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GEOGRAPHIC RESILIENCE IN EDUCATION: A GROUNDED THEORY OF HIGHLAND STUDENTS' REMOTE LEARNING EXPERIENCES

(Research Article)

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Abstract

The unprecedented COVID-19 pandemic necessitated the necessity continuous delivery of education, compelling institutions to devise innovations and alternative learning modalities such as remote learning. While resilience is recognized as a powerful tool for thriving during crisis, it may vary significantly across diverse geographic contexts, particularly among students in highland areas. This study aimed to generate a theory that comprehensively explains remote learning in the Highland areas. Utilizing the grounded theory approach to investigate the phenomenon of interest, data were obtained through a semi-structured, in-depth interview with fourteen (14) purposively-selected students residing in the highlands of a province in Mindanao, Philippines. Through qualitative thematic analysis, themes were identified, compared, and integrated based on conceptual similarities. The themes that emerged from participants' narratives encapsulated their experiences, contextual challenges and coping mechanisms. These themes include: (1) Acceptance of a New Learning Modality, (2) Autonomy in Learning, (3) Access to Technological Infrastructures and Networks, (4) Agency of Students, and (5) Aspirations to succeed. The synergy of the themes paved the way for the development of Geographic Resilience in Education Theory.

Keywords: Geographic resilience, remote learning, highland learning, grounded theory

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1. Introduction

1.1. Rationale

The COVID19 pandemic, with its rapid and uncontrollable spread, disrupted established norms, posing significant and unprecedented challenges for countries worldwide. It has affected all sectors, and education is not an exempt. As the International Association of Universities (2020) reported, the closure of educational institutions affected over 1.5 billion students globally (Cahapay, 2020). The International Association of Universities (2020), an independent global organization affiliated with UNESCO, initially reported that more than a billion and a half students across the world are affected by school closures due to the COVID-19 outbreak (Cahapay, 2020). In response to health concerns and governmental mandates, educational institutions globally swiftly transitioned to remote learning modalities. In the Philippine educational context, the imperative to sustain and ensure the provision of quality education despite lockdown and community quarantine underscored the necessity of formulating "new normal education policy. (Tria, 2020). Hence, this unprecedented crisis pushed Higher Education Institutions (HEIs) to implement alternative delivery modes such as remote learning.

Remote Learning, also called Distance Education, occurs when the learner and instructor, or source of information, are separated by time and distance and therefore cannot meet in a traditional classroom setting. Information is typically transmitted via technology (email, discussion boards, video conference, audio bridge) so that no physical presence in the classroom is required (Training Industry, 2020). In the wake of COVID-19 pandemic, the rapid evolution of the increase utilization of remote learning has been instantaneously welcomed by educational sector in an attempt to reduce face-to-face contact and thereby minimize community transmission that could expand quickly in dense social network like schools (Murphy, 2020). While the use of remote learning has proven to deliver higher education without the necessity for attendance at a campus in developed countries and highly-urbanized locales, it may not be true across diverse socio-cultural and geographical contexts, including those residing in highland communities (Buendicho, 2023.

Highlands refer to areas of a country that are mountainous or elevated, It is characterized by its distinct feature such as geographic remoteness, unique cultural contexts, and limited technological infrastructure. These factors create a specific context for remote learning in highland communities, different from its counterparts in the cities and lowland areas. Gaining comprehensive understanding on the experiences of highland students is crucial for developing informed educational policies and practices that are specifically suited to meet their needs.

In the case of the Participant University, which is a Higher Education Institution in the Bukidnon, a highland province of Mindanao, it provides education to students who are undergoing remote learning, from all over the province, including those residing on highlands, mountains and areas near the mountains. The researcher intends to explain remote learning with the possibility that though it may have proven to be an obvious answer for remote learners, the

role of location and individual circumstance in the highlands may have shaped the students experience (Macintyre, R. & Mcdonal J, 2011) of remote learning.

Available imperative studies focus on the mental health and burnout levels among teachers in remote mountain areas with undeveloped economies (Chen, et al., 2014), and on instructional designs (Ritzhaupt, Stewart, Smith, & Barron, 2010). Limited discussions were found on elucidating the experiences of students from the highland who are considered vulnerable groups and may be at risk of different stresses (Cahapay, 2020) and disparity of access to education. This study aims to contribute to this literature gap.

Additionally, knowledge gaps were also identified on the lack of comprehensive understanding on the specific challenges, oppurtunities, concerns, voices, successes of highland students during remote learning Jones (2020) asserted that the majority of existing studies mostly focus on experiences in urban and suburban environments. Researches on remote learning frequently highlights standardized results or experiences in metropolitan environments (Means et al., 2010). Yet, there is a scarce discussion on highland students who may face distinct experiences and challenges brought by their geographical context. The study of Unterhalter & Zhang (2022) discussed that the limited access to technology and reliable internet connectivity in the highlands impedes involvement and interaction of student in online platforms and resources. Guri – Rosenblit (2020) further elaborated stating that the geographic remoteness of the highland areas limits the students' access to educational resources, opportunities for collaboration, and support networks that are typically easily accessible in urban environments.

It is in this context that the present study would like to generate a theory that comprehensively describes how remote learning is experienced by the students in the Highland areas. It aims to unveil the themes from the stories of the informants that can provide a grounded construct to formulate an understanding of what it is like to be studying remotely in the highlands.

1.2. Statement of Problem:

The purpose of the study is to generate a theory that comprehensively describes remote learning in the Highland areas. Specifically, this study aims to contribute knowledge, particularly in the areas of (1) experiences, (2.) contextual challenges, and (3) strategies or mechanisms that work best in learning remotely from the highlands and other emergent themes.

2. Method

2.1. Research Design & Frameworks

To develop a theory that captures the unique experiences of remote learning in highland areas, this study employs **grounded theory** using the **Glasserian approach** (Glaser & Strauss, 1978). Grounded theory is particularly well-suited for this research because it allows for the

emergence of theoretical insights directly from participants' lived experiences rather than imposing preconceived frameworks. Given the limited existing literature on remote learning in highland regions, this approach ensures that the voices of participants are central to theory development, providing a deeper and more contextually relevant understanding of the phenomenon.

The purpose of this research is to develop a theory of educational adaptation in remote highland settings, with an emphasis on how students deal with constraints such as geographical isolation, inadequate technical infrastructure, and sociocultural influences. Strauss and Corbin (1990) underline that theories are "created, developed, and critically evaluated using an organized system of data collection and analysis focusing on the specific phenomenon" (p. 23). Following this approach, inductive reasoning is used to advance from specific observations to bigger theoretical generalizations. This "bottom-up" strategy entails discovering patterns in qualitative data, developing preliminary hypotheses, and finally building a grounded theory to explain the adaptation strategies and obstacles found in highland remote learning environments.

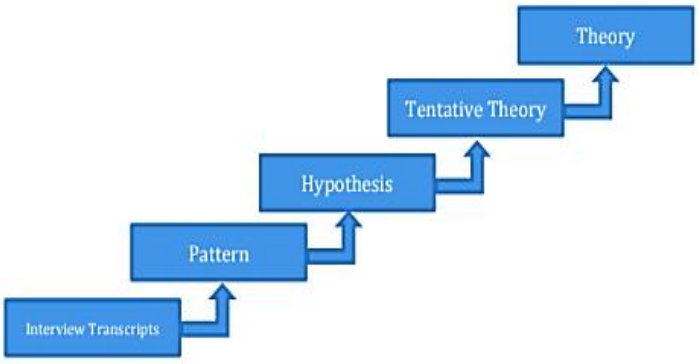

Figure 1: The Research Process of Theory Generation

2.2. Research Setting

Since the study explores how remote learning happens in the highland, a geographically remote location, the researcher finds it significant to describe the locale in detail. The study was conducted in the province of Bukidnon. It is a land-lock province located at the center of the Mindanao Island. The province was acclaimed as the highland paradise in the heart of Mindanao. Figure 2 illustrates that the majority of the municipalities in Bukidnon are situated at elevations ranging from 300 to 1000 meters above sea level (masl), while some municipalities are located at elevations over 1000 masl. The geographical characteristics, such as elevation and slope, play a significant role in the experiences and challenges by students in remote learning settings. Gaining a comprehensive understanding of the precise geographical circumstances of

Bukidnon is essential for formulating a grounded theory on the resilience of Highland students in distant learning.

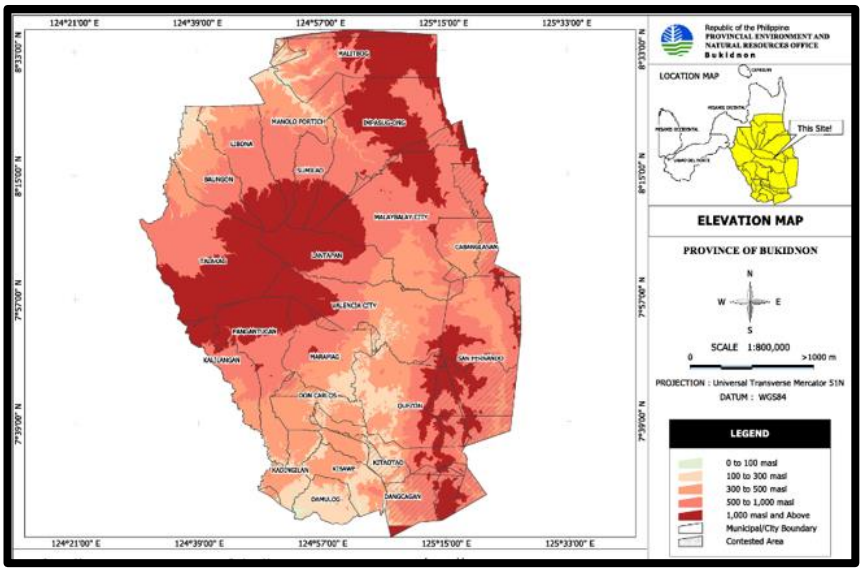

Figure 2. Elevation Map of the Province of Bukidnon
Source: Provincial Environment and Natural Resources Office – Bukidnon

2.3. Research Sampling

The participants of this research are college students of a Philippine State University in the province of Bukidnon. This study employed a purposive sampling technique which allows the deliberate selection of participants based on specific criteria relevant to the research focus. Purposive sampling is a non-random technique wherein researchers identify individuals who possess the knowledge or experience necessary to provide rich and meaningful insights (Bernard, 2002).

To ensure representation and relevance, the participants were selected based on the following criteria:

a) He/she is a bona fide student of the university for the school year 2021-2022

b) He/she resides in a highland area or municipality of Bukidnon;

c) He/she is enlisted in the university's survey on students' flexible learning modality preferences;

d) He/she is accessible for interviews via mobile/cellular phone; and

e) He/she is willing to participate and provide honest responses.

A total of fourteen (14) students were interviewed. This number was determined based on data saturation, a key concept in grounded theory research. Saturation occurs when no new themes, patterns, or insights emerge from the data (Urquhart, 2013, p. 194), signaling that additional interviews are unlikely to provide further theoretical contributions. In this study, saturation was assessed through constant comparative analysis, wherein each new interview was

examined against previously collected data to identify recurring patterns. When successive interviews no longer introduced novel insights, data collection was concluded.

The selection of 14 participants took into account both methodological and practical criteria. Prior grounded theory studies indicate that a sample size of 10-30 individuals is frequently sufficient to reach saturation, depending on the complexity of the research issue (Charmaz, 2006). Practically, accessibility and participants' willingness to engage in in-depth talks influenced the final sample size. Furthermore, the sample's diversity was considered to ensure a thorough grasp of remote learning experiences in the highlands. Participants were from various socioeconomic origins, geographical regions within highland communities, and had a variety of flexible learning experiences, including students with limited access to technology and varying levels of institutional support. This technique guaranteed that the emerging theory adequately reflected the different obstacles and adaptive strategies used by highland students in remote learning environments.

2.4. Data Collection Instruments

To facilitate the gathering of data, the researcher utilized a validated researcher-made semi-structured interview schedule/guide consisting of two parts – Part A, demographic information, including age, gender, academic program, and geographical location; and Part B is composed of Open-ended semi-structured questions aligned with the study's objectives. The key themes of the interview questions included the (1) Experiences in remote learning; (2) Challenges encountered; and, (3) Adaptive strategies and coping mechanisms.

Three experts in relevant fields assessed the content validity of the interview questions. These professionals included (1) a professor specializing in **educational administration**, (2) a university director with a designation on innovative teaching and learning and (3) an instructional system design specialist. Their insights guaranteed that the questions were clear, relevant, and capable of gathering meaningful data in line with the study's objectives.

2.5. Data Collection and Analysis of the Data

The data collection process took place at a Philippine State University at the province of Bukidnon. The researcher conducted a semi-structured interview with 14 students. An augmented form called online interview was done. It is an accepted research method conducted using communication mediated by computers (Salmons, 2014).

Given the geographical constraints and technology limitations of students in highland areas, online interviews were chosen over in-person interviews to improve accessibility and feasibility. This strategy enabled individuals to share their experiences without the need for significant travel, which would have imposed logistical and financial constraints.

The researcher asked for an appointment with the participants for orientation of the purpose of the study. An electronic and/or printed Informed Consent Form were provided to all the participants. Electronic consents were sent through Messenger and email while students who may not have smart phones to respond to on-line messaging applications received their informed

consent form through local couriers. The consent specified that the augmented interview will be recorded. Due to the varied schedules of each participant, interviews were conducted at various times and days of the week. Another appointment was scheduled for the actual augmented interview.

2.5.1 Coding and Categorizing Data: Open coding entails the process of analyzing data to identify and extract a certain set of categories and their corresponding properties. This is achieved by the process of coding for a wide range of categories without any predetermined set of codes (Glaser, 1978). During the process of open coding, the researcher assigned labels to the text of each interview, identifying new areas of investigation that influenced future data collection efforts.

2.5.2 Theoretical Sampling: As codes and memos accumulated, the researcher started to perceive relationships between them. This process, called, conceptualized the interrelation of substantive codes by generating hypotheses for integration into a theory. Therefore, theoretical codes emerged from open coding and theoretical memos, weaving a new story from the fragmentation of open coding (as suggested by Lehmann, 2001b). The grounded integration of concepts is a flexible activity that provides broad pictures and new perspectives. However flexible, theoretical codes must remain grounded on data, they cannot be empty abstractions.

Grounded theory is distinguished by systematic techniques that guarantee the "groundedness" of emergent theories. According to Charmaz (2006), the constant comparative approach and coding are essential for developing grounded theories. The constant comparison technique entails continuously assessing and contrasting data during the coding process, refining emergent themes and guaranteeing theoretical coherence (Glaser & Strauss 1967).

This study used three phases of coding—open, axial, and selective coding—to examine qualitative data acquired from highland students in Bukidnon, Philippines. These coding processes allow for a methodical approach to theory construction. Throughout the procedure, constant comparison was used, iteratively contrasting new data with old codes and categories to ensure that emerging concepts were developed as the study continued. Early interview data were evaluated to establish initial codes, which were then compared to later interview data to validate, enlarge, or modify categories, enabling continuous development of theoretical constructs.

Furthermore, theoretical sampling was used to improve the strength of the emergent theory. In grounded theory, theoretical sampling entails picking additional participants or data sources as concepts develop (Corbin & Strauss, 2008). In this study, once early categories were discovered, the researcher recruited additional individuals who could either corroborate existing patterns or provide opposing perspectives, ensuring a more complete comprehension of the investigated phenomenon.

2.5.3. Open Coding: The first phase, open coding, entails breaking down the data into smaller parts and carefully reviewing, comparing, and categorizing information based on important patterns (Corbin and Strauss, 2008). This step uses "indicators"—words, phrases, or assertions from the data—to generate early thoughts (Feeler, 2012). The goal of open coding is to detect and describe reoccurring patterns with descriptive codes (Kaiser & Presmeg, 2019).

2.5.4. Axial Coding: The second phase, axial coding, builds linkages between categories by connecting concepts to larger themes. According to Kaiser and Presmeg (2019), grounded theory necessitates incorporating changing interactions between various concepts into a central framework with a single core category (Feeler, 2012). LaRossa (2005) refers to this key category as the "main story" of the study, emphasizing its importance in theory creation. This stage guarantees that categories are interconnected, which aids in the creation of a coherent theoretical structure.

*2.5.5. Selective Coding***:** In the third phase, selective coding, the researcher refines and combines categories around the core category, systematically linking them to others (Strauss, 1987). The purpose of this phase is to determine the central phenomena that sums up the study's findings. LaRossa (2005) argues that a strong grounded theory must be reflective, consistent, and appealing, expressing the substance of the participants' experiences. Once the fundamental category is clearly established, the final grounded theory emerges, built directly from the raw data acquired, evaluated, and interpreted (Vollstedt 2015).

3. Results & Discussion

After the analysis, the core category that emerged was Highland Students' Resilience to Remote Learning. This category was derived from five essential themes:

Theme 1: Acceptance of a new learning modality
Theme 2: Autonomy in Learning
Theme 3: Access to adequate Infrastructures and supportive networks
Theme 4: Agency of Students
Theme 5: Aspirations to succeed

The inductive thematic analysis revealed key recurring themes that were then operationalized into research propositions. Hypotheses were subsequently derived and evaluated. Each theme is comprehensively discussed below.

3.1. Theme 1: Acceptance of a new learning modality

Students' narratives consistently revealed apprehension toward the shift to remote learning. Prior to the pandemic, highland students typically attended tertiary education on-site, often relocating to dormitories or urban areas. This transition promoted independence and provided better access to educational resources. However, the pandemic forced them to remain in their homes, disrupting their university experience and generating feelings of apprehension, fear, anxiety, and discomfort.

> *"My first impression impression is that, remote learning is "complicated" especially that we don't have the physical presence of the teacher in the Highland areas. I also have some confusions and questions if my understanding on questions, lessons and activities are already enough" (P1)*
> *"I have worries and fear if I could finish my degree" (P3)*
> *"At very first, I did not understand what would be the ways, how would I learn, what would be the means of communications with teachers and students and after the 1st week orientation I realized that it's very hard because it's all new to me. But, I have to adjust with the situation. (P5)*

These apprehensions align with Richardson et al. (2012), who found that students feel uncertain about their academic performance when faced with new learning environments. These emotions instigated the necessity to emotionally adjust to the new set-up.

> *"I felt alone with No one to consult/talk to, specially w/ academic struggles." (P8)*
> *"I chose printed module modality, and there is always loneliness and no one understands or can relate in their house. NO friends and classmates" (P3)*
> *"There is Less time for socialization, friends, and recreation" (P5)*
> *"I feel sad and lonely due to the absence of social interaction" (P3)*

The absence of in-person interactions exacerbated students' anxiety. Faced with the new modality, and the continued necessity for education, these highland students have no recourse but to engage in what McKenney & Long (2014) term "affective adaptation." This concept refers to a student's ability to consciously modify their emotional responses and attitudes in response to a novel educational environment.

Hypothesis 1:*Highland students harbor heightened apprehensions in engaging with remote learning*
Hypothesis 2:*Affective Adaptation is crucial when transitioning to a new learning modality*
Proposition 1: *Acceptance of a different learning modality through affective adaptation is needed to ease apprehensions*

3.2. Theme 2: Autonomy in Learning

The sudden shift to remote learning took a toll on the ability of highland students to learn independently. This aligns with the results of studies by Ahn (2020) and Simonson et al. (2019), which emphasized that students residing in remote areas typically lack the exposure and confidence necessary for independent learning. Narratives of the participants indicate that:

> *"Sometimes, no matter what I do, I can't seem to understand some lessons. I don't learn effectively when I can't see/hear the teacher. (P4)*
> *"Unlike face-to-face, in remote learning, no one explains to us. We can only do what we can. I feel like there is less retention due to the lack of someone to consult"*

While remote learning modalities such as distance education, online education, and flexible learning have been in use for several decades (Moore & Kearsley, 1996), their integration in the Philippines was relatively limited before the COVID-19 pandemic compared to other countries. This pre-pandemic limitation contributed to the challenges Filipino students faced in adapting to remote learning, particularly those in geographically isolated areas like the highlands. Learning from home exposed students to various contextual distractions—physical, social, and cultural—that further complicated the transition. Beyond the difficulty of adjusting to a new learning modality, additional internal (self-regulation) and external (environmental) distractions heightened their struggles in achieving autonomy in their learning process.

> *" There are times I find myself staring at a blank space. Not knowing what to do next. It's hard to manage my time and lack of focus in doing my school works due to home and school concerns mixing up" (P1)*
>
> *"Remote learning is hard, especially with so many distractions. The house sometimes gets very noisy. Sometimes, subjects have overlapping deadlines. Some activities were given in bulk, while other subjects also posted activities. (P2)*
>
> *"There are idle times specially when they only have to wait for announcements for synchronous classes and activities. It's hard to manage time because I just depend on when the teachers will post activities unlike face to face where there is really a schedule" (P8)*

The combined effects of difficulties to perform independent learning, distractions, completion of course works, and management of time may significantly hinder highland students' ability to take ownership of their own learning. While remote learning offers flexibility, it requires strong self-directed learning skills, including effective time management, organization, and the ability to manage distractions (Sung et al., 2011). However, these very skills are often underdeveloped in students transitioning to independent learning at home. Essentially, for highland students to smoothly integrate to the new modality, assuming autonomy to their own learning process is essential.

Hypothesis 3:*Highland students face challenges with learning on their own*
Hypothesis 4:*Difficulties with coursework organization and time management accompany highland students experience with remote learning*
Proposition 2*: Empowering autonomy for highland students enables them manage coursework and time*

3.3. Theme 3: Access to adequate Infrastructures and supportive networks

The very limited-to-zero internet access in the highlands impedes the learning experience of the students, including those who are participating in modular remote learning.

While some course materials might be provided in modules, further information and opportunities for deeper learning often require an internet connection. From the narratives shared, it can be gleaned that internet connection is a major concern.

> *"In my situation, my house is still far from where internet signal is available. I need to travel 7 kilometers away to avail the Peso-Net (Vendo-machine)" (P7)*
> *"It may difficult to us when there is an urgent activity to answer and we are in our place. We need to go to the far places that may cost us a lot of money just to answer single activity. sometimes we are late to be informed and late to pass the requirements. (P10)*
> *"Based on my personal experience remote learning has been difficult for me i have encountered many obstacles such as slow internet, sometimes i don't have money to buy load. (P9)*

The students' accounts expose a concerning deficiency in internet infrastructure in the highlands, highlighting the challenges they face in accessing online educational resources. Their narratives depict students traveling long distances to find an internet signal, with some having to visit family members or relatives in neighbouring municipalities or barangays. Due to the limited availability of internet networks and service providers in the highlands, students often rely on vendo machines and computer shops, which are also located far from their homes. This situation is further exacerbated by uncontrollable factors such as power interruptions and device malfunctions, which delay and hinder the completion of their coursework. Additionally, adverse weather conditions, such as heavy rains and storms, frequently expose them to hazards and risks."

> *"In our place, we always experience brown-out and sometimes it spans from an entire day to 2 days" (P6)*
> *"When it rains, I couldn't get the internet place. Worst is when there are power interruptions. To be honest I'm already very tired of this set-up. I feel like giving-up "(P7)*
> *"Our place becomes very muddy. And when it rains, my gadgets and other stuffs get wet." (*P8)

"Smith et al. (2019) emphasize the impact of geographic isolation on educational achievement, particularly in mountainous regions where access to resources and educational facilities is limited."

Hypothesis 5: *Availability and adequacy of technological infrastructures in the highlands posed a challenge to students learning remotely*
Proposition 3: *Technological infrastructure in the highlands must be tailored for remote learning.*

In addition to the need for sufficient technological infrastructure, strong social networks—including families, communities, and schools—are essential for the success of remote learning. Since remote learning is a relatively new approach, increasing societal awareness of its requirements and best practices is crucial. Successfully implementing and maximizing the benefits of this learning paradigm require the combined efforts of multiple stakeholders.

The literature review conducted by Andreassen and Dexter (2020) highlights the importance of supporting learning during the COVID-19 pandemic. Moreover, it emphasizes the role of parental involvement and a positive home environment in ensuring students' success in remote learning.

Some participants reported feeling judged by family members who questioned the amount of time they spent on the computer for online classes. Additionally, distractions such as household noise and responsibilities hindered their ability to focus and manage their time effectively. These findings align with Sung et al. (2011), who noted that the home environment can be a major source of distractions, including physical disruptions like noise or clutter. The emotional toll of witnessing family struggles at home added another layer of difficulty. The narratives are like:

> *"Sometimes, I am so down because there's just too much. My requirements are piling-up, with many family problems, and other aspects of life that I can't seem to understand. And I don't have anyone to air it out because people here can't relate and they don't understand what I am feeling specially that I'm the only one in our house with this type of set-up. I used to be living in a boarding house fo 7 years. So this is all new to me" (P5)*
>
> *"We have a Sari-sari store which I need to attend to and I also need to go to the signal place. Sometimes, my parents scold me saying that I always go out to the signal are" (P7)*

The student accounts not only emphasize the difficulties of remote learning, but also provide significant insights on strategies they employed for dealing with these issues. The accounts illustrate the significance of effective communication and negotiation skills for highland students to thrive in this environment. By effectively communicating their needs and circumstances to their families, students can foster understanding and collaboration. Negotiating household chores and academic workload becomes crucial for successful time management and reduces stress.

> *I tried to negotiate with my sister in doing household chores so that I can focus more in doing my activities. I made my parents understand that I'm a busy person who needs some space and time and sometimes they don't bother me and I'm so thankful for that maam." (P8)*.

Beyond the home environment, the community also plays a crucial role in supporting students. Informants' accounts suggest that communities serve as valuable sources of resources, with collaboration among stakeholders helping students navigate the challenges of remote learning. For instance, partnerships between schools and local government units (LGUs) facilitated the distribution of printed modules, ensuring that students in remote areas had access to instructional materials. Since it is difficult for schools to reach highland communities, LGUs helped distribute learning materials, with barangay offices serving as module drop-off centers.

> *"I consult and interview teachers in our community if I have confusions about how to make lesson plans. Also, I visit the DepEd school in our Baranggay when I need reference for my reports and lesson demonstrations."(P4)*

These findings affirm Littleton and Light's (2018) argument that community networks are vital in overcoming resource limitations and fostering learning opportunities in rural areas. Clearly, highland students benefit greatly from community support in the teaching-learning process. Schools, as another key network, provide critical support services. Unlike traditional face-to-face learning, remote learning requires additional interventions to compensate for the absence of on-campus activities. This is particularly important given the heightened susceptibility of highland students to mental health challenges in remote learning settings.

> *"In traditional learning, there are many activities that can help me cope. Like, if Im really stressed, I just go to the guidance office to seek advice. But now, If I have problems, I can't even contact my friends because I myself is also very occupied" (P8)*

In addition to support programs, ensuring academic continuity is equally important. Student narratives indicate that educational initiatives tailored for remote learners have played a crucial role in helping them persist despite the challenges of the pandemic. One of the most beneficial initiatives has been the provision of flexible learning modalities, allowing students to choose the format that best suits their needs.

> *"The university and instructor give us some option for us especially students who are dealing the remote learning such as letting us to choose pdf or printed modality."* (P4)

"Aside from the orientation, they let us choose the modality that we prefer. Also for our instructors, there is also a google classroom in which we can ask our questions, where we can send our queries and group chats"

Apart from academic initiatives, the encouragement, consideration, flexibility, and availability of instructors have greatly helped students adjust to remote learning. These qualities foster a nurturing and supportive learning environment that extends beyond content delivery. They also strengthen student-teacher relationships, which are crucial for engagement and successful integration into remote learning.

"Our teachers give sufficient for us to submit our requirements, and if there are late submission they would understand. Also, if we have confusions, we can chat them for clarifications". (P3)

"Reaching out to friends to brainstorm about difficult activities and to teachers for very hards topics" (P5)

"Being able to reach teacher through text messages" (P4)

"Even if its hard, they still prefer to have time to meet online so they can catch up." (P4)

"Instructors may consider the amount of workload for each subject (Overlapping deadlines) (P1)

Hypothesis 6:*Awareness and understanding of the family regarding remote learning set-up contributes in fostering a supportive home environment*
Hypothesis 7:*Highland student's experience of remote learning is significantly enhanced by the presence of a supportive community network*
Hypothesis 8:*School programs need to be responsive and accessible to highland students*
Proposition 4: *When familial, communal, and educational networks provide support, the implementation of remote learning for highland students may be facilitated.*

3.4. Theme 4: Agency in Learning

In addition to the need for autonomy and the access to technology and networks, the sense of agency is a key element in remote learning from the highlands. Agency as described by educational researchers, refers to ***"the ability to exert control over and give direction to one's life"***. (Biesta & Tedder, 2007, p. 134). It enables students to be active learners who make choices and take actions to fully participate in their own learning process.

Alongside agency, students must develop metacognitive skills, which serve as a foundation for self-regulated learning. Metacognition—often described as "thinking about thinking"—empowers students to set personalized learning goals relevant to their context. It also enables them to select learning strategies that align with their individual learning styles, monitor their progress, identify areas for improvement, and adapt to challenges.

The informants' narratives highlight how they applied metacognitive skills to improve self-directed learning. Students developed strategies to prioritize tasks, manage their time, and work independently. Some of their reflections include:

"I developed study strategies like waking up on dawn so no distractions to focus on classwork, and when the signal is good." (P6)

" In order to manage things, I strategize how to go the workload like reading everything offline and prepare all that needed for online task." (P1)

"I used strategies like downloading in phone but answering in laptop. And downloading activities in the shop and answering it at home." (P4)

"Downloading all activities, materials and resources in the shop and reading/answering them at the house." (P7)

"I realized that learning how to prioritize is very important, and I myself had to learn that. Doing the urgent first." (P5)

Aside from adopting metacognitive strategies, these highland students displayed resilience and problem-solving abilities, both of which are components of agency. When confronted with anxiety and stress, they developed coping mechanisms such as seeking social support and participating in activities to control their emotional well-being.

"*Finding ways to communicate w/ classmates and friends is very important." (P5)*

"Reach out to classmates" (P6)

"Finding other means of diversion to avoid breaking down emotionally (P5)

"Developing some diversion specially during times that were overwhelmed by course works" (P9)

In the pre-pandemic on-site setting, teachers' (who are physically present) provide optimum structure and guidance including the scheduling of time, and the management of academic tasks. However, for students in geographically isolated areas, remote learning can feel more isolated, hence, a higher degree of agency is a necessity. This is supported by what Yoder, N., & Hodson, C. (2015) posited, fostering metacognition in online and remote learning settings is important to enhance student self-regulation and learning outcomes. The student narratives exemplify self-regulation through identifying challenges (stress/anxiety) and implementing coping strategies.

Aside from developing metacognitive strategies towards self-directness', the remote learning set-up necessitated them to adjust their financial strategies in consideration to the unique needs of their context. Along this discussion on financial strategies, one strategy these students learned is to budget.

"In remote learning, we always need to buy load because we always have deadlines and the thing is, most of the times, I don't have money because I'm not given allowance anymore" (P2)

"Sometimes, its expensive because of the need for load" (P1)

"Considering my situation, I learned to do budgeting specially for load and materials that will be needed for my requirements". (P4)

Despite financial constraints, the students' narratives reveal remarkable resilience and resourcefulness. This reflects the idea that "necessity breeds invention." When faced with difficulties, people often develop creative solutions. The need to adjust their financial strategies pushed these highland students to find ways to alleviate their financial burdens. Some took advantage of the remote learning setup to find employment or alternative means of generating income.

Hypothesis 9:*Developing Metacognitive skills enable highland students to self-regulate their learning*
Hypothesis 10: *Highland students engaged in remote learning may require adjustments their financial strategies*
Proposition 5: *Metacognitive and financial empowerment enable Highland students to navigate the challenges of remote learning*

Theme 5: Aspirations to Succeed

While highland students faced numerous challenges in remote learning, a key factor that enabled them to persist and adapt was their strong aspiration to succeed. Their determination to complete their education kept them motivated despite the difficulties they encountered. This aligns with Goal Theory (Locke & Latham, 2002), which highlights how setting specific, challenging, and achievable goals enhances motivation. Similarly, Goal-Orientation Theory (Elliot, 1999) explains how the goals students set for themselves shape their learning behaviors and drive their persistence.

" Despite the difficulties and even if I'm overwhelmed, I reminded myself to continue head-on, and persist for my future." (P6)
"I remained optimistic, be driven by my goals, and focus on my dreams (P3)
"I just set my mind on my goals because If I don't, I'm not sure If I can make it. (P7)

No matter how difficult their experiences were, their focus on personal aspirations helped them push through obstacles. Their persistence, fueled by their educational goals, consistently emerged as a defining theme in their narratives. By maintaining a clear vision of their future, they found the strength to navigate and overcome the challenges of remote learning.

Hypothesis 11:*Adopting a goal-oriented approach fosters persistence and motivation driving their academic pursuits.*
Proposition 6:*Focusing on goals and aspirations propels highland students to continue to persist*

Theory Generation: The Geographic Resilience in Education Theory

The need to ensure continued educational delivery in the time of COVID-19 pandemic birthed the development of innovative educational interventions such as Remote Learning. While this modality has demonstrably been effective and is user-friendly in urban and metropolitan environments, the same cannot be said for students residing in highland areas.

This study on the remote learning experiences of highland students uncovered a core theme of Geographic Resilience in Education. The participants' narratives revealed a multifaceted process that highland students undergo in this educational setting: acceptance of a new modality, taking autonomy of their own learning, gaining access to Infrastructures and networks, developing agency, and focusing on their aspirations to succeed.

Students from the highlands face unique contextual challenges – limited access to technology, infrastructure limitations, and often, a lack of prior exposure to remote learning methodologies. Despite these difficulties, many students demonstrate a remarkable capacity to **adapt and persist**—a phenomenon that underscores their resilience in the face of educational barriers. This emerging theme of **resilience** serves as the foundation for the Geographic Resilience in Education (GRE) Theory (Figure 3), a conceptual framework that explains how geographically isolated students navigate and overcome the challenges of remote learning.

When compared to existing theories of educational resilience, such as Martin and Marsh's (2006) Academic Resilience Model, which emphasizes motivation, confidence, and control, GRET adds a geographical dimension by contextualizing resilience within remote and resource-constrained learning environments. Similarly, while Bronfenbrenner's Ecological Systems Theory (1979) highlights the role of environmental factors in learning, EGRT specifically addresses the interplay between.

The Geographic Resilience in Education framework consists of five interrelated themes that collectively shape students' ability to succeed. The process begins with acceptance of a new learning modality (Theme 1), where students acknowledge and adapt to the shift from traditional face-to-face education to remote learning. This acceptance serves as a crucial stepping stone toward developing autonomy in learning (Theme 2)—the ability to take ownership of one's education, manage time effectively, and engage in self-directed learning. However, autonomy alone is insufficient. External support systems (Theme 3), such as access to technology and strong family, school, and community networks, play a critical role in sustaining students' engagement. These support structures provide the necessary resources and encouragement that enable students to persist despite logistical and technological limitations.

With a foundation of acceptance, autonomy, and external support, students are empowered to cultivate their sense of agency (Theme 4)—the ability to actively shape their learning experiences, make decisions, and develop strategies to navigate obstacles. Finally, this agency is reinforced by students' aspirations to succeed (Theme 5), which serve as a driving force that sustains motivation and perseverance. The synergistic interaction of these five

themes—where acceptance fosters autonomy, which is strengthened by external support, enabling agency, and ultimately reinforcing aspirations—culminates in the realization of Geographic Resilience in Education among highland students.

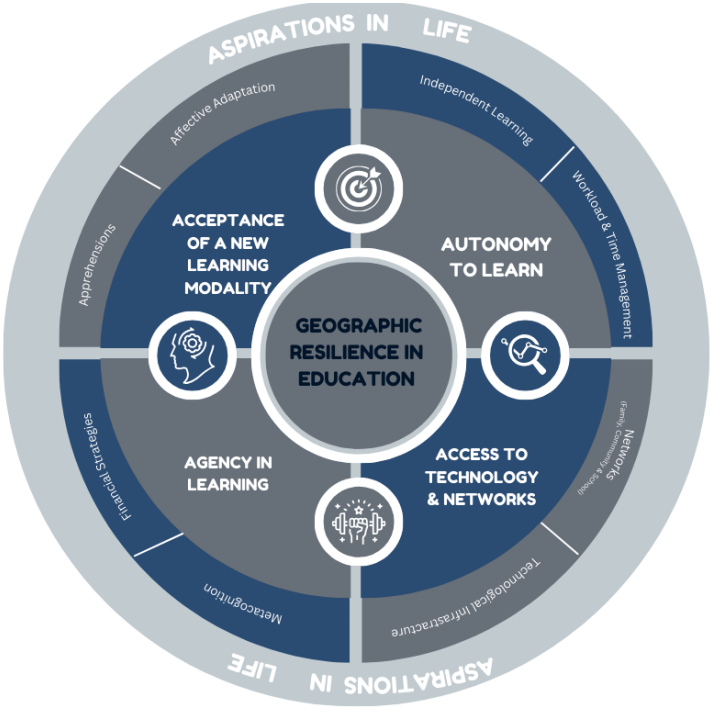

Figure 3: Conceptual Model of Alugar's 5As of Geographic Resilience in Education

4. Conclusion

In times of force majeure or crisis, disparities in access to and quality of education tend to widen, particularly for students in geographically remote and isolated areas. While resilience in the face of adversity is a widely acknowledged human strength, fostering Educational Geographic Resilience among highland students requires a structured and holistic approach. The Geographic Resilience in Education Theory (GRET), proposed by Alugar (2024), provides a systematic approach to understand and address these challenges. This 5A's framework—comprising Acceptance, Autonomy, Access, Agency, and Aspirations—outlines the key factors that contribute to the development of resilience among students facing geographic barriers in education.

Beyond its immediate application to highland students, the Geographic Resilience in Education Theory holds broader significance for students in other geographically isolated, rural, and underserved contexts. While the specific challenges—such as topography, infrastructure, and cultural norms—may vary, the core principles of EGRT remain universal. The dynamic interaction of its five themes provides a foundation for educational institutions and leaders to

design responsive policies, learner-centered curricula, and innovative programs that cater to the unique needs of students in remote learning environments.

Furthermore, GRET emphasizes the crucial role of collaboration among various stakeholders—including educational institutions, local communities, families, and students themselves—in co-creating initiatives that ensure equitable and empowering remote learning experiences. By fostering a deeper understanding of how resilience is cultivated and sustained in challenging learning environments, GRET not only informs educational strategies but also strengthens the collective effort to bridge educational gaps, promote inclusivity, and ultimately improve the implementation of remote learning. Through this collaborative approach, we can create learning environments where students—regardless of their geographic location—are empowered to thrive, persist, and achieve their aspirations.

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Declaration of Conflicting Interests and Ethics

The authors declare no conflict of interest. The study adhered to the ethical requirements of the university. *S*ince there is human participation all ethical guidelines on the Data Privacy Act were followed and issues raised by the participating students will be addressed appropriately. The researchers explained important details such as the objectives and methodology of the study to the participants. Informed Consent forms were given to signify who will voluntarily participate in the study. The names of the students were not revealed to provide anonymity and confidentiality. The in-depth interviews conducted were facilitated with utmost care.

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