for them, promoting a more inclusive and supportive learning environment. (Voyager Sopris Learning, 2024).

Teaching Strategies and Scheduling

In light of high temperatures, teachers have also adapted their teaching strategies and scheduling practices. Flexible scheduling is advocated by Participant 2, who recommended "*incorporating online instruction*

and heat-friendly activities." Participant 3 emphasized the importance of *"longer breaks and proper seat spacing*" to give students the necessary time to cool down. Participant 17 further advised "l*imiting outdoor activities during peak heat hours and utilizing shaded areas when outdoor learning is unavoidable."* These strategies are designed to help maintain student engagement while prioritizing their health and comfort.

In essence, teachers should identify which teaching methods will properly support a particular learning outcome. Its effectiveness depends on this alignment. To make the most appropriate choice, teachers should consider learning outcomes, student needs, and the learning environment. Choosing the appropriate teaching method brings instruction to life while encouraging students to actively engage with content and develop their knowledge and skills. (University at Buffalo, 2024)

Positive Environment and Attitude

Creating a positive environment is fundamental to fostering an effective learning atmosphere, especially during challenging weather conditions. Participant 16 encapsulates this sentiment by entering the classroom with a *"positive mind, clean heart, and a smile."* This optimistic approach not only uplifts the mood of the classroom but also helps to mitigate stress and anxiety that may arise from the discomfort of high heat.

Additionally, Verma (2019) stressed that teachers should strive to create an environment that is more conducive to engagement and learning. A classroom environment that is not positive and full of restrictions and rigid rules impairs learning by narrowing a student's focus and inhibiting his/her ability to explore multiple viewpoints and solve problems. A positive classroom environment helps improve attention, reduce anxiety, and support the emotional and behavioral regulation of students. When educators foster a positive learning culture; learners are more likely to acquire higher motivation which leads to wonderful learning outcomes. Schools can potentially lift student achievement by improving their learning environments.

Preparing Materials and Resources

Finally, preparation plays a vital role in managing classroom heat. Participant 18 emphasized the importance of "*preparing necessary materials ahead of time to minimize disruption*" and ensuring that students can remain focused on learning. This forward-thinking approach allows educators to dedicate more time to teaching rather than scrambling to gather resources in an uncomfortable environment.

Similarly, planning ensures that lessons run on time, all the materials teachers need are on hand, and that students are guided on what they need to do. All this helps to free up moments throughout the day for teachers to stop and think. In this manner, teachers can assess how the lesson is going, how students are coping, and whether any tweaks need to be made. (User Friendly Resources, 2022)

Keeping Students Engaged in Learning Despite the Heat: Strategies from Educators

As temperatures rise, teachers face the challenge of maintaining student engagement in the classroom. With the sweltering heat affecting concentration and comfort, educators have developed a variety of strategies to ensure that learning continues effectively. Through analyzing teacher responses, we can classify their strategies into several key themes: creating a comfortable learning environment, adjusting lessons and activities, encouraging hydration and breaks, using positive reinforcement and motivation, and employing interactive methods.

Creating a Comfortable Learning Environment

A primary concern among teachers is the physical comfort of their students. Participant 1 emphasized that ensuring "*student engagement is a top priority,"* regardless of external temperatures. Educators like

Participant 4 and Participant 5 advocated for modifying teaching methods to make the learning environment as comfortable as possible. This includes fostering interaction and hands-on activities that can alleviate some discomfort. Proper ventilation is highlighted as essential, with Participant 14 and Participant 19 mentioned the importance of "*shades and cooling systems, such as electric fans",* to create a more pleasant atmosphere for learning. These adaptations help mitigate the distractions caused by heat, allowing students to focus on their lessons.

Notably, Hawthorne (2022) discussed that teachers must create a physical environment that allows all pupils to feel content, comfortable, and focused. This means consideration of light, noise, air quality, temperature, reflections, and wall colors. For instance, there should be good natural light in classrooms, and quality electrical lighting. Ideally, there should be no glare from direct sunlight, blinds should be effective and the whiteboard projection should be easy to see. An organized and clutter-free space can help students to be more attentive and more engaged with their learning even during high heat conditions.

Adjusting Lessons and Activities

To combat the effects of heat on concentration, teachers are increasingly adjusting their lesson plans. According to Participant 2, "*breaking lessons into shorter segments and utilizing digital platforms"* can engage students without overwhelming them. Educators are encouraged to incorporate self-paced interactive projects, group discussions, and educational games that can transform the classroom experience. Participant 3 noted that providing "*one straightforward activity can help maintain focus,*" while Participant 7 suggested "*assigning less stressful tasks with short, achievable objectives."* Teachers like Participant 11 and Participant 20 advocated for the "*use of technology,"* such as educational apps and online quizzes, to keep students engaged without requiring extensive physical activity.

Also, a positive learning environment allows the child to develop a sense of belonging, trust others, and feel encouraged to tackle challenges, take risks, and ask questions. There are three main aspects to be considered in the creation of a positive learning environment; these are the physical environment, emotional environment, and respectful and supportive environment. A positive emotional environment, on the other hand, is a welcoming atmosphere that is devoid of stress. By ensuring a stress-free environment, the learner will feel safe and confident to share their opinions and thoughts. (The Global Scholars, 2021)

Encouraging Hydration and Breaks

Recognizing that hydration is vital for maintaining student focus, many educators prioritize providing accessible water stations and encouraging regular breaks. Participant 1 mentioned the importance of "*hydration breaks",* which Participant 5 supported by suggesting "*short intervals for students to refresh themselves."* Similarly, Participant 17 emphasized the necessity of "*frequent breaks and wearing light clothing"* to cope with high temperatures. These hydration strategies not only help students feel more comfortable but also enhance their ability to concentrate on learning tasks.

Positive Reinforcement and Motivation

Maintaining a positive mindset is crucial for both teachers and students during hot weather. Participant 6 highlights the importance of "e*ncouraging patience and reminding students that their discomfort is temporary*." "*Using positive reinforcement and mindfulness techniques*," as noted by Participant 17, can help maintain student focus even in challenging conditions. Participant 18 reinforces the need for "*preparedness in lesson planning,"* ensuring that interventions are in place to address any issues that arise due to the heat. These strategies foster resilience and motivation among students, promoting a conducive learning environment.

In connection to this, Ismail's (2023) study affirmed that one of the most effective teaching methods is positive reinforcement. The results of his study have shown that positive reinforcement increases student engagement in the classroom.

Interactive and Engaging Methods

Finally, the use of interactive and engaging teaching methods stands out as a prevalent theme. Participant 2 advocated for "*incorporating real-world applications*," providing students with choices, and integrating classroom discussions to enrich the learning experience. Participant 13 and Participant 17 also emphasized the "*effectiveness of group work and interactive activities,"* which can create a more dynamic and engaging classroom atmosphere. By adjusting the pace of lessons and incorporating hands-on learning, teachers can capture student interest and enthusiasm, even when the weather outside is less than inviting. Significantly, Blyznyuk & Kachak (2024) underscored that interactive learning often involves problem-solving activities, which foster students to apply critical thinking skills to analyze information, evaluate results, and solve educational problems. Through hands-on experiences and real-world scenarios, students develop the ability to think critically and make informed decisions. Such active engagement encourages students to process information deeper, leading to better understanding and retention of concepts. Interaction in the learning process frequently involves collaborative activities that encourage students to work together and share ideas.

Innovative Solutions to Combat High Heat in Classrooms: A Collaborative Effort

As temperatures soar during the warmer months, the issue of high heat in classrooms becomes increasingly pressing. Teachers have been at the forefront of addressing this challenge, implementing a variety of innovative solutions to ensure their students remain comfortable and focused during lessons. A recent survey of educators provided valuable insights into the strategies that have been adopted. Here, we explore these strategies, classified into five prominent themes: Hydration and Water Breaks, Cooling Systems and Ventilation, Classroom Modifications and Design, Scheduling and Activity Adjustments, and Community and Local Government Support.

Hydration and Water Breaks

One of the most straightforward yet effective measures taken by teachers involves encouraging regular hydration among students. For instance, Participant 1 emphasized the importance of "*frequent water breaks and suggested offering cold snacks"* to keep students cool. Similarly, Participant 5 echoed this sentiment, advocating for "*regular intervals of drinking water."* Participant 14 encouraged learners to "*bring tumblers filled with water*," promoting a culture of hydration. Moreover, Participant 20 highlighted the necessity of allowing students to "*keep water bottles at their desks,"* thereby reminding them to drink throughout the lesson. These practices reflect a growing awareness of the critical role that hydration plays in maintaining concentration and preventing heat-related discomfort.

Cooling Systems and Ventilation

Another essential theme emerged around enhancing the physical environment of classrooms. Participant 2 reported the successful "i*mplementation of portable evaporative coolers, misting systems, and solar-powered ventilation."* These technologies not only cool the air but also contribute to energy efficiency. To complement these systems, Participant 5 suggested "*placing portable fans around the classroom*" to improve air circulation. Participant 11 emphasized the need for "*proper ventilation and a consistent supply of clean water,*" underscoring the interconnectedness of hydration and environmental comfort. Participant 17 took it a step further, recommending "*energy-efficient cooling systems and the use of natural ventilation strategies"* such as strategically placed windows and shades to optimize airflow.

Classroom Modifications and Design

Classroom design also plays a pivotal role in managing heat levels. Participant 1 shared insights on "*arranging seating for comfort*," ensuring that students are not cramped and have adequate personal space. Participant 4 introduced "*mindfulness techniques, including breathing exercises and meditation,*" to help students remain cool and focused amidst the heat. The *use of indoor plants* was highlighted by Participant 5 as a natural way to cool the air and enhance the learning environment. Participant 16 advocated for "*utilizing open, shaded areas for learning, and promoting outdoor lessons when possible."* These modifications illustrate a holistic approach to creating a conducive learning atmosphere that mitigates the discomfort caused by high temperatures.

Notably, Oruikor et al., (2023) proved that classroom design is a critical element in creating an effective learning environment. Classroom design should be intentional and purposeful, incorporating elements such as natural light, flexible spaces, comfortable furniture, strategic use of color, and technology that supports learning.

Scheduling and Activity Adjustments

Recognizing the impact of timing on student comfort, Participant 18 suggested "*adjusting class schedules"* to start earlier in the day when temperatures are more bearable. This proactive approach not only helps students engage better with their lessons but also minimizes their exposure to the peak heat of the day. Such adjustments demonstrate the flexibility and adaptability of teachers in responding to environmental challenges.

Community and Local Government Support

Finally, community engagement has emerged as a crucial component in combating high heat in classrooms. Participant 2 emphasized the importance of *involving the community in funding projects aimed at enhancing classroom environments."* Additionally, Participant 6 highlighted the "*collaboration with local government initiatives"* that encourage hourly water breaks, reinforcing the message of hydration on a broader scale. These partnerships underscore the collective responsibility of educators, local authorities, and communities in addressing the challenges posed by high heat.

Interestingly Friday (2023) shared that another way that community involvement can be promoted is by encouraging volunteerism. Volunteers play a crucial role in supporting schools, especially in low-income areas, where resources are limited. Volunteers can provide additional teaching support, mentorship, and after-school programs, leading to improved academic performance and better student outcomes.

The Role of Technology in Helping Teachers Manage High Heat Conditions

As classrooms around the world face increasingly high heat conditions due to climate change and urbanization, educators are exploring innovative solutions to ensure effective learning environments. A recent study examined how technology assists teachers in managing these challenges, categorizing responses from participants into four distinct themes: enhancing learning and engagement, cooling and ventilation solutions, weather monitoring and planning, and creating a comfortable learning environment.

Enhancing Learning and Engagement

One of the most significant benefits of technology is its ability to enhance learning experiences while reducing physical exertion. Participant 1 emphasized that "*technology simplifies lesson presentation,"* ultimately reducing both effort and time. This sentiment was echoed by several others, including Participant 2, who noted the effectiveness of "*virtual learning environments, online classes, and digital simulations in engaging students while minimizing their physical involvement."* This is particularly vital during high-heat days when traditional learning may be disrupted.

For instance, Participant 4 highlighted the use of "*educational apps and online resources"* that keep students engaged without requiring extensive physical activity, such as digital lessons or video presentations. This not only helps maintain student focus—an observation made by Participant 16, who remarked that "*video presentations keep pupils attentive and less mobile*"—but also ensures that learning continues uninterrupted, as stated by Participant 20, who mentioned, "*interactive educational tools that facilitate digital lesson delivery*." Overall, technology plays a critical role in maintaining engagement, especially during oppressive heat conditions.

Meaningfully, not only does student engagement make teaching itself more fun, engaging, and rewarding, but it has been shown to have critical impacts on students. When students display high levels of behavioral, emotional, and cognitive engagement, they are more likely to excel academically, form a stronger sense of connection with their school, and have a more positive sense of social-emotional well-being. (Sutton, 2021)

Cooling and Ventilation Solutions

In addressing the physical discomfort brought on by high temperatures, participants noted the necessity of effective cooling and ventilation solutions. Participant 5 pointed out "*the use of air conditioning and fans*" as essential components in creating a more bearable classroom environment. Participant 6 added that "*electric fans and water dispensers are critical for alleviating heat stress,"* while Participant 7 called for *engineers to "design classrooms with better insulation and architectural features"* tailored to high heat management.

Furthermore, Participant 14 discussed the "*role of early warning systems and weather monitoring tools"* that not only provide forecasts but also allow for better planning and preparation in schools during heat waves. These technological innovations can significantly enhance the comfort and functionality of learning environments, especially when extreme weather events strike.

To back up this theme, studies have shown that it can also improve pupils' concentration, cognitive performance, and productivity – in addition to reducing a range of respiratory symptoms. Schools with better-ventilated classrooms have even been shown to have higher test scores. (University of Leeds, 2022)

Weather Monitoring and Planning

Participants also highlighted the importance of technology in weather monitoring and planning, which is vital for ensuring student safety. Participant 5 noted that "*weather apps provide valuable forecasts,"* allowing educators to monitor conditions and plan outdoor activities accordingly. Participant 13 elaborated on the benefits of "*real-time weather monitoring systems,"* which help schools anticipate heat waves and implement necessary precautions.

Additionally, Participant 18 mentioned that "*technology serves as a crucial communication tool*," allowing teachers to inform students who cannot attend school and monitor weather conditions for timely interventions. Participant 19 emphasized that "*technology aids in spreading awareness about extreme heat"* and in developing effective strategies for managing its impact. This proactive approach is essential for safeguarding the well-being of students and staff alike.

Remarkably, heat stress is an increasingly significant occupational hazard, especially in the context of climate change. With temperatures rising globally, workers in various industries face heightened risks to their health and productivity. Effective environment monitoring systems can play a crucial role in preventing heat-related illnesses, meeting OSHA compliance, and maintaining safe working conditions. (Room Alert, 2020)

Creating a Comfortable Learning Environment

The final theme that emerged from the participants' discussions was the creation of a comfortable learning environment through technology. Participant 11 spoke about various "*gadgets and appliances designed to mitigate the heat index,"* making the teaching and learning experience more pleasant. Participant 15 reiterated that "*leveraging technology effectively"* results in a more engaging and effective learning atmosphere.

Moreover, Participant 17 noted that "*technology not only provides solutions such as heat-resistant materials and cooling systems but also minimizes health risks associated with extreme temperatures."* This focus on comfort directly correlates with improved safety and overall learning outcomes, making technology an indispensable tool in today's educational landscape.

Likewise, a positive nurturing environment is an indispensable part of learning. It is in a positive environment that a student feels comfortable; a place where healthy relationships with peers and teachers flourish. In a positive environment, the process of learning becomes something that students easily adapt to and look forward to. To achieve this environment, young students need to be nurtured with love, care, and support. (Verma, 2019)

Navigating High-Heat Challenges in the Classroom: Recommendations for Teachers

As temperatures rise, educators across the globe are confronted with the daunting challenge of teaching in high-heat environments. The shared experiences of teachers who have faced these challenges provide valuable insights and recommendations. Here, we outline five key areas of focus to support teachers in maintaining both their well-being and the quality of education for their learners.

Prioritize Health and Well-being

The cornerstone of effective teaching during heat waves is prioritizing health—both for teachers and students. Participant 1 emphasized the necessity of *"managing stress and finding effective methods to deliver lessons"* without compromising personal well-being. "*Dressing in light, breathable clothing and encouraging hydration"* is essential, as mentioned by participants Participant 5 and Participant 6. Staying cool and comfortable not only enhances personal health but also fosters a more conducive learning environment.

Self-care, as highlighted by Participant 15, should not be overlooked; "*reaching out for professional support*" is crucial if the heat becomes overwhelming. Participant 16 reminds us that "*embracing change and maintaining a passion for teaching"* can help mitigate the challenges posed by high temperatures. A simple prayer for guidance can also offer emotional support in tough times.

Meanwhile, prioritizing teachers' mental health is essential for creating a healthy and productive learning environment. Teachers and school staff have an enormous impact on the lives of students—being sure they are taking proactive measures to support their mental health is an utmost priority for every community. (PAR, 2024)

Classroom Management and Environment

Creating a comfortable classroom environment is paramount. Participant 2 suggested that teachers maintain "*cleanliness and ensure good ventilation*," while also developing heat-aware policies that promote health. It is vital to adapt lesson plans to accommodate the heat. For example, Participant 4 recommends "*incorporating technology to engage students"* while organizing group work to minimize physical exertion.

"Using fans," as advised by Participant 5, can significantly enhance airflow, while Participant 13 encourages the "*use of low-energy activities"* to protect one's physical, emotional, and mental well-being.

"*Adjusting the schedule*," as noted by Participant 14, and implementing shorter activities can help keep students engaged without overwhelming them. Participant 20 further emphasizes the importance of "*flexible pacing, encouraging regular water breaks, and designing interactive lessons"* that demand less movement.

Additionally, Spencer, 2018 quantified that classroom management is when a teacher exhibits complete control over their classroom through a series of strategies and techniques that encourage positive student behavior. The practice of effective classroom management turns the classroom into the optimum learning environment where students can engage with their studies and work to the best of their ability.

Flexibility and Adaptability

The ability to adapt is vital in addressing high-heat challenges. Participant 9 stressed the importance of "*resilience and flexibility in teaching practices*." "*Adapting to the ever-changing landscape of education*" requires knowledge and resourcefulness, as highlighted by Participant 17 and Participant 18. Focusing on the ultimate goal of education—" *creating a healthy, clean, and conducive learning environment*"—can motivate educators to remain positive, even in adverse conditions, as pointed out by Participant 19.

Significantly, Harrison (2024) emphasized that integrating real-world challenges into the curriculum compels students to think critically and collaborate. Allowing students to work under unpleasant situations requires them to explore multiple solutions and adjust their approaches as they encounter new information or face unexpected outcomes. In this aspect, teachers should encourage students to engage in projects that address real-world issues, whether through sustainability initiatives or community service. This real-world problem-solving strengthened their cognitive flexibility, equipping them to navigate ambiguity and adapt to evolving challenges, preparing them for the complexities of the modern workforce.

Technology Integration

Incorporating technology can be a game-changer in maintaining engagement without subjecting students to heat exhaustion. Participant 2 suggested utilizing "*online learning platforms"* to supplement traditional teaching methods. Participant 4 advocated for "*educational technology*" that keeps students engaged while minimizing physical strain. Moreover, Participant 20 emphasized the importance of "*virtual learning tools and interactive educational resources*," which can facilitate lesson delivery and foster a dynamic learning environment.

Likewise, technology helps change the student/teacher roles and relationships: students take responsibility for their learning outcomes, while teachers become guides and facilitators. Technology lends itself as a multidimensional tool that assists that process even during high heat conditions. (Edutopia, 2019)

Collaboration and Support

Lastly, collaboration among educators is vital in overcoming heat-related challenges. Participant 11 highlights the importance of "*meeting regularly to strategize and share solutions"* for managing the difficulties posed by high temperatures. By pooling resources and experiences, teachers can create a support system that enhances their effectiveness in the classroom.

The recommendations outlined above highlight the multifaceted approach needed to navigate the challenges of high-heat environments in education. Prioritizing health and well-being, managing the classroom environment, being adaptable, integrating technology, and fostering collaboration are all essential strategies. By embracing these practices, teachers can create a sustainable and effective teaching atmosphere, ensuring that learning continues even in the face of rising temperatures.

Lastly, the power of collaboration lies in its ability to unite diverse stakeholders in a shared commitment to school safety. By working together, schools, law enforcement agencies, emergency responders, and

mental health specialists can create a comprehensive safety net that protects students and staff from potential threats. Through information sharing, proactive risk mitigation, and integrated response coordination, collaborative partnerships pave the way for safer learning environments and brighter futures for all. (LinkedIn, 2024)

CHAPTER V
INTERPRETATION, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

This chapter presents the interpretation, findings, conclusions, and recommendations of this phenomenological study on the lived experiences of teachers of Juban District amidst high heat index and their resilience in the delivery of instruction. The researcher utilized the participants' responses to sort out themes that served as a foundation for the completion of this book.

Key Concepts

This phenomenological study centered on exploring the lived experiences of teachers of Juban District amidst high heat index and their resilience in the delivery of instruction. It utilized a qualitative approach in examining the data from the twenty participants who were selected through the convenience sampling technique. Since the subject of this study is timely and relevant, the researcher was able to gather sufficient, truthful, and updated responses from the participants who experienced high heat conditions in the delivery of instructions. Their rich and genuine replies pave the way for the successful completion of this book.

Significantly, the researcher categorized the various themes that emerged from participants' responses. These themes aided the researcher in embracing pertinent and useful understandings regarding teachers' perceptions and experiences regarding HHI and its impact primarily on the learners' acquisition of knowledge and teachers' delivery of instruction. In the same manner, the pages in this chapter are sorted accordingly based on six concepts mainly, the impact of a high heat index on the delivery of instruction, strategies employed by teachers to manage the physical and emotional stresses associated with teaching HHI, ways on how teachers adapt their instructional methods to maintain student engagement and learning outcomes during periods of extreme heat, role played by support systems and community dynamics in helping teachers cope with the challenges of HHI, influence of teachers' experiences with high heat conditions on their overall well-being and professional resilience and the mitigating measures employed by teachers during HHI to continue meeting classroom instructions. Moreover, this chapter enabled the researcher to construct accurate and truthful findings, conclusions, and recommendations which were considered salient facets of this recent study.

Furthermore, to collect data from the participants the researcher crafted guide questions which were utilized during the conduct of in-person interviews and focus-group discussions. These processes were religiously observed to ensure the validity and reliability of the results.

With the use of coding and theming, the researcher was able to identify evolving themes which enabled the researcher to present, analyze, and interpret the rich and diverse experiences of teachers from Juban district on the occurrence of high heat conditions in classrooms. In line with this, the researcher also browses the bulk of literature and studies that support the findings of this recent phenomenological study.

Research Questions

This recent study explored the lived experiences of teachers of the Juban district amidst a high heat index and their resilience in the delivery of instruction. The responses of the twenty (20) participants were analyzed and interpreted using various qualitative tools to discover emerging themes significant in the completion of this paper.

Interestingly, this study provided answers to the following questions:

1. How do teachers in the Juban District perceive the impact of the high heat index on their instructional delivery?
2. What strategies do teachers employ to manage the physical and emotional stress associated with teaching in high-heat conditions?
3. How do teachers adapt their instructional methods to maintain student engagement and learning outcomes during periods of extreme heat?
4. What role do support systems and community dynamics play in helping teachers cope with the challenges of a high heat index?
5. How do teachers' experiences with high-heat conditions influence their overall well-being and professional resilience?
6. What mitigating measures can be employed by teachers during high index to continue meeting classroom instructions?

Research Process

The completion of this phenomenological study is rooted in one of the trending issues that confront most of the school managers and leaders. The onslaught of high heat index which is usually experienced by teachers and learners every last quarter of the school-year is a pressing and challenging phenomenon that needs immediate and effective solution since it poses negative impacts not only on the academic and health facets of the learners but also on the work and psychological capacities of the teachers.

The researcher, as an educational leader, was confronted with this issue and courageously delved deeper and explored the lived experiences of teachers in Juban district amidst high heat index and their resilience in the delivery of instruction, This prompt action paved the way for the realization of this paper which aimed at investigating the problem and providing relevant and updated resolution for the betterment of service to the clientele, the learners.

After identifying the inclusions of this study, the researcher took the necessary steps religiously to come up with credible and reliable results. The classification of setting and participants is indeed practical and reasonable since the researcher was immersed in the area, has known the participants for years, and has been closely working with them. In this manner, genuine and ample details are available to the researcher, especially on the conduct of face-to-face interviews and focus-group discussions.

Meanwhile, since phenomenological study requires qualitative tools in analyzing and interpreting data, the researcher made use of coding and theming to identify emerging concepts out of participants' rich responses, these processes allow the researcher to tailor the findings, conclusions, and recommendations of this recent research on the impact of high heat index.

Finally, the objectives in the development of this study were achieved and highlighted in this paper thus, the researcher is certain that the publication of this book would be of great advantage in the educational field.

Findings:

1. The lived experiences of teacher participants in the Juban District were significantly concerned about the high heat index's impact on instructional delivery, as it decreased student concentration and increased health issues, leading to frequent absences and disruptions. Teachers have adapted by incorporating more breaks, and hydration periods, and sometimes shifting to online classes. Despite these efforts, the overall quality of instruction has been compromised, underscoring the need for better infrastructure and climate control measures in schools.

2. Based on the experiences of teacher participants, they employed various strategies to manage the physical and emotional stress of teaching in high-heat conditions. Physically, they incorporate frequent breaks and hydration periods, adjust classroom schedules to avoid strenuous activities during peak heat, and use cooling aids like fans and portable air conditioners. Emotionally, they practice stress management techniques such as deep breathing, mindfulness, and meditation engage in regular exercise and self-care, and seek support from colleagues and professional development workshops.
3. During periods of extreme heat, teachers adapt their instructional methods to maintain student engagement and learning outcomes. They adjusted classroom schedules to include less physically demanding activities during the hottest parts of the day, shifting more intensive subjects to cooler times and incorporating lighter, interactive activities when temperatures peak. Teachers also leverage technology, using online platforms for virtual lessons from cooler environments and incorporating multimedia resources to make lessons more engaging. Interactive modules and collaborative projects help keep students involved and motivated. Additionally, teachers integrated more frequent breaks and hydration periods to ensure students remain comfortable and focused. Creative teaching aids, such as visual and auditory materials, captured students' attention and enhanced understanding despite the challenging conditions. Flexible scheduling and differentiated instruction further supported student learning by tailoring lessons to meet diverse needs, ensuring all students can keep up with the curriculum even when concentration is difficult. These adaptive strategies help create a conducive learning environment, ensuring students remain engaged and achieve their learning outcomes despite the extreme heat.
4. Support systems and community dynamics are crucial in helping teachers cope with high heat indices. Administrative support, such as providing cooling resources and flexible scheduling, creates a more comfortable teaching environment. Community involvement, including donations and awareness campaigns, further aids teachers in managing stress and maintaining effective instruction.
5. Teachers' experiences with high-heat conditions significantly impact their well-being and professional resilience. Physically, prolonged exposure can lead to health issues like heat exhaustion and dehydration, resulting in increased absenteeism and reduced energy levels. Emotionally, the stress of managing a classroom in such conditions can lead to burnout and decreased job satisfaction, but these challenges also foster resilience as teachers develop coping strategies and adaptive techniques to manage the heat.

Conclusion :

1. Improving infrastructure and implementing effective climate control measures in schools are essential to ensure a conducive learning environment and maintain the quality of instruction despite high heat conditions.
2. By incorporating breaks, hydration periods, cooling aids, stress management techniques, and seeking support, teachers effectively manage the physical and emotional stress of teaching in high-heat conditions.
3. During periods of extreme heat, teachers adapt their instructional methods by adjusting classroom schedules, leveraging technology, incorporating frequent breaks and hydration periods, using creative teaching aids, and employing flexible scheduling and differentiated instruction to maintain student engagement and learning outcomes.

4. Support systems and community dynamics, including administrative support and community involvement, are crucial in helping teachers cope with high heat indices and maintain effective instruction.
5. Teachers' experiences with high-heat conditions significantly impact their well-being and professional resilience, as prolonged exposure can lead to health issues and emotional stress, but also fosters resilience through the development of coping strategies and adaptive techniques.

Recommendations:

After careful investigation of the results on the impact of high heat conditions, this phenomenological formulated several recommendations which were enumerated below:

1. Invest in upgrading school infrastructure with effective climate control systems, such as air conditioning and proper ventilation, to create a comfortable and conducive learning environment.
2. Provide regular training for teachers on stress management techniques and ensure access to resources like hydration stations and cooling aids to help them manage the physical and emotional stress of high-heat conditions.
3. Encourage the use of technology and flexible scheduling in lesson planning, and alternative delivery modes and provide teachers with access to digital tools and resources that can enhance student engagement during extreme heat periods.
4. Strengthen community partnerships and administrative support by organizing initiatives such as fundraising for cooling equipment and conducting awareness campaigns about the impact of high heat on education.
5. Offer professional development opportunities focused on building resilience and adaptive strategies, and create a supportive network where teachers can share experiences and coping mechanisms to better handle high-heat conditions.
6. Future researchers are encouraged to undertake the following research topics:

- "Adapting to Extreme Heat: The Impact on Teaching Practices and Teacher Well-being in Juban District"
- "Heat Resilience in Education: Strategies and Experiences of Teachers in High-Temperature Environments"
- "Navigating Classroom Challenges: Teacher Adaptation and Resilience in Response to High Heat Index in Juban District"

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