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Digital natives: A case study exploring the digital literacy gaps in a Rural High School

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Abstract
Purpose: The main purpose of this study was to have an in-depth exploration of rural students' digital literacy in the 21st century.
Research methodology: This research employed a case type of study, which explored the digital literacy of four (4) rural high school students in San Pablo City. Participants were selected through purposive sampling with researcher-made criteria. They were interviewed using a semi-structured interview via Google Meet. A thematic analysis was used to further understand their digital literacy.
Results: Their digital literacy skills appeared to be needing improvements. Different factors were also mentioned to affect their digital literacy including their geographical locations, personal factors, and their limits to access the internet and the technology. However, they still incorporated help-seeking and self-studying to improve their digital literacy.
Conclusions: This study showed that the students still experience struggles in terms of the accessibility of the internet at their location. These results could help as a basis for what support must rural students get to further develop the necessary digital skills for their academic and future success.
Limitations: The students' grade levels were not specified. Specific students with different grade levels could have different findings.
Contribution: This research uncovered the challenges, skills, and solutions to problems that included the students' digital literacy in rural areas. This could be beneficial to students in a rural area as a basis for the improvement of their digital literacy.

Keywords: *rural school, digital literacy, digital challenges, 21st-century technology, rural high school students*

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1. Introduction

Digital literacy, the ability to access, evaluate, and use digital information effectively, has been increasingly recognized as a vital skill for academic success and future career opportunities (Samane-Cutipa, Quispe-Quispe, Talavera-Mendoza, & Limaymanta, 2022). Digital literacy is achieved when a learner utilizes the information from the internet from different kinds of sources efficiently (Buckingham, 2015). This means that learners in the 21st century must be digitally literate to cope with the continuous technology change. However, disparities in access to technology and digital resources persist, particularly in the context of rural high schools. Due to their geographical location, their access to the internet becomes limited, making it more difficult for them to comply with activities and homework (Kormos & Wisdom, 2021). In addition, because of some negative connotations about rural

schools, fewer teachers seem to want to teach there (Handal, Watson, Petocz, & Maher, 2018). This is one of the reasons why rural students may be far behind when it comes to digital learning.

Digital natives are individuals who have grown up surrounded by technology. These individuals naturally adapt to digital learning and interactivity with the technology (Crist, 2017). Concept, although it is widely argued that it is a persistent myth lacking empirical evidence in accordance to the relationship in digital media learning, some still say that digital natives still exhibit higher brain activities that may lead to diminished empathy, social and intrapersonal relations, and as well as communication skills (Janschitz & Penker, 2022). However, just like in other countries, although more people are still referred to as digital natives, the digital divide still exists (Ben Youssef, Dahmani, & Ragni, 2022).

Along with the global rapid advancement of the internet and technology, disparities in the adoption of it arise as well, causing a digital divide (Viard & Economides, 2009). People from rural areas and schools have scored poorly in internet bandwidth and other digital inclusion, specifically in digital literacy (Adam & Dzang Alhassan, 2021). With this, it is said that some educational policies including digital literacy must be integrated more as it also provides teachers and students with digital skills that can be utilized in classes (Samane-Cutipa et al., 2022). Schools that include and promote digital inclusions in classes tend to have more flexible information and a wider range of sources. This is why bridging the gaps in rural school areas could help in terms of making the technology accessible in those where it is not.

In the Philippines, there has been a challenge in terms of adapting to the advancement of technology for the past few years. It is also one of the countries that has implemented a K-12 education system, particularly the subjects that may need to include the use of technology like ICT. Digital gaps in a classroom setting hinder the students' capacity to adapt to the technology that is also part of the curriculum. Back in the time of the pandemic, some of the students in the Philippines chose the print modality rather than taking online classes because of digital exclusion, poor technology management, and other digital barriers (Agaton & Cueto, 2021). When talking about the inclusivity of technology in schools, it is crucial to know how digitally literate not just the teachers are, but especially the students.

In the present time, some schools are slowly adapting to the technology. In terms of rural areas, there are few studies that explore the inclusion of digital learning in local rural schools. Still, the digital literacy of the students from rural areas is classified as a "beginner" compared to students from urban areas. Although there has been progress in adapting technology in rural areas, teachers still hope for more accessible materials in terms of shaping their digital literacy with the use of technology (Bahri, Jamaluddin, & Saparuddin, 2022).

Due to the different challenges faced by the students, their communication and research skills as well as their confidence are affected (Abbas, Aman, Nurunnabi, & Bano, 2019). Moreover, students in rural areas belong to families with low incomes. Thus, attaining internet data remains expensive and less affordable even though it is effective specifically in online learning. This worsened when the pandemic started as more people lost their jobs (Gocotano, Jerodiaz, Banggay, Nasibog, & Go, 2021). This may have affected their readiness for their future careers, given that most jobs require or at least have an ICT component. Less exposure to technology and digital knowledge may make them less ready for what may come in the future. Moreover, even though ICT has been a part of the K-12 curriculum since 2013, it has not yet received the focus it deserves (Deped, 2019).

Thus, the researchers conducted this study to further explore the challenges and the experiences of the students in rural schools in digital literacy. Since most of the studies explore how rural students still lack the materials and the knowledge of the technology, the results of this study could be used as a basis for the enhancement of the digital literacy of the students particularly in rural areas. Additionally, this study proposes different learning materials like manuals and handouts for the improvement of digital and technical skills for the students that they could utilize to help them cope with the different digital challenges they could be experiencing.

2. Literature Review

2.1 Elements of Digital Literacy

Eight components make up digital literacy: the Cognitive component, which deals with using platforms and software; the Construction component, which involves remixing and reusing already-existing resources from the internet; the Cultural component, which discusses applying technology in various contexts; the Communicative component, which measures people's awareness of using various communication devices; the Creative component, which evaluates how people create digital content for others; the Critical component, which discusses searching for information effectively and separating reliable sources from unreliable ones; and the Civic component, which is the final component, which includes how they practice their digital rights and responsibilities as well as their part in the society in accordance with their use of technology (Belshaw, 2016).

These elements of digital literacy are important because each component is applicable in school for basic computer skills, media literacy, communication through the internet, and the use of educational resources. However, Ala-Mutka (2021) noted that digital literacy as a typical definition, makes the concepts overlap considerably. By analyzing the ideas, principles, and parts constituting digital literacy, it is understood that digital literacy means the ability to use digital technology, communication devices, and network in digital environments to live life efficiently (Phuapan, Viriyavejakul, & Pimdee, 2015). In relation to the present study, these elements of digital literacy were observed among the participants to see how digitally literate they were when utilizing the information obtained from the web. These elements of digital literacy show the many aspects that can be used for any given situation within the digital aspect, and these elements of digital literacy also show how each individual can exercise their digital literacy skills and knowledge with the help of these elements to their fullest extent in the digital world.

2.2 Digital Literacy in the Philippines

Digital abilities have become increasingly more important in recent years, crucial for daily life and the job. As such, the Philippines, like many other nations, has implemented digital literacy frameworks in basic education. However, the country falls short in ASEAN in almost all ICT competencies recommended by the Union for International Telecommunication. The digital literacy of Filipinos, particularly the very old and young, requires significant improvement (Law, Woo, De la Torre, & Wong, 2018). According to the Director of the Information and Communications Technology Service of the Department of Education, empowering the students with ICT will prepare them for the adjustments in terms of continuous developments, which will enhance their digital literacy (Deped, 2019).

Despite that plan, the distribution of ICT devices has not progressed (OpenGov, 2024). Additionally, even though the Philippines is one of the countries with top users of social media, only 6% of individuals ages 15 and above have basic internet skills, and only 2% possess standard digital skills (Dy, 2022). This indicates that the digital literacy of Filipinos is still dismal and remains insufficient. On the other hand, another study by the Southeast Asian Ministers of Education Organization (SAMEO) (SAMEO, 2021) said that their study found that Filipino students were competent in the Department of Education (DepEd) programs that promote technology skills. But, with more effort, they could become more responsible digital citizens. The digital literacy of Filipinos is not yet fully improved as the studies say. With the help of the government, especially in implementing a more effective curriculum for ICT, it could be enhanced more.

Meanwhile, a study by Baron (2023) indicated that using new technological trends in the education system allows students to bring their skills and competencies to the technology for the better. It was also said that the Blackboard System, which provides a virtual dimension that gives the students both classroom and online learning opportunities, is a more effective approach than using the traditional lecture technique.

2.3 The Context of Rural Schools in the Philippines

Along with the need for digital knowledge, there is a growing demand for tools and appliances as means for technology access. According to Tembrevilla (2020), barangays are considered rural if it has a population count of less than 5,000, no town hall or province capitol, landline telephone system or calling station, and no cellular phone signal. With the aforementioned features' absence, rural schools face difficulties with their education having no additional support and tools. Education in rural schools struggles to develop considering that in the 21st century, technology is heavily used. Rural schools lack the means of access to technology, such as appliances and gadgets, especially internet connection, making it hard for both the teachers and students to adapt to new standards.

Rural schools also face challenges such as low enrollment and high drop-out rates due to poverty. Additionally, rural schools also tend to lack qualified teachers as most of them teach in densely populated urban areas where technology can easily be accessed at their own convenience**.** Additionally, education inequality is more prevalent in rural areas than in urban areas. Likewise, countries with high income inequality, such as the Philippines, also possess high education inequality (Zamora & Dorado, 2015) because rural high schools lack facilities, and resources, and have low socio-economic factors (Arcilla, n.d.).

2.4 Challenges and Benefits of Rural Schools

With the growing use of technology in today's world, so does its impact on students' literacy through digital tools and technology. Although the current generation is thought of as "digital natives," there are differences in the types and levels of digital literacy among them (Chan, 2024). It is believed that integrating digital technology into the classroom will help both educators and students learn and teach more effectively. However, one of the primary obstacles to successful learning is the lack of access and resources (Bingimlas, 2019). It is also said much differently when it comes to rural high school student's education, especially when it comes to their digital literacy skills. According to a study, poverty was the main issue that respondents faced, and the majority of respondents for the study were from rural areas. Therefore, to prevent students from becoming reluctant about attending school, it was highly advised that the government establish senior high school programs close to their homes and provide the necessary subsidies, such as food, school supplies, medication, and clothing (Bayron, 2023). In addition, a few students reported that it was very challenging to understand the relevance and intent of the data and materials they encountered on the internet (Mudra, 2020). Considering that now, the digital literacy of the student is a challenge when it comes to perceiving the given data from sources on the web.

Since the pandemic occurred, the inclusion of technology in education has been relevant. In recent times, new technologies and education have continued to develop together in a classroom setting (K. Caratiquit & Pablo, 2021). Another study indicated that their research findings suggested that there is room for more use of digital tools and literacy texts in and outside of the classroom. Among their recommendations was to help rural high school students become digitally literate by giving them more opportunities to use new tools in the classroom and by encouraging teachers to use a range of print and digital literary texts (Wilson, Briere, & Nahachewsky, 2015). In context, even if the students are not used to the usage of digital devices for utilizing data for their education, it shows potential for heightened usage of digital technologies for better use. As stated, students who are digitally literate have greater opportunities and are more competitive in today's digital world (Baterna, Mina, & Rogayan Jr, 2020). Therefore, rural high schools sometimes lack the digital literacy needed for education, as they sometimes lack the resources needed in order to use the said skills in education. In addition, rural high school students also sometimes lack the digital literacy required to utilize information from the web, but it also shows potential for prolonged use of digital technologies for academic purposes.

2.5 Students' Coping Strategies

It is clear that digital literacy skills in rural high school education consist of many challenges, and these challenges consist of the coping strategies of the students who are attempting to utilize information gained from the web for academic purposes. To succeed in the 21st century, students must possess media literacy, knowledge, learning skills, and life skills. The school curriculum incorporates the use of technology tools and tactics to provide teaching and learning strategies for students to help them

acquire these abilities. Students' lack of digital literacy makes it difficult for them to cope with their studies in the digital learning environment. The results demonstrated that the teaching and learning strategies required for special needs students (SNS) in the digital environment may be enhanced by the digital literacy skills model (Tohara, Shuhidan, Bahry, & Nordin, 2021).

Two types of interaction patterns that enhance the students' literacy are: first, one-way interactions, in which teachers act as facilitators, correctors, and evaluations during literacy activities; second, multi-directional way, which emphasizes interactions between the teachers and the students. These two ways can engage the students in various interactions that can improve their way of conveying information, concepts, and ideas (Rafid & Khotimah, 2021).

Another study indicated that the results of their research showed that MyELT courses, a web-based learning management system, were advantageous in that they were flexible enough to help complete the requirements of General Education courses while also improving students' digital literacy and English proficiency in proportion. The study was about examining the benefits of incorporating online courses, MyELT, for General English (GE) curricula and to investigate the challenges that negatively affect the expediency of the courses in improving the students' English proficiency and digital literacy (Sha'ar, Buddharat, & Sınghasuwan, 2022). Therefore, students sometimes lack the coping mechanism for their challenges in digital literacy needed for education, but results show that students can cope with challenges in digital literacy with the help of some strategies.

2.6 Synthesis

One's digital literacy can be measured with its eight critical components, which are: Cognitive, Construction, Cultural, Communicative, Creative, Critical, Civic, and Cognitive elements, which define the digital skills necessary especially for our modern life (Belshaw, 2016). These components could be a basis to tell the students digital literacy is essential in their daily living, especially in an educational context. These are necessary for attaining basic computer skills, media literacy, effective communication, and the use of educational resources (Ala-Mutka, 2021; Phuapan et al., 2015). These components play a crucial role in shaping the students' digital literacy. Without one, their overall digital literacy might appear to still need to be polished or improved.

Meanwhile, in the Philippines, digital literacy is increasingly crucial as the country slowly adapts to more advanced technologies. However, the country still lags behind other ASEAN nations in ICT competencies (Law et al., 2018). Despite the government's efforts to empower students with ICT, gaps remain, making only a small population of them possess basic or standard digital skills (Dy, 2022). This shows that the government needs to address this kind of problem to improve the students in the country with their digital literacy. Although the Blackboard System is a choice as an alternative way to include the use of technology in classes, the government still has to make sure that every student will have access to such.

The literature also mentioned the lack of infrastructure and technology in rural areas as reasons why most students from rural areas often experience struggles in attaining adequate educational resources, failing to adapt to the new digital standards. Other aspects such as poverty, low enrollment high dropout rates, and lack of qualified teachers in rural schools add to the educational inequalities in schools (Arcilla, n.d.; Tembrevilla, 2020; Zamora & Dorado, 2015).

Digital integration into rural schools presents both challenges and opportunities to the students and teachers. While digital tools enhance their learning capabilities, access to these resources often lacking, slowing down their development of digital literacy skills (Bingimlas, 2019). To cope, rural students and educators employ various strategies such as incorporating technology into the curriculum that can enhance their learning outcomes and digital literacy (Tohara et al., 2021). This indicates that with proper strategies and support from the government, students and teachers can overcome the barriers to digital literacy.

Upon reviewing different literature, the researchers found out that while students may exhibit technological skills, barriers such as poor infrastructures, poverty, and lack of resources impede their ability to fully develop their digital literacy. To bridge the gaps in their digital literacy, the government must provide them with support and tools effective in the curriculum. With that, the students' digital competencies could be enhanced for their readiness for the digital age.

3. Methodology

3.1 Research Design

This research used a qualitative design to provide a thorough grasp of a "case" or confined system posed in this study– to explore and investigate further the digital literacy of rural high school students in the 21st century. Specifically, a case study approach was employed in this study since there was a need for empirical investigation to look at an issue in its actual setting (Yin, 2009). Data-gathering was done in the form of an interview to ensure a thorough examination of a case. The participants were interviewed online through an online meeting site. The interview proper was recorded with the participants' permission. Consequently, this approach was aligned with the objectives of this study to have an in-depth exploration of rural students' digital literacy in the 21st century.

3.2 Research Instrument

To attain the data needed for the research, the researchers utilized a semi-structured interview. This approach allowed the researchers to gain a better understanding of the participants' answers from the interview and to provide the participants the ability to freely answer any open-ended questions by the researchers. In addition, the data obtained from the interview was recorded and transcribed for future use.

Additionally, the content of the interview underwent content validation by a teacher with expertise in research subjects to ensure its reliability and relevance. Suggestions and revisions of the questions based on the studies' context were taken into consideration.

3.3 Sampling Method

The participants were selected through purposive sampling through a criteria developed by the researchers. A non-probability sampling method called purposive sampling selects participants based on traits that meet predetermined criteria (Campbell et al., 2020). Purposive sampling aims to help answer research questions by focusing on particular characteristics of a population that are of interest (Rai & Thapa, 2015). For this study, participants: (1) must be a junior high school student from the 7th grade to 10th grade; (2) must be studying in a rural school; and (3) must have an ICT subject. Students with an ICT subject were chosen due to them having an idea and connection to digital literacy, which aligns with the study at hand.

3.4 Data Analysis

The researchers utilized a thematic data analysis in this study. The utilization of this type of data analysis allowed the researchers to gather information based on the answers of the participants in the research questions prepared, which were also arranged on themes that might focus more on their experiences and opinions. With this type of data analysis, new insights and concepts could be derived from the responses of the participants involved in the study (McLeod, 2024).

3.5 Ethical Considerations

The participants were informed regarding the details of the study and were not forced to participate in the study. Permission to take audio recordings during the interview was also asked. Their identity remained confidential and anonymous, and no potential harm risk was observed throughout the study.

4. Results and Discussions

4.1. What are the digital literacy skills and competencies among the students in rural high schools?

Theme 1: Rural school students have technological competency in terms of using different devices and software for communication purposes.

It was observed during the interview that students from the rural high school were competent when it comes to using different devices and software for different purposes mainly for communication.

Participant A: "Nagagamit po 'yong mga device kapag kailangan po natin makipagusap sa mga taong nasa malayo sa atin, kapag kailangan po natin makipagchat, ayun po." (I use those devices if I need to talk to people who are far away from us.)

Participant B: "Gano'n din po, Messenger at Facebook. Minsan din po Instagram, tapos dun po nakikipag-usap, gano'n po." (It's the same with Messenger and Facebook. Sometimes Instagram too, and that's where we communicate.)

Participant C: "Nagagamit ko po 'yong internet, for communication pag gamit po ng iba't-ibang apps or social media like Google na nakakatulong po sakin sa pagkuha ng iba't-ibang articles for research po." (I get to use the internet for communication using other apps or social media like Google that helps me when getting other articles for research.)

The findings observed above were aligned with Belshaw's Eight Elements of Digital Literacy (2016), more specifically the cultural and communicative component. This specific component is usually observed when students communicate, socialize, or share with each other various information and/or cultural norms. The cultural component is when a certain user becomes a part of an online community, such as using Facebook to connect with other people around the world.

According to Ala-Mutka (2021), the economy and society are using technologies more and more, which is changing a variety of aspects of daily life, including working, learning, communicating, and getting information. It has also been stated that it is important to be competent when utilizing technology, to utilize the important information or benefits that may hold within it.

Finally, this suggests or implies that rural high school students were also technologically competent when using it for communication, as they showed that they could utilize applications online such as Messenger, Facebook, and Instagram to communicate or to connect with people close to them. When utilizing these applications, not only were the students able to connect with other students, but they were also able to chat or converse with other people which could aid them when it comes to education or communication in general. With the profound knowledge about using the applications online, the students were able to foster a sense of being technologically competent at communication on the internet.

Theme 2: The digital literacy of the students is focused on gathering and utilizing information from the internet specifically for educational purposes.
Whenever students use the internet, they mostly use it to get information to aid them in school. Utilizing information gained from the web in a school setting is a big help because students can use it whenever they need it, and they can utilize the information around the web for education.

Participant B: "Alam ko po kung saan ako magsesearch ng mga kung ano-ano, san po ako pupunta kapag kailangan ko pong maghanap ng kung ano-ano sa internet." (I know where to search for things, where to go if I need to find anything on the internet.)

Participant D: "Ito po 'yong sagot ko sa kanina gadgets at internet ay napakahalaga para sa academics upang madaling po maaccess ang malawak na bilang ng mga mapagkukunan at impormasyon, tulad po ng mga aklat, journal articles, at online lectures na maaaring makatulong sa pananaliksik at pag-aaral." (This is my answer a while back on gadgets and the internet is very important in academics, so that it can be easier to access the information, like books, journal articles, and online lectures that can help in research and studying.)

The findings from the interview above indicated that Belshaw's Eight Elements of Digital Literacy is being observed, alongside the cognitive and critical components. The cognitive component can be

observed when students can use the information obtained from the web for educational purposes. On the other hand, a critical component is observed when students can use the web search effectively when using it for educational purposes. These components allow the students to effectively use the web engine for educational purposes.

For instance, in this era of technology, artificial intelligence (AI) can be perceived by people as a helpful tool for students to use in their studies. However, if it is used inappropriately, it can lead to academic dishonesty. This is why a proper introduction to AI on using it ethically and effectively could help the students be engaged and keep up with the digital age (K. D. Caratiquit & Caratiquit, 2023).

Finally, the findings imply that the students could gather and utilize information from the web for educational purposes, allowing it to be an essential tool for educational growth. The students also said that the information that they gathered from the web helped them in their research. Additionally, the students also valued the devices and the internet for making it possible for them to search the web for the information they needed at a certain task. Lastly, it can also be said that the students valued the internet and gadgets because they were able to aid the students when searching for information that was not physically available to them. As the student progressively uses the skills necessary for gathering and utilizing information, they are able to effectively use the information for future usage productively.

4.2: What are the challenges faced by the students when it comes to the skills involving technology in the 21st century?

Theme 1: Rural school students still encounter problems regarding where they can get trusted and credible information.

In an educational setting, finding and using credible information from trusted sources is a must. According to Ahmad and Jan (2018), the credibility of information must be considered before using it or before conducting research at any level. This applies to both urban and rural areas, with emphasis on the latter. The findings above stated that rural high school students still had difficulties in acquiring information due to the lack of sources and skills in judging whether a source was credible or not.

Participant A: "'Yong research po kasi minsan po ay hindi po accurate 'yong mga nalabas, lalo na po 'yong mga websites na may bayad, at mahirap pong makahanap ng websites na mas maraming information. "(Sometimes, the results of what I search are not accurate. It's difficult to find websites with more information, especially the paid ones.)

According to Belshaw (2016), digital literacy has a component named the critical component, which aligns with the findings above. Rural high school students struggled to separate accurate and inaccurate information. This was due to their limited internet connection which hindered them from exploring online resources effectively and increased their vulnerability to misinformation. Unlike urban areas which have access to high-speed internet and vast digital libraries, rural areas often make use of only little to no connection, along with outdated technology. The lack of sources with information and websites with fees also contributed to the difficulties as stated by a participant.

The findings above were aligned with the findings of Silvhiany, Huzaifah, and Ismet (2021) which stated that students often lack awareness in judging the credibility of information and who is behind it. Furthermore, their study also stated that many students also skipped questioning the author and mainly focused on the content only.

This implies that students normally lack awareness regarding information online, with rural students having more difficulties because of their underdeveloped digital literacy due to the lack of resources. Some do have sufficient resources; however, they also lack awareness and fail to question every element before using the data. The findings also suggested that along with poor judgment skills, rural students also suffered from the insufficiency of reliable sources. There are more websites on the internet containing inaccurate information, while reliable ones are often restricted by paywalls, making it difficult for students to access accurate information online.

Theme 2: Students struggle with learning other digital skills due to personal factors and loss of internet connection.
Digital skills play a significant role in everyday life today, and in turn, daily life greatly contributes to the development of digital literacy. Many factors affect the level of digital literacy, especially personal factors. According to Shopova (2014), digital literacy and skills of students play a key role in their learning and the development of these is crucial for improving the effectiveness and efficiency of the learning process as well as for the adaptation of students to the rapidly changing labor market.

This study revealed that students, particularly those who studied at rural high schools, struggled to explore the internet and learn other digital skills due to personal factors, and the lack/loss of internet connection. The personal factors mentioned were financial problems, lack of devices, loss of signal due to their location, brownouts/blackouts, and other non-educational activities, such as chores, that consumed the time that could be used for studying. The main factor that prevented the participants from using the internet was the loss or lack of connection to the internet. Rural students did have coping methods to counter these factors, such as relocating to different areas with signals and buying prepaid loads.

Participant C: ¨May times po na hindi ako nakakagamit ng internet gawa po ng pagkakaroon ng losses of connection po ganon nagagawan ko po siya ng paraan sa pamamagitan ng paghahanap ng pwesto na may signal or kokonek nalang po sa wifi.¨ (¨There are times when I can't access the internet because of my loss of connection, though I manage to connect again by relocating to places with signal, or by connecting to the wifi.¨)

The findings above corresponded with the study of Peng and Yu (2022), which stated that socio-economic status is one of the factors that affect digital literacy. Their study showed that children from families with high socio-economic status tend to have greater digital literacy and skills compared to those of families with low socio-economic status. According to Kimble-Hill et al. (2020), students have difficulties in accessing lessons. This leads them to understand ineffectively due to the limited access to the internet, further supporting the findings of this study.

This implies that sufficiency of connection to the internet, and devices, are basic need and is required to have excellent digital literacy. However, these factors are not present at all times in some households, especially in those in rural areas. Rural areas tend to have lower socio-economic status and less infrastructure, which makes internet availability quite scarcer than urban areas. This leads to lower availability of access to the internet, which further results in its citizens having less knowledge about the technology and internet, making their digital literacy inferior to that of urban dwellers.

Theme 3: Rural school students experience challenges related to their productivity in acquiring digital skills that may affect their academic performance.

Students in rural schools encounter significant challenges while trying to learn digital skills, which negatively impacts their performance in school. One of the challenges they encountered was the result of being unproductive when using technologies or the internet. According to a study by Sukor and Razak (2023), children and adolescents are more likely to be unproductive, preferring to use electronic gadgets while sitting or lying down for extended periods of time. This is one of the negative impacts that technology can bring, and it can even affect students' academic performance.

This study revealed some of the challenges that students faced when using technology that is related to this theme. One of the participants had a similar challenge regarding this.

Participant 4: "Nakakaapekto po ito ng pagka-adik kasi po labis na po ang paggamit natin ng internet na maaaring magdulot ng mababang produktibidad sa iba't ibang aspeto po ng buhay natin." (Too much use of the Internet may cause addiction and can result to low productivity in other aspects of our lives)

The response of Participant 4 revealed that unproductivity was one of the challenges they encountered when using technology or the internet. The use of the internet may cause addiction if it is not handled properly and can result in unproductivity that may affect academic performance.

The findings above contradicted the findings of Kazim and Abrar (2011, as cited in Jalali, Khazaei, Paveh, Hayrani, and Menati (2020). According to them, lack of sleep causes students to react and interact with their performance right away, leading to anxiety, dizziness, and unproductiveness, but those factors have no effect on their performance in school. This means that unproductiveness like sleep deprivation has no direct effect on the students' academic performance. However, the study of Kandemir (2024) supports the present findings. Students who are unproductive may reduce learning motivation and thus increase their procrastination in school.

This implies that students face challenges in terms of their productivity when using digital media. Challenges like this may result in poor academic performance of students. A possible cause of unproductivity is because of addiction when technology and internet use are excessive. It is suggested that challenges like this need to be addressed and find a solution to prevent the negative effects on students' academic performance.

4.3 What are the coping strategies of the students when faced with challenges in terms of digital literacy?

Identifying the coping strategies students may use is essential when they are faced with challenges in terms of digital literacy. Students who are faced with these challenges find ways to cope or adapt to using technology which requires digital skills to be able to use it. The results from the interview were collected to identify the various coping strategies that students used in terms of their challenges in digital literacy. Knowing this will further help other students to cope with their struggles in using technology.

Theme 1: Utilizing tools and assistance helps overcome digital challenges.

The utilization of resources and assistance is essential for overcoming digital challenges, as they enable people to navigate complex technical environments with increased ease and effectiveness. According to a study by Barrot, Llenares, and Del Rosario (2021), in terms of strategies, students most utilized resource management and usage, help-seeking, improving their technical aptitude, time management, and control over their learning environment. These are the most common strategies that students use to cope with or overcome digital challenges. Additionally, in a study by Adum, Odogwu, Nwosu, and Duru (2015), it was found that most of the students adopt strategies to get over their challenges such as relying on internet-literate colleagues. This means that assistance through expert people is an effective way for students to cope with digital challenges.

This study revealed certain coping strategies that students used when dealing with digital challenges. Some challenges that they faced were internet connectivity and digital literacy.

Participant 1: "...pwede rin magpatulong at kung kaya naman po ay manood ng mga tutorials at tips sa iba't ibang tao." (I ask help from other people and I can also watch video tutorials and tips)

"Minsan po kasi ay… nakakapag tanong din po sa mga teachers kung pano gawin po 'yong mga nahihirapan po ako." *(Sometimes I ask my teachers on the things that I have difficulties with)*

P*articipant 2: "Pwede pong magtanong sa mga kamag-anak at manghingi po ng tulong kung kailangan po. Pwede rin pong magpaload ang humanap ng signal." (I ask my relatives and seek help if needed. I can also purchase internet packages and find a strong signal or internet connection)*

"Kung kailangang-kailangan po, nagpapa-load na lang po. Pwede pong magpatulong sa nakaka-alam." *(If needed, I will just purchase an internet package. It is also possible that I will seek help to those who are literate)*

Participant 3: "...paghahanap ng pwesto na may signal.... Ma'am ginagawan ko po siya ng paraan

para po maging okay po 'yong problem and manghihingi din po ako ng tulong kapag hindi ko na po kaya." (I just find a spot that has a strong internet connection. I make a way to fix the problem at ask for help if I cannot handle it anymore)

"...nagtatanong pa po ako sa ibang may kaalaman about po sa mga skills na kaya namin." *(I ask questions to the people who have knowledge about the digital skills)*

The participants' answers revealed certain coping strategies that they used, and their answers shared a similarity. All of them shared the coping strategy of asking for help and assistance from other people when faced with digital literacy challenges. Participants 2 and 3 had a similar coping strategy which was purchasing load or internet packages when faced with challenges involving internet access and connectivity.

The findings above contradicted the findings of Khan et al. (2021) which found that internet connectivity and accessibility were regarded as significant barriers and a challenge to online instruction in Bangladeshi private colleges. These barriers included gaining access to internet connectivity and the cost of purchasing data packages. The findings further demonstrated that students had challenges obtaining online courses, mostly because of unreliable internet availability and large data expenses. This means that purchasing data packages is a challenge and not a coping strategy. However, to combat this existing problem, the study suggested ensuring access to stable internet connectivity and providing financial support to students and teacher training on online pedagogy and assessment.

This implies that financial support and assistance are needed to cope with digital challenges. Providing students with financial support helps them overcome challenges in terms of internet accessibility and connectivity. Additionally, providing them with assistance helps them overcome challenges involving their digital skills and literacy. With these coping strategies, students will foster a more accessible and manageable digital environment and help them overcome digital challenges with ease whenever they encounter one.

Theme 2: The Internet helps students learn without any assistance.
Students can learn on their own with the aid of the internet. According to the responses of the participants, the internet helped them learn without any assistance.

Participant A: May mga lesson din po na nasa video. Mas napapadali 'yong pagkakaintindi po dun kasi po minsan po sa mga teacher na kahit sa personal na nagtuturo. (There are lessons that are on the videos. It became easier to understand because sometimes it is more understandable than teachers teaching it in person.)

Participant B: Nakaka-influence po kapag nakakapanood po ng mga video sa internet… (It is influencing if i see videos on the internet…)

The findings aligned with the study conducted by researchers at the Oxford Internet Institute, part of the University of Oxford in 2024. The study encompassed more than two million participants' psychological well-being from 2006-2021 across 168 countries. It was found that 84.9% of associations between internet connectivity and well-being were positive and statistically significant as the responses stated that they frequently learn on their own without guidance (Oxford, 2024).

According to a study by Papanis, Giavrimis, and Papani (2010), most students believe that the internet can significantly contribute to their learning process. Specifically, they claimed that using the internet can boost students' academic achievement, develop their capacity for independent and group learning, foster critical thinking and research abilities, increase motivation, and strengthen their self-confidence. It facilitates access to information that the educational system fails to provide.

Integration of social media in learning can also boost high school students' motivation in studying and learning outcomes (Almagro & Edig, 2023). This implies that the internet is a powerful tool for

enhancing well-being and educational outcomes, promoting self-directed and lifelong learning, and providing access to a wealth of information that can support personal and academic development. Both studies suggested that the internet provides access to information and educational content that may not be readily available through traditional educational systems. This means the internet can offer resources that enhance and improve traditional learning.

Theme 3: Social media can be helpful in acquiring academic information.
In the interviews conducted, it was shown that the students found social media not just entertaining, but also helpful in terms of acquiring information online. The students mentioned that they would often use social media applications to further improve their digital literacy.

Participant A: Minsan po ay nakakapanood din po ng mga tutorials… (Sometimes, I also watch tutorials…)

Participant B: Minsan po, kapag po nakakapanood po sa fb, natututo po doon kahit walang nagtuturo sa personal. (Sometimes, when I watch videos on Facebook, I learn from them even without personal instruction.)

These findings aligned with the construction component of Belshaw's Eight Components of Digital Literacy. In this component, students engage in reusing existing resources from the internet. It emphasizes their ability to build, modify, and contribute to their creativity, online or not. As said by the rural high school students, they used different social media applications in order for them to gain knowledge in improving their digital literacy. This would allow them to develop skills in terms of using different information online and applying it to their everyday lives.

In the Philippines, there are 65% of teenagers who have and use social media applications (Gregorio, 2013). Consequently, it is unsurprising that they are accustomed to utilizing various applications to aid them in daily tasks that may involve or require internet searches with the use of different applications. Despite the existence of the "Digital Gap" in rural areas, the students in this study seemed to be aware of the usage of social media in gathering information, academically or not.

This implies that rural high school students use social media more as this is what they are more inclined and knowledgeable about. In terms of their ways to improve their digital literacy, it appears that the students use social media more as their way on how to gain insights digitally. However, this may be the reason why some students struggle to look for reliable information online; although social media is accessible to wider people, not everything that is in there can be considered verified, making the students lack the critical component of digital literacy. Nonetheless, it was shown that social media plays a big role in shaping the students' digital literacy and can be a stepping-stone to enhancing their digital literacy.

4.4 Implication
The study's findings have significant implications for learning in general. It was shown that the students were capable of the basics of using technology, especially in terms of communication purposes. Given that the students were in a rural area, their capacity to adapt to the technology might be lesser than others in urban areas in the 21st century; thus, implementing a better curriculum that also focuses on ICT should also be considered by the education sector of the country.

Additionally, this study is beneficial in terms of the setting of the study since the results of the study could help the students be provided with learning materials to maximize their resources to further improve their digital skills despite their geographical locations and other factors such as poverty. This could reach at least the local government, which could also be the provider of more learning materials for rural high school students.

5. Conclusion

5.1 Conclusion

This study, which aimed to determine the digital literacy of the rural high school students, revealed the competencies and challenges in digital literacy faced by the rural school students. It was shown that they had different strengths and weaknesses in certain areas. The study also found out the students' challenges in terms of acquiring enough technological knowledge, as well as on how they cope and give solutions to their encountered problems involving the technology. This study also found out that the students were more inclined and better at using the internet in terms of communication and gathering and utilizing information. They were aware of the different software and its usage for the said competencies, contributing to their digital literacy in those aspects.

However, while the students were able to seek and use information from the internet, they encountered trouble whether the sites they found were trusted and credible or not. From what the students said, most of the time, they were not able to tell whether the information was factual or not. Additionally, their socio-economic status and their geographical location affected how often they could use the internet and their devices. The availability of internet in their areas may vary and appear to be inconsistent, making it difficult for rural high school students to have full access to the technology every day. The students also showed the effect of using technology on themselves, which they stated as something that affected their productivity, affecting their academic performance as a result. Their too much use of the internet affected them by making them unproductive with their school-related tasks, affecting their overall academic performance.

On the other hand, the students stated different coping strategies as solutions to their struggles in their digital literacy. The students mentioned that using different assistance and resources from the internet helped them in overcoming digital challenges. This included asking for help from different people including their teachers regarding a problem they have encountered digitally. Moreover, they also said that using different applications to gain more knowledge digitally contributed to their digital literacy overall, even without any assistance. Overall, the study emphasized the students' current competencies, struggles, and coping strategies in terms of their digital literacy. This study showed that the students still experience struggles in terms of the accessibility of the internet at their location. These results could help as a basis for what support must rural students get to further develop the necessary digital skills for their academic and future success.

5.2 Recommendations

1. Include a larger and more diverse group of participants to enhance the generalizability of the findings. This could involve multiple rural schools across different regions to capture a wider range of experiences and challenges.
2. Conduct comparative studies between rural and suburban or urban schools to highlight specific differences and similarities in digital literacy challenges, experiences, and coping strategies.
3. Examine how local cultural, economic, and infrastructural factors influence digital literacy.
4. Inclusion of participants from various socioeconomic backgrounds, grade levels, and genders to provide a comprehensive view of digital literacy issues.

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