

From Pandemic Challenges to Future Preparedness: The Role of Environmental Education in Enhancing Students' Resilience

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Abstract

This study examined the COVID-19 pandemic's various effects on students, emphasizing the social, emotional, economical, and intellectual difficulties they faced while under quarantine. Fifteen students from the Integrated Laboratory School in Grades 7 through 10 had their lived experiences recorded using a qualitative phenomenological study design. Purposive sampling was used to choose participants, who ranged in age from 13 to 17. Semi-structured online interviews using Zoom and Google Meet were used to collect the data, which were then subjected to theme phenomenological analysis. Four main themes emerged from the findings. First, students encountered academic difficulties that were characterized by interrupted instruction, inadequate internet connectivity, restricted access to technology, limited teacher-student engagement, and waning desire. Secondly, students and their families were severely affected by financial hardships; many households faced food insecurity, income loss, and the inability to pay for educational materials. Third, emotional and psychological issues surfaced, such as anxiety, fear, stress, loneliness, insomnia, and future uncertainty. Finally, social isolation affected family dynamics and peer interactions, which worsened emotional suffering and feelings of loneliness. The study came to the conclusion that the pandemic increased already existing gaps among students by acting as a health crisis as well as an educational, economic, and even environmental disaster. The findings highlight the need for equitable access to technology, strengthened mental health support systems, and inclusive educational interventions to enhance resilience during future crises.

Keywords: *effects of covid-19 , environmental education and awareness, mental health, pandemic resilience*

INTRODUCTION

Early in 2020, the COVID-19 pandemic became a worldwide health emergency, leading to extensive school closures in an effort to prevent the spread of the virus. At its height, more than 1.6 billion students worldwide were affected by the suspension of in-person instruction in educational institutions across more than 190 nations (UNESCO, 2020; McKinsey & Company, 2022). The quick adoption of remote learning modalities by educational systems as a result of this unprecedented disruption, frequently without sufficient planning or resources, exposed serious structural issues with formal education. In addition to stopping regular education, school closures restricted access to vital school-based services including nutrition programs and healthcare resources, making children and adolescents more vulnerable.

The sudden transition to online and modular learning revealed substantial social and technological inequalities for many pupils. Research from around the world shows that students who didn't have digital devices or dependable internet access were disproportionately disadvantaged during remote learning, which resulted in larger gaps in learning opportunities (Colvin et al., 2022; International Journal of Educational Technology in Higher Education, 2023). Lack of technology hindered academic engagement and was linked to higher psychological distress among students, according to a study addressing the digital gap during emergency remote learning (Islam et al., 2021).

These results are consistent with research showing a wide range of distant learning outcomes, with students in resource-constrained environments showing lower academic progress and lower participation than their classmates (Ma & LingZhen, 2021).

The epidemic had a significant impact on pupils' social and emotional health in addition to their academic performance. According to research, children and adolescents who were separated from their classmates for an extended period of time and had their daily routines disturbed experienced higher levels of loneliness, anxiety, and depression (Viner et al., 2020; Secondary Education and COVID 19, 2021). Key chances for social connection and support—factors essential to adolescent psychosocial development—were eliminated by the disappearance of regulated school environments.

Additionally, different effects of school closures along socioeconomic lines indicate that students from lower-income backgrounds had more mental health issues, partly because they had less access to in-person support and more stressors related to remote learning (Meyer et al., 2021; JAMA Network Open, 2020). When considered together, these worldwide patterns show that the COVID-19 pandemic's educational environment was influenced not only by public health concerns but also by the unequal distribution of educational resources, technological capability, and socio-emotional support networks. Policies that address present vulnerabilities and future crises must be informed by an understanding of the pandemic's complex effects, which include academic achievement, emotional well-being, and access gaps.

In order to provide light on how the pandemic worsened educational vulnerabilities that go beyond brief school closures, this study places learner experiences within this larger framework. The COVID-19 pandemic was a crucial educational experience that improved students' comprehension of public health, environmental responsibility, and crisis preparedness in the context of environmental education and awareness. The pandemic raised awareness of sanitary practices, social responsibility, and sustainable behaviors by highlighting the connection between human activity, environmental factors, and community health. Nevertheless, many students still had educational vulnerabilities that had an impact on their academic performance and psychological well-being in spite of this increased knowledge. Understanding how environmental education and awareness can support resilience, adaptive learning, and well-informed decision-making during global crises requires an examination of these complex consequences. Therefore, the goal of this study is to investigate the many experiences that students had during the pandemic and how these experiences might affect environmental education and awareness.

RELATED LITERATURE AND STUDIES

The COVID-19 pandemic disrupted educational systems worldwide, compelling a rapid shift from traditional in-person instruction to emergency remote learning. Governments in over 160 countries implemented school closures in early 2020, affecting more than 1.6 billion learners (UNESCO, 2020). Research indicates that this abrupt transition exposed and intensified underlying educational vulnerabilities, particularly in access to technology and instructional support (Kennedy et al., 2022). In a large-scale study on remote learning quality, Kennedy, Mejía-Rodríguez, and Strello (2022) found that disparities in students' access to technological tools, internet connectivity, and home learning environments led to unequal experiences and perceptions of remote learning quality across contexts. This suggests that although remote instruction prevented total academic cessation, it also magnified pre-existing educational inequities, with students from low-resource backgrounds disproportionately disadvantaged.

Empirical studies further highlight that educational disruptions extended beyond access issues to actual learning outcomes. For example, Ma and LingZhen (2021) demonstrated that school closures were associated with measurable declines in academic participation and progress, particularly in subjects like mathematics, among students in areas with lower income and limited digital infrastructure. These findings align with evidence suggesting that the pandemic has created enduring learning losses (McKinsey & Company, 2022). Such setbacks were not uniform; students from economically advantaged communities exhibited quicker recovery in academic performance compared to their peers from middle- and low-income districts, signaling a deepening of performance gaps post-pandemic (Massachusetts news report, 2025). Collectively, these studies reinforce the view that the pandemic's educational impact was unevenly distributed and closely tied to socioeconomic status and resource availability.

In addition to cognitive and academic challenges, the pandemic exerted significant psychological effects on learners. A systematic review by Elharake et al. (2023) documented that children and college students reported elevated levels of anxiety, depression, distress, and fatigue during school closures, compared to pre-pandemic conditions. This mental health burden was compounded by the isolation inherent in physical distancing measures, a trend that was also evident in studies examining student feelings across multiple educational levels. Research involving over 13,000 students reported prevalent negative emotions—such as stress, anxiety, and depression—during lockdown periods (Husky, Vaiva et al., as cited in Heliyon, 2021). These emotional responses can undermine motivation and academic engagement, emphasizing the psychosocial dimensions of educational vulnerability.

The relationship between psychological distress and academic performance has also been explored in recent research. A study on university students found that heightened COVID-19 anxiety negatively influenced academic motivation and life orientation, key factors associated with academic success (Cayubit, 2024). Parallel findings from campus settings reveal that declines in academic performance were linked to mental health stressors, financial status, and the need for psychological support (Siena et al., 2024). These interconnections between emotional well-being and academic outcomes underscore the multifaceted nature of pandemic-related educational vulnerabilities, where mental health and learning are reciprocally influential. Moreover, literature suggests that the pandemic's impact extended into students' social lives. Kumar, Brydges, and colleagues (2023) reported that adolescents experienced disruptions in social interaction and academic achievement due to COVID-19, highlighting how isolation from peers contributes to declines in both social well-being and educational engagement. These findings are consistent with broader analyses indicating that changes in social behavior and reduced peer contact can exacerbate feelings of loneliness and disengagement, particularly among learners dependent on school structures for social support (Elharake et al., 2023). Studies examining low-income contexts provide further evidence of compounded vulnerability. Research in remote regions with limited infrastructure showed that learners struggled both academically and technologically due to inadequate government support and a lack of preparedness for remote learning environments (Katyal & Charlton, 2020). Similarly, investigations into technology access reveal that disparities in digital readiness—such as unequal device availability and shared access responsibilities—intensified challenges faced by first-generation and financially stressed students (MDPI study, 2024). These insights demonstrate that infrastructure limitations and socioeconomic pressures are central determinants of educational resilience during crises.

In summary, scholarly literature consistently portrays the COVID-19 pandemic as a catalyst for educational vulnerabilities that span academic, technological, psychological, and social domains. Students with limited access to technology, robust instructional support, and stable home environments experienced more pronounced difficulties in continuing education and maintaining well-being. As studies affirm, recovery efforts must therefore address not only instructional quality but also mental health, access equity, and socio-emotional support to mitigate the pandemic's enduring effects on learners.

Environmental Education and Awareness

Environmental Education plays a significant role in developing students' awareness, responsibility, and adaptive behaviors toward environmental and societal crises. During the COVID-19 pandemic, environmental education became increasingly relevant as learners were exposed to issues concerning public health, sustainability, hygiene, and socio-environmental resilience. According to Environmental Education Research, environmental education contributes to socio-ecological resilience by helping students understand the interconnectedness of human behavior, environmental systems, and global crises. Servant-Miklos (2022) emphasized that the pandemic served as a "litmus test" for environmental education, demonstrating the importance of resilience, adaptability, and critical awareness during periods of disruption. The study further explained that environmental education encourages reflective thinking and active participation in addressing societal and environmental challenges, particularly during emergencies (Servant-Miklos, 2022).

Research also suggests that environmental education strengthens students' environmental awareness and promotes pro-environmental attitudes and behaviors. A study published in the Indonesian Journal of Educational Research and Review found that students exposed to environmental education developed deeper understanding of environmental issues and became more engaged in environmental protection activities. The findings indicated that environmental awareness is influenced by educational experiences that cultivate critical thinking, responsibility, and participation in sustainability-related practices. Similarly, Judijanto et al. (2024) reported that educational programs focused on environmental and social awareness positively influenced students' environmental consciousness and encouraged active involvement in conservation efforts. These studies highlight the role of environmental education in shaping socially responsible learners capable of responding to contemporary environmental and public health issues (Ali, Abduh, Mahmud & Dunakhir, 2023).

Furthermore, studies conducted during the COVID-19 pandemic revealed that environmental education supported students' emotional resilience and awareness of crisis preparedness. Beery (2020), in a study published in *Sustainability*, explained that environmental and outdoor education provided opportunities for participatory risk management and adaptive learning during the pandemic. The study emphasized that environmental education can help learners develop resilience, problem-solving skills, and awareness of health and environmental risks. Likewise, Butler et al. (2022) noted that experiential environmental education enabled students to critically examine their relationship with the environment while promoting well-being and resilience amid the disruptions caused by COVID-19. These findings suggest that environmental education is not limited to ecological awareness alone but also contributes to students' psychosocial development and preparedness during crises (Beery, 2020).

RESEARCH QUESTIONS

1. What are the challenges experienced by learners during the COVID-19 quarantine period?
2. How can environmental education and awareness contribute to students' resilience and preparedness during future public health crises?

THEORETICAL FRAMEWORK

The Ecological Systems Theory and the Transformative Learning Theory provide an appropriate theoretical foundation for the study "Examining the Multifaceted Effects of COVID-19 on Students: Perspectives on Environmental Education and Awareness." According to Bronfenbrenner (1979), ecological systems theory describes how a variety of environmental systems, including the family, school, community, media, and socioeconomic circumstances, affect children's experiences and growth. Disruptions in these interrelated systems during the COVID-19 epidemic had a major impact on students' access to learning materials, social interaction, mental health, and academic achievement (Aristovnik et al., 2020). The theory is relevant because it highlights how students' experiences are influenced by broader environmental and societal situations in addition to personal variables.

However, through critical reflection on challenging situations, people acquire new perspectives, according to Transformative Learning Theory (Mezirow, 1997). Students' understanding of environmental cleanliness, public health, sustainability, and disaster preparedness increased as a result of the COVID-19 epidemic, which became a life-changing event. Students may gain resilience, adaptive behaviors, and a better comprehension of the connection between environmental health and human activity through environmental education and awareness (Merriam, 2004). Combining these theories highlights the importance of environmental education in fostering awareness and crisis readiness while offering a thorough perspective for analyzing the complex effects of the epidemic on students.

METHODOLOGY

With an emphasis on areas like education, socializing, and home life, this study used a phenomenological qualitative research design to investigate the lived experiences of students during the COVID-19 epidemic (Creswell & Poth, 2017; Moustakas, 1994). Fifteen students in 7th to 10th grade from one of the University's Integrated Laboratory School, ages 13 to 17, participated in the study. The researcher chose people who could offer deep insights into the topic of interest by purposive sampling (Creswell, 2012). In order to contextualize the learners' experiences, demographic data such as age, grade, gender, address, and religious affiliation were gathered. Pseudonyms were used to safeguard the learners' identities. Google Meet and Zoom were used to conduct in-depth, semi-structured interviews for data collection. The interviews were accurately recorded and transcribed.

The participants' daily routines, academic difficulties, social interactions, and emotional health throughout the pandemic were the main topics of the interview questions. Significant statements were classified and arranged into themes that represented common experiences using phenomenological analysis. Husserl's (1938) and Vagle's (2014) writings on descriptive phenomenology served as the basis for the methodological

approach, which focused on participants' conscious experiences while utilizing behavioral theories like Skinner's reinforcement principle to comprehend how experiences affected behaviors. By getting participant and parental agreement, upholding strict ecological validity criteria, and maintaining confidentiality, the study achieved ethical rigor and validity. In order to carefully control emotional reactions during interviews, the researcher served as a facilitator, listener, and at times a counselor.

Expert review by a psychologist confirmed that the interview questions effectively captured the objectives of the study. Overall, this methodology allowed for a comprehensive understanding of adolescents' multifaceted experiences during the pandemic while safeguarding ethical considerations and ensuring the credibility of the findings.

RESULTS AND DISCUSSION

On the Challenges Experienced by Learners during The COVID-19 Quarantine Period

Theme 1: Academic Challenges – Disrupted Learning and Inequality in Access

Students experienced severe academic disruption as a result of the abrupt shift from in-person instruction to online and modular learning. The absence of comprehensive responses from teachers made it difficult for participants to understand the instruction, which was made worse by unstable and slow internet connections. Many also found it difficult to fully engage in remote learning because they lacked access to necessary learning resources like laptops, smartphones, and printers. Some students battled with little incentive to study, while others relied more on peers, family, or siblings to complete modules as a result of less teacher-student engagement. These difficulties additionally encouraged a persistent concern about possible learning loss and academic setbacks during the time of distance learning.

A number of students stressed that they were used to structured classroom settings where teachers gave daily teaching and prompt feedback. Confusion, disinterest, and decreased comprehension resulted from the lack of in-person instruction. The only resources available to learners without devices or internet access were printed modules, which they found challenging to comprehend on their own. Some acknowledged that they had perceived learning gaps as a result of asking their siblings to complete modules for them. Others worried that they wouldn't learn enough to progress academically. The results show that educational inequality was made worse by distant learning. Over 1.6 billion students worldwide were affected by school closures, which widened gaps in educational opportunities (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2020). Because they had access to technology and parental academic support, students from rich families were better equipped to adjust, whereas students from low-income families encountered significant barriers.

One of the main causes of learning loss during the epidemic has been found to be digital inequality. The Organization for Economic Co-operation and Development (OECD, 2020) found that pupils were more likely to fall behind academically if they lacked access to dependable internet and digital gadgets. In the same manner, Di Pietro et al. (2020) discovered that low-income children were particularly adversely affected by remote learning environments because of the lack of instructional interaction and home learning support. Academic motivation and accountability were diminished in the absence of organized classroom interaction. Adolescents are still developing the cognitive maturity and structured supervision needed for self-regulated learning (Zimmerman, 2002). Without teacher presence and peer engagement, many learners struggled to maintain academic discipline. Thus, while modular and online learning were necessary emergency measures, they were not equally accessible nor equally effective across socioeconomic groups.

Theme 2: Financial Challenges – Survival Over Schooling

During the quarantine, students' main concern became their financial survival, which frequently took precedence over their academic responsibilities. The loss of parental income and dependence on relief supplies from the barangay and other donors were among the severe financial hardships that participants from low-income families described. Many also experienced food insecurity, which resulted in the restriction

of necessities like rice. Additionally, families found it challenging to buy the devices and school supplies required for distance learning due to their limited financial resources. Some students used small-scale income-generating hobbies as a coping strategy to aid with household expenses.

Families that depended on daily income suffered the most by the quarantine. Lockdown measures significantly affected informal workers, lowering household income and raising the likelihood of poverty, according to the International Labour Organization (ILO, 2020). Food insecurity has a direct impact on both psychological health and academic achievement. According to research, children from homes where there is food insecurity experience more stress and are less engaged in school (Dunn et al., 2020). Adolescents' emotional distress may also be worsened by household financial difficulty (Conger et al., 2010). The stories in this study show that the pandemic's effects have been made worse by poverty. According to Maslow's (1943) hierarchy of requirements, which holds that physiological and safety needs must be satisfied before higher-level endeavors like learning can be prioritized, education briefly took a backseat to survival demands.

Theme 3: Emotional and Psychological Challenges – Fear, Anxiety, and Uncertainty

During the pandemic, most participants reported feeling very high levels of mental discomfort. This includes physical symptoms including palpitations and panic attacks, increased anxiety brought on by continuous exposure to COVID-19 news, and anxiety of infection and death. In addition, many suffered from emotional breakdowns, frequent crying episodes, sleep difficulties, and enduring depressive and gloomy feelings. Participants also reported worrying excessively about the future, which increased their psychological stress. The responders were more psychologically vulnerable as a result of the general uncertainty surrounding the pandemic's duration and come to an end.

The results emphasize the effects of extended quarantine on mental health. Due to social isolation and uncertainty, studies carried out during the COVID-19 pandemic revealed high levels of anxiety and depression symptoms among adolescents (Loades et al., 2020).

Psychological distress has been linked to excessive exposure to upsetting media news (Garfin et al., 2020). These findings are consistent with the learners' reports of anxiety brought on by social media and television. Adolescence is a crucial developmental period marked by social interaction and identity building (Erikson, 1968). Long-term isolation can lead to anxiety and emotional instability and interfere with appropriate psychosocial development. The findings highlight how crucial it is to incorporate mental health support networks into schools during emergencies.

Theme 4: Social Challenges – Isolation and Disrupted Relationships

Due to quarantine limitations, the participants faced social barriers such as reduced engagement with peers and classmates and separation from parents, especially among those from OFW families. Their social well-being had additional effects by decreased peer participation and family disputes brought on by financial strain. Due to their inability to engage in typical school activities and opportunities for social bonding, many students expressed feelings of loneliness and boredom. Some people who were separated from their parents expressed intense emotional desire and pain, while others were socially deprived due to the extended lack of in-person interactions and social life at school.

Schools are important places for teenage socialization in addition to being academic institutions. Emotional management and identity formation are greatly influenced by peer relationships (Steinberg, 2014). Emotional instability and loneliness were further complicated by the loss of peer engagement. According to research conducted during the pandemic, youth's emotions of loneliness were considerably heightened by social isolation (Ellis et al., 2020). Emotional fragility has been linked to parental separation, especially in international households (Parreñas, 2005).

However, through shared activities, families with strong internal support networks lessened some of the negative impacts of social isolation. This lends validity to ecological systems theory, which holds that the family microsystem is essential for stress buffering (Bronfenbrenner, 1979). Overall, teenagers' social development and sense of belonging were hampered by quarantine, highlighting the critical role that schools play in psychosocial development.

On The Role Of The Environmental Education And Awareness To The Students' Resilience And Preparedness During Future Public Health Crises

By promoting critical thinking, adaptive behaviors, and responsible decision-making, environmental education and knowledge can greatly increase students' resilience and readiness for future public health emergencies. Research published in international journals highlights how environmental education aids students in comprehending how human health, environmental circumstances, and social well-being are interrelated. Environmental Education Research claims that by raising students' awareness of sustainability concerns, public health procedures, and crisis-response techniques, environmental education during the COVID-19 pandemic enhanced socio-ecological resilience (Servant-Miklos, 2022). By practicing hygiene, comprehending health regulations, preserving resources, and taking part in community-based solutions, students who are more environmentally conscious are better equipped to respond correctly to emergencies. Additionally, learners' sense of responsibility and readiness to handle upcoming disruptions and environmental difficulties are strengthened by these educational experiences.

Furthermore, environmental education helps students become emotionally and psychosocially resilient in times of crisis. Environmental and outdoor education promoted adaptive learning, collaborative problem-solving, and emotional well-being throughout the pandemic, according to research published in Sustainability (Beery, 2020). In the same manner, Butler et al. (2022) described how experiential environmental learning improved coping abilities and resilience in the midst of uncertainty while encouraging students to consider their relationship with society and the environment. These results imply that environmental education not only raises students' understanding of environmental and health-related issues but also gives them the resilience, practical abilities, and emotional readiness needed to effectively handle future public health emergencies.

CONCLUSION

For many participants, survival concerns overshadowed academic priorities, demonstrating how economic hardship directly influenced learning engagement and outcomes. Moreover, the prolonged quarantine negatively affected learners' mental health, leading to anxiety, fear, and psychological distress. Social isolation and family separation significantly impacted adolescents' emotional well-being, as the absence of peer interaction and, in some cases, parental presence heightened feelings of loneliness and uncertainty. Socioeconomic status played a critical role in shaping the overall quarantine experience, influencing access to resources, emotional stability, and academic continuity. Overall, the lived experiences of the learners reveal that the pandemic was not only a health crisis but also an educational, economic, and psychosocial crisis that reshaped multiple dimensions of their lives.

Academic performance, financial stability, mental well-being, and social relationships were all affected by the multifaceted difficulties brought forth by the quarantine. The severity of these difficulties was significantly influenced by socioeconomic status. Students showed awareness, resiliency, and a desire to resume regular education in spite of the challenges.

The results show that the COVID-19 quarantine period significantly disrupted academic performance, especially for students who had little access to technology and instructional support. Perceived learning gaps were caused by the sudden shift to online and modular learning, which revealed disparities in digital access and decreased opportunities for aimed instruction. Financial instability increased emotional and academic difficulties, particularly for students from low-income homes whose families found it difficult to meet their basic needs.

RECOMMENDATIONS

A number of suggestions are made in light of the study's findings and conclusions to deal with the social, emotional, financial, and academic difficulties that students faced during the quarantine. Strengthening blended learning systems is advised for educational institutions, especially for students from underprivileged backgrounds, in order to guarantee equal access to instructional materials. To lessen digital inequality, educational institutions might set up loan programs for gadgets and offer internet subsidies to students who are struggling financially. Remedial and bridge programs can also be utilized to close learning gaps brought

up by extended school closures. Additionally, schools are encouraged to establish up easily available counseling and mental health facilities to support students' psychological wellbeing in times of difficult circumstances.

In order to maintain engagement and provide guidance, teachers must be in constant contact with pupils throughout emergencies. Students' emotional growth and resilience can be further supported by including socioemotional learning activities into classroom instruction. It is recommended that parents and guardians support open communication in the home so that children can share their worries and fears. Emotional stability and continuing education may also be enhanced by limiting excessive exposure to disruptive media content and encouraging disciplined study habits at home.

Future scholars are encouraged to look into how environmental education affects students' resilience and readiness for public health emergencies in the long run. A better knowledge of how environmental awareness affects adaptive behaviors and coping mechanisms may be obtained through comparative studies across various educational levels and socioeconomic backgrounds. Researchers may also investigate how well students' crisis response and psychological well-being can be enhanced by including environmental and public health education into school curricula.

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