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FOSTERING DIGITAL CITIZENSHIP IN THE UNIVERSITY OF BAGUIO BASIC EDUCATION

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ABSTRACT

Digital citizenship empowers people to participate actively and responsibly in society with access to and understanding of digital technologies. This study aimed to identify and analyze the strengths and limitations of learners' and teachers' digital citizenship practices at the University of Baguio Basic Education. A descriptive survey and a correlational study were applied. Given the pervasiveness of technology in every sector, respondents were already accustomed to modern digital technologies, and youngsters continue to accept new technologies as they mature into adults. This proved that their digital literacy was strong among female learners and male teachers but no significant difference among grade levels. Some competencies revealed a significant difference between all female and male teachers and learners across grade levels in the digital safety and resilience domain. Under participation and agency, only in the interacting, sharing, and collaborating where a significant difference was reported among teachers; netiquette for learners but grade levels showed no effect across all competencies. As to the digital emotional intelligence, a significant difference existed in the self-regulation, interpersonal skills, and empathy of learners from different grade levels, but only self-motivation varied between male and female learners, with no difference among teachers. Creative literacy varied among male and female teachers and learners but not their grade levels. The pandemic expedited the pace of digital transformation. Thus, approaches and strategies should continue to be developed and applied to foster the growth of digital citizenship in education.

Introduction

The shift to remote teaching and learning has brought digital citizenship to the forefront of education. As technology becomes increasingly prevalent, both teachers and students face new challenges related to digital ethics, such as cyberbullying, managing digital footprints, and preventing plagiarism. Educators have a responsibility to ensure that students are equipped with the necessary skills to navigate technology safely and responsibly. The use of technology in education expands the boundaries of traditional classrooms, allowing for learning to take place anytime and anywhere. This opens up a world of possibilities, enabling students to engage in lifelong learning and share knowledge beyond the confines of the physical classroom. Becton (2021) emphasizes the importance of leveraging technology tools to extend learning experiences and foster a culture of continuous learning and knowledge sharing.

Digitalization reshapes the way people work, and the type of work they do. Highly-skilled workers carry out technology-driven completion tasks. Over time, the impact of technology will vary across occupations. This is where retooling education for the digital era requires two essential facets - the curriculum and the quality of teachers, particularly at pre-tertiary levels (OECD, 2019). In order to align education with the demands of the digital era, it is necessary to enhance teaching practices across all educational

levels. This includes ensuring that schools have adequate information and communication technology (ICT) infrastructure, enhancing the ICT skills of teachers, and incorporating ICT into the curriculum. These priority areas were identified in the 2020 edition of the Economic Outlook for Southeast Asia, China, and India: Rethinking Education for the Digital Era.

The Digital Kids Asia-Pacific (DKAP, 2019) Framework guides children's digital citizenship interventions by providing a holistic, rights-based, and child-centered approach structured across five domains and 16 competencies. The domains include literacy, safety and resilience, participation and agency, emotional intelligence, creativity, and innovation. This encompasses the cognitive, behavioral, and socio-emotional dimensions of the children's holistic development. One of the five domains that must be developed for children to become holistic digital citizens is digital literacy. As a result, introducing Digital Literacy into school must be one of the most important steps toward equipping children to fully utilize the technological learning resources (Shin, 2019).

The Department of Education's Digital Rise Program allowed digital literacy to resurface. DepEd Commons was created to support the continuous delivery of basic education, facilitating enabling environments for using ICT for Filipino learners guided by teachers all over the country (DepEd, 2020). In addition, Hernando-Malipot (2021) recently reported that a new Educ Futures unit of DepEd has been created and aims to seek answers to numerous challenges facing education and craft policies based on research, and global trends, and best practices.

Given the situations mentioned above, it is clear that the education system is a pivotal element in ensuring that the future workforce has the required digitally-skilled professionals. The better students are trained today in digital skills, the easier it will be to find a good job in the future. Sheykjan (2017) emphasized that the true purpose of education in the digital age is to empower researchers, educators, students, and families to be empathetic, responsible consumers and creators in the digital space and maintain a community that values and practices positive digital citizenship. The researcher selected UNESCO'S DKAP project, backed by Korean Funds-in-Trust, and aims to help the Member States establish evidence-based policies that cultivate digital citizenship and promote children's safe, effective, and responsible use of technology.

Digital Citizenship Framework

Fostering digital citizenship in education entails searching for logical answers and practical solutions during the current online education practices. The time might not be enough to focus on investigating what educators and learners have experienced in online learning when the pandemic ends. Finding answers will help better learning experiences for clients. The United Nations Educational, Scientific, and Cultural (UNESC0) Digital Kids Asia-Pacific (DKAP) Framework for Education was applied using UNESCO's digital citizenship as a reference.

These five categories of digital citizenship form a comprehensive framework for a young digital citizen's holistic development. What it means to be a digital citizen must be understood and applied by learners. They cannot, however, accomplish it alone. Parents, schools, businesses, and the government all have a part in ensuring children's online safety and responsibility.

DKAP (2019) emphasized that keeping children away from digital devices, contrary to popular belief, is not a practical approach to teaching them about safety. Instead, parents must recognize that, rather than restriction, education and critical contact play a significant part in developing their children's online conduct. In addition to what parents educate their children at home, teachers and educators play an important role in helping youngsters become digital citizens. Therefore, media literacy instruction should be integrated into the educational system, according to the Education 2030 agenda.

To prevent cyberbullying, schools must teach youngsters online empathy and digital safety. Educators must also teach youngsters to think critically, conduct adequate research, comprehend the tools they encounter, and distinguish authentic from false news.

Digital citizenship, as defined by the DKAP Framework, entails more than just security and protection; children must also learn self-expression and introspection, and constructive social interaction. Adults must assist this by incorporating a holistic approach to digital citizenship into policies, education programs, and even children's digital competence involves the confidence, critical and responsible use of, and engagement with digital technologies for learning, participation in society, and work. It includes information and data literacy, communication and collaboration, media literacy, digital content creation (including programming), safety (including digital wellbeing and competencies related to cybersecurity), intellectual property-related questions, problem-solving and critical thinking (European Commission, 2019). Ribble (2020) categorized the previous 2007 book about Digital Citizenship in Schools from 9 key elements of digital citizenship to REP – Respect (etiquette, access, & law); Educate (literacy, communication, & commerce); and Protect (rights and responsibilities, security, health, & wellness). He recommends that everyone who uses and educates others about technology keeps these in mind.

Learning Theories to Foster Digital Citizenship

To further understand how to foster digital citizenship in schools, connectivism as the learning theory applies to learning and knowledge that must be considered. It allows learners to encourage each other to be involved in internet use, networks, making patterns, metacognition, and realizing emergent knowledge (Heick, 2020). However, research and practice have determined teachers' lack of digital competence and educational organizations' lack of digital readiness as crucial issues. As a result, the capacity of education, particularly schools and teachers, to exploit new technologies and develop their roles with these opportunities seem to be the main challenges facing modern education systems. The pandemic, in a way, catapulted schools into delivering their services, ready or not. Schools made modifications to better equip their employees to operate in whatever uncharted circumstances schools face now and in the future. The internet is a place where they may have their voices heard and stand up for others who are unable to speak for themselves. If educators emphasize the internet as a place where students must focus on building and sustaining a personal brand, learners may be more likely to use it. Students would stay focused on selecting how they want to be seen and heard online, allowing them to build valuable skills that may help them learn and grow in an ever-changing online environment.

With the expansion of technology-based educational tools in the classroom, digital citizenship has become a hot issue among teachers. Students moved away from using computers for word processing and information collecting and toward a paradigm that involves networking, social media participation, sharing their lives online, and content creation. As a result, the idea that children should be taught how to be digital citizens and comprehend the potential ramifications and implications of their online actions arose. They needed to learn how to think critically and be cautious about how much and with whom their information was shared (Dotterer et al., 2016).

Another theory that may be adapted to cater to the needs of the learners when teaching digital citizenship is the multimodal learning theory. It is also known as the cognitive theory of multimedia learning (CTML), which focuses on how learning happens in screen-based technologies, much like most of the world's learners are experiencing recently. The auditory and visual inputs must be in sync but not overwhelming to help the learners (Drew, 2021). Applying this concept, schools scheduled classes so that teaching-learning applied many methods to increase knowledge understanding, underscoring the need for a multimodal learning technique in the synchronous classes conducted via its subscription to the Google Workspace. Multimodal learning provides learners with a more engaging and all-encompassing learning environment. As a result, they are not compelled to learn in a method that does not fit their learning style, which boosts their interest in the material. In addition, multimodal learning allows teachers to incorporate various exciting materials into the LMS classroom. Finally, multimodal learning strategies can take advantage of the technology and digital learning resources students enjoy.

John Sweller's cognitive load theory should also be considered when a teacher prioritizes imparting information in small, manageable bits of knowledge to build up learning. Thus, fundamental is the evolutionary shift of education that forms from cognition (the "knowledge" paradigm of education) to constructive creation (the "cognitive" paradigm of education). Under the new conditions, students' competencies are seen as readiness and ability to take specific actions, and they are the result of each period of "building up" their knowledge (Frolova et al., 2020). In addition, the growth in the scale and importance of intellectual and creative activities (Lapteva & Efimov, 2016) set a new vector for the modernization of the educational sphere. Applying this concept is seen when lessons and assessments are uploaded weekly in the LMS of each subject with a combination of synchronous and asynchronous teaching-learning modalities.

The self-efficacy theory, first coined by psychologist Albert Bandura, is essential when fostering digital skills. He defined self-efficacy as people's beliefs in their capabilities to exercise control over their own functioning and events that affect their lives (Lopez-Garrido, 2020). When someone is highly motivated to succeed, they are more likely to fulfill whatever goals they set for themselves, which correlates to higher levels of self-efficacy. The Self-efficacy Theory of motivation is a means to explain why people do what they do. Self-efficacy has been a substantial predictor of success in studies' high performance. By increasing self-efficacy or that of the students, one can raise confidence and performance. The application of self-efficacy is also expected from the UB learners where self-regulated learning is elicited. The limits set by the online learning modality made this even more possible. Reaching out to their teachers during this pandemic is not as easy as the in-person classes before, forcing them to find ways to help themselves and seek help within their homes. The internet is just a click away if no one is available to help.

Similarly, Constructivist Learning Theory believes that meaning is generated in the mind and that prior knowledge is utilized in the learning process. Over time, as more and more additional knowledge increases through experience, a more complex understanding develops. This is what is hoped for to happen as the UB self-regulated learners apply what they have learned when they submit their written works and performance tasks and express themselves during their weekly online meetings.

In support, Drew (2021) explains the connection of Pragmatic Education Theory that lessons must have practical outcomes that can be applied in students' lives outside of school. The use of technology allows this to happen. The learners create outcomes for a school requirement using technological tools available for them and develop the digital skills in the process, hopefully relearning new skills dedicated to the unique demands of the labor market, emerging positions, and adapting to societal changes. The teacher and student interaction in the digitalization conditions might look somewhat different - connecting people to discuss, learn, and tackle shared problems.

As to the readiness of the educational space to introduce digital technologies, learning resources are abundant. Digital education platforms are increasingly acquired and implemented due to their affordances for surveillance and educational management and keeping educational institutions running even in a crisis. Technologies indeed appear as the solution (Teras et al., 2020).

Teacher's Role in Digital Education

Constructivism sees the teacher step aside to a new role as a facilitator while the students create their own knowledge and their learning pathways (Heick, 2020). Much of the experiences in the recent two academic years applying online learning modality showed the facilitator role of teachers considering the limited synchronous classes thru Google meet and asynchronous classes thru Google Classroom. In contrast, due to little teacher supervision, learners are forced to find ways to learn and accomplish tasks by themselves. Some might have their parents and siblings to help them, but others might not. Online collaboration between and among learners poses a challenge, especially if they do not engage with their peers, which is often a reason why assigned or selected groupings are a challenge to some.

For digital education to become inclusive, the approach should be learner-centered and must answer students' needs, assisting people lacking digital skills. The mindset is about continuous learning. Technology should be a tool for making learning more adaptive and flexible to improve understanding and outcomes for individuals. The challenge is identifying the skills needed today and predicting where skill gaps and shortages may develop. In addition, learners expect more options for personalization, collaboration, and improved connection between what they learn in school, on the internet, and at work in their lifelong learning journey (Brolpito, 2018).

Statement of the Problem

This study aimed to discover and analyze the strengths and limitations of UB Basic Education digital citizenship practice. The relationship between variables and the level of agreement of digital citizenship among learners and teachers was investigated. It sought to address, in particular, the following issues:

1. What is the different access to digital devices by learners in terms of gender and grade level?

2. What is the different usage of digital devices by learners in terms of time, internet usage, influencers, and purpose along gender and grade level?

3. What is the learners' level of agreement of digital citizenship along the five domains: digital literacy, digital safety and resilience, digital participation and agency, digital emotional intelligence, and digital creativity and innovation?

    3.1 Is there a significant difference in the learners' level of agreement of their digital citizenship in the five domains according to gender and grade level?

4. What is the teachers' level of agreement of digital citizenship along the five domains: digital literacy, digital safety and resilience, digital participation and agency, digital emotional intelligence, and digital creativity and innovation?

    4.1 Is there a significant difference in the teachers' level of agreement of their digital citizenship in the five domains according to their gender?

5. What are the initiatives of the University of Baguio in fostering digital citizenship?

Design and Methodology

Research Design

A descriptive survey was applied to quantitatively identify the level of agreement on the digital citizenship of learners and teachers. It was also a correlational study to reflect the strength of the relationship between gender and among grade levels as variables. The self-reporting survey provided the digital citizenship level of agreement of University of Baguio Basic Education learners and teachers.

Population and Locale of the Study

All interested learners and teachers from the University of Baguio Basic Education (UB-BE) were invited to participate in the study to achieve a convenience sampling size. Using Cochran's formula, the learners' and teachers' total answered and submitted survey forms showed a confidence level of 93.5% and 90%, respectively. Respondents in the study were online learners who enrolled in the first semester of the school year 2021-2022. Specifically, Laboratory Elementary School (UBLES), High School (UBHS), and Science High School (UBSHS) online learners. The teachers currently teaching in the same school year who gave their permission and approval to be part of this research were included. Gender as a moderator variable referred to being a boy and a girl, the same term used in the DKAP survey. Comparisons were also made among grade levels. Because the survey was given online via google forms due to ongoing online classes during the study's conduct, responses were generated from grades 5-12, totaling 199 in all.

Data Gathering Tool/s

The researcher adopted the Digital Kids Online Survey (Shin et al., 2019), which looked at learner attitudes, behaviors, competency levels, and ICT use when using the internet or digital technologies in their daily lives. It was created in collaboration with UNESCO Bangkok by the Institute of School Violence Prevention at Ewha Womans University in South Korea. In all, 98 items were included in the final set of questions asked from the learners. The extent of the slight modifications to the original survey was about access to and usage of digital devices where the words "before and during the pandemic" were added.

Treatment of Data

To answer problem 1 on access to digital devices and problem 2 on learners' usage of digital devices in terms of time, internet usage, influencers, and purpose, the researcher utilized frequency and percentage. For problem 3, the learners' digital citizenship level of agreement in the different domains per competency were identified initially using the mean and standard deviation. The computed mean was interpreted using the 4-point Likert Scale. For subproblem no. 3.1 that tested if there was a significant difference between the digital citizenship of learners of different gender (male and female), the p-value was identified after a t-test for independent populations assuming equal variances was applied. A Mann-Whitney test determined the significant difference between genders along the five digital citizenship domains. For learners' digital citizenship level of agreement from different grade levels, analysis of variance was utilized. The Kruskal-Wallis test was used to see if a significant difference exists in the level of agreement on digital citizenship of learners from different grade levels. For problem 4, the teachers' digital citizenship level of agreement in the different competencies under each domain was identified using the mean and standard deviation. The computed mean was interpreted using the 4-point Likert Scale specified in table 3. For subproblem no. 4.1 that tested if there was a significant difference between the digital citizenship of teachers of different gender (male and female), a t-test for independent populations assuming equal variances was implemented where the p-value was indicated in the table. A Mann-Whitney Test determined its significance. The researcher utilized multiple correlation analyses to see the correlation between the different domains. The Pairwise Mann-Whitney test was employed to test the significance of the computed correlation coefficient. In all the statistical tests, a 0.05 level of significance was used. Finally, to answer problem 5, open and accessible online documentation was utilized, aside from the publicly available information from the UB website, UB-BE schools' Facebook page, and UB employee email announcements. The UBSHS Principal shared other pertinent documents related to the study. Empirical observations as a basic education teacher and assistant principal were added to address the qualitative problem about UB's efforts and initiatives to promote digital citizenship among teachers and learners

Ethical Considerations

Respondents and their parents who agreed to participate in the study completed a Google Forms survey posted in their advisory classes or research subjects' Google Classroom and Facebook messenger (if available). The link remained accessible from October to December 2021. It is possible that the total time, including preliminaries, took them as much as 30 minutes to complete. On the other hand, respondents had the option to withdraw at any time, which meant not finishing the survey or choosing not to click the submit button.

Presentation, Analysis, and Interpretation of Data

Place of Internet Access by the Learners Before and During the Pandemic

The majority of the learners spent 7 hours a day or more accessing the internet in their homes, pandemic or not. This went up dramatically during the pandemic since the learners were learning from home and going out were limited. In school, before the pandemic, most male learners accessed the internet for less than an hour a day (20.48%), while hardly ever for most female learners (29.31%). Reasons for their responses may be influenced by the class schedules and the nature of the subject. There could be Wi-Fi in school, but it was not strong enough to allow fast access to all users, and the use of gadgets may also be limited if not forbidden during class hours. Grades 11 and 12 may have some vacant time during the day considering their class schedule compared to more rigid and continuous classes by the grades 5 to 10 learners who were not allowed to leave the premises except during recess and lunchtime. But then again, it depended on the guidelines set by the school. Also, some of them had mobile data, which allowed them to access the internet anytime and anywhere, given a chance to use their internet-ready gadgets brought to school.

Due to the self-reporting nature of the survey, there are differing trends across grade levels. It could also differ depending on the quality of their internet connection in their specific locales. Internet speeds can also fluctuate daily. Some internet providers offered promotional additional internet speeds, such as double the subscription. Differences in answers may also be caused by the number of devices connected and the activity performed on those devices when browsing the internet. Academic digital activities differ by grade level and from school to school. Because the participants were from UBLES, UBHS, and UBSHS, reasons were not asked or mentioned in the survey, including their topic requirements, which may differ. They were just asked how much time they spend on the internet in pre-determined locations daily.

Access to Digital Devices and Internet Access of Learners at Home and Local Community

The primary learning devices (desktop, laptop, smartphone, tablet, and printer) were available in 16 percent of female and male participants' homes, whereas 14 percent had laptops, smartphones, and printers. Essentially, it can be observed that almost all learners had smartphones. The selections made by the females are almost similar to the males, except those males have slightly more desktop computers than females. Due to the gaming capability offered by desktop processors, males may prefer a desktop computer for gaming purposes. Users can even assemble their gaming PC from components of their choosing. When comparing equivalent specifications, desktops may cost less than laptops. Desktops also provide easy upgrades and a broader range of compatibility. As for their internet connection at home, most learners only had wireless internet connections, followed by those with wired connections only. There were still less than 2% with no internet connection at home. Nonetheless, the majority of the respondents had internet connections at home. As technology is further introduced into the homes and local communities, learning engagement everywhere may enhance the learners' 21st-century skills. Learners across grade levels have various combinations of digital devices depending on what their parents bought or gifted to their learners.

Usage of Digital Devices by Learners

More males (80%) than females (65%) used digital devices for more than 5 years. However, it can be seen that the majority of the learners had used digital devices for more than five years. In the case of grade 5 learners, it can be observed that the remaining percentage was scattered at different times. This was not surprising since ownership of digital devices may be introduced gradually to them by their parents because of their age. The general trend of increasing percentage of learners' digital devices used at different times as the grade level goes up can be seen. This was because their age was a factor when parents limit the amount of time their learners may spend exploring and using digital devices. Their subject requirements may also be another factor to consider when and how long digital devices are used, not to forget the rules and regulations in the student handbook that may limit the use of devices during school hours. Although, this may change eventually due to the different modalities that schools offer.

For the duration of the pandemic, most learners from grades 7 to 12 spent 7 hours or more in school study using the internet and devices, while 3 to 4 hours for the majority of grade 5 and 6 learners. The limited screen time for the latter depended on the synchronous class hours allotted by the school, and learners must adhere to parental considerations. The 71.43% from Grade 9 was because they had the least turnout in submitting the survey despite the three months of posting and help from the school heads to disseminate. The same percentage of grade 9 students chose 7 hours or more, which could be attributable to the nature of synchronous class scheduling, the usage of technology in producing school obligations, and activities at UB-BE.

Influencers in the Use of Computers and the internet

The majority of the learners were self-taught in using the computer, followed by learners taught by their family members. As for internet usage, most of the learners were taught by their family members and followed by self-taught learners. It was quite

evident that their teachers influenced a few or less than 15% of the learners in the use of the computer and internet. An exception is apparent for grades 5 (15.38%), 6 (34.62%), and 10 (21.43%), where their teachers influence a considerable percentage of learners.

Usage of Digital Devices and the Internet for Different Purposes

Comparing the three purposes asked of the learners, they use the computers and the internet daily for 1 to 2 hours mostly for learning ideas not related to their subjects in school and socializing with friends. In comparison, 3 to 4 hours daily were spent for leisure. Apart from asking the learners about the three purposes for using digital devices and the internet, they were also asked whether they learned coding skills at school and developed websites or applications. It turned out that 67% said yes to learning coding skills, and 58% said no to developing websites or applications. Identifying further which grade level responded most, grades 7 (86%) and 8 (80%) mostly said they learned basic coding skills at school. While it was mostly from grade 12 (60%) who developed websites or applications, many grade 11 learners said no (94%). The question was asked because this is one way to express themselves creatively and explore innovation by creating content using ICT tools.

Specifically, the table revealed that most female and male learners spent 1 to 2 hours learning ideas unrelated to their subject daily. All grade levels consume 1 to 2 hours except for most grades 7, 8, and 10 learners who spend 3 to 4 hours daily. On the other hand, the time spent daily by most male and female learners is devoted to using digital devices and the internet for leisure like playing games, watching videos, listening to music, and reading manga was 3 to 4 hours. All the grade levels spent mostly 3 to 4 hours daily except for grades 9 and 11, who spent 7 hours or more.

In the case of daily socializing with friends, more than 50% of the learners spent 1 to 2 hours (27.64%) and 3 to 4 hours (25.63%). Meanwhile, the differences in grade levels vary. Most learners from grades 5, 8, and 9 spend 1 to 2 hours; grades 7, 10, and 12 mostly spend 3 to 4 hours; while an equal number of grades 6 learners were split between 1 to 2 and 3 to 4 hours. A similar observation was seen in grade 11, where an equal number were divided between spending 1 to 2 hours and 7 hours or more socializing with friends.

Learners' Level of Agreement of Digital Citizenship along the Five Domains

The computed mean of the competencies under digital literacy was said to be strongly agreed upon. This implied that under ICT literacy, learners usually managed to operate ICT hardware and software responsibly in digital environments to access and search for data, information, and content and utilize them. As for their information literacy, they also usually can seek, critically evaluate and use digital information effectively to make informed decisions with a mean of 3.30. In relation to the strongest predictors of high competencies in the five areas of digital citizenship, the data indicated that respondents had a high level of digital literacy as a result of their prior encounters with devices in terms of duration.

Under the digital safety and resilience domain, the computed value for the competencies: understanding the child's rights, personal data, privacy and reputation, and digital resilience were interpreted to be strongly agree. This implied that learners usually understand legal rights and obligations within the global and local contexts and how to use and share personally identifiable information while being able to protect oneself and others from harm. The learners also were clearly able to implement strategies for information and device security and personal security protocols and be preventive, reactive, and transformative, allowing them to avoid or cope with the risky situations they face and improve themselves. As for the promotion and protection of health and wellbeing, learners were able to recognize how to identify and manage health risks and use digital technology in order to protect and improve the physical and psychological well-being of oneself and others. The Digital Resilience competency assessed learners' ability to use preventative, reactive, and transformative abilities to avoid or cope with risky situations encountered online.

It was quite interesting to note that the learners had different responses on the competencies under this domain for digital participation and agency. The learners agreed on interacting, sharing, and collaborating and strongly agreed on the netiquette while disagreeing on the civic engagement. This implied that the learners usually demonstrate ethical and courteous behavior to inform choices in interacting and engaging with other people in different digital environments and with diverse audiences. The learners can be seen and recognized to interact, share data and information, and collaborate with others using suitable digital technologies to achieve shared goals. While the ability and willingness to recognize, seek out, and act on opportunities to positively influence local and global communities online and/or offline through appropriate digital technology use can be observed to some extent only. This demonstrated that learners' lack of prior experience developing a web or mobile application, which was the strongest predictor of high competencies in this domain, substantially influenced the various levels of agreement. During the early stages of DKAP's development, this domain had the most homogenous low-performance level among all learners (UNESCO, 2019).

Under the domain of digital emotional intelligence, learners strongly agreed on self-awareness and self-motivation and agreed with the other competencies. With this, learners can usually use introspection to explain their moods, emotions, drives, and

how these affect themselves and others in the digital context. The learners can also be clearly seen to demonstrate initiative and a commitment to attain internal of external goals despite setbacks. As for the other competencies, learners can be seen to manage emotions, moods, and impulses during online engagements, build positive online relationships to communicate, build rapport and trust, embrace diversity, manage conflicts, and make sound decisions. Lastly, the learners can be recognized for demonstrating awareness and compassion for the feelings, needs, and concerns of others during digital interactions. UNESCO 2019 study, on the other hand, stated that due to the fact that they were able to practice this domain using gadgets available at home, they were able to strongly agree on two points and agree on three others. Among DKAP-studied countries, this was the second most disparate domain.

For digital creativity and innovation, it can be seen that the computed mean for its competencies was interpreted as agree. This suggested that the learners can be seen and recognized to apply skills and use tools to create, adapt, and curate digital content. The ability of the learners to use technology to represent or creatively express their identity can also be seen. Even if learners spend more time each day on digital devices, this does not imply an improvement in their creativity and originality. Other predictors of high competence in this domain become relevant. To respond to a greater level of agreement, they would need prior learning experiences with coding and constructing a website or app. As a result, this domain needs improvement. Likewise, domain performance is notably poor across countries and had the highest standard variations within the countries studied (UNESCO, 2019).

Table 1 Learners' Level of Agreement on Digital Citizenship along the 5 Domains

Domain	Competencies	Mean	SD	Descriptive Equivalent
Digital Literacy	ICT Literacy	3.40	0.4763	Strongly Agree
	Information Literacy	3.30	0.5329	Strongly Agree
Digital Safety and Resilience	Understanding Child's Rights	3.78	0.5285	Strongly Agree
	Personal Data, Privacy, and Reputation	3.68	0.5022	Strongly Agree
	Promoting and Protecting Health and Well-Being	3.12	0.5231	Agree
	Digital Resilience	3.50	0.5664	Strongly Agree
Digital Participation & Agency	Interacting, Sharing, and Collaborating	3.14	0.6428	Agree
	Civic Engagement	2.45	0.6179	Disagree
	Netiquette	3.55	0.5221	Strongly Agree
Digital Emotional Intelligence	Self-awareness	3.33	0.5464	Strongly Agree
	Self-regulation	3.23	0.5410	Agree
	Self-motivation	3.26	0.5418	Strongly Agree
	Interpersonal Skills	3.11	0.6173	Agree
	Empathy	3.12	0.6221	Agree
Digital Creativity and Innovation	Creative Literacy	2.91	0.7164	Agree
	Expression	2.90	0.7107	Agree

Level of Agreement of the Learners' Digital Citizenship in the 5 Domains According to Gender

It was observed that the computed mean of female learners (3.44) for digital literacy exceeded that of male learners (3.33). This difference was supported by accepting the hypothesis that the level of agreement of female learners was greater than that of male learners. Thus, the learners' digital literacy was affected by their gender, and the gap needs to be closed.

In the digital safety and resilience domain, it was observed that in some of the competencies, there was said to be a significant difference between the level of agreement of male and female learners. Under these competencies: understanding child's rights, personal data, privacy and reputation, and digital resilience, it can be said that the females' level of agreement was greater than that of the male learners, while no significant difference exists in promoting and protecting health and wellbeing.

In contrast with the other domains, digital participation and agency had more competencies, with males and females having no significant difference in their level of agreement. Though the interpretation for the male agreement under the civic engagement was agree while for the female was disagree, this difference was said to be not significant. In the netiquette aspect, though the mean for the males and females were interpreted as both strongly agree, a significant difference existed between them. Thus, the female learners had a higher level of agreement under netiquette.

Under digital emotional intelligence, it was quite interesting to see that only in self-motivation that a significant difference exists between the level of agreement of male and female learners. With this, the self-motivation of female learners can be seen to be higher than that of male learners. In contrast, the male and female learners had the same digital emotional intelligence as the other competencies.

For the last domain, digital creativity and innovation, it can be seen that a significant difference exists between the level of agreement of male and female learners for creative literacy. Since the computed mean of female learners was greater than that of

the male learners, the creative literacy of females was greater than that of male learners. As for the expression, this was not affected by the learner's gender.

In summary, females had higher mean than males in terms of their level of agreement across all digital citizenship domains and competencies except for civic engagement. While across all competencies in the five domains, equal number of competencies had significant and not significant differences between the female and male learners (8 each). Of all eight competencies with significant differences, five were significant using two-tailed tests accounting for three scenarios. At the same time, three were significant in a one-tailed test which accounts for just one scenario. Thus, the hypothesis was negated, instead there were significant differences between the male and female learners' level of digital citizenship agreement.

Table 2 Mann-Whitney Test on the Level of Agreement of Male and Female Learners on Digital Citizenship

Domain	Competencies	Gender	Mean	Descriptive Equivalent	p-value	Interpretation
Digital Literacy	ICT Literacy	Male	3.33	Strongly Agree	0.027	Significant
		Female	3.44	Strongly Agree		
	Information Literacy	Male	3.23	Agree	0.043	Significant
		Female	3.34	Strongly Agree		(One-tail)
Digital Safety and Resilience	Understanding Child's Rights	Male	3.70	Strongly Agree	0.024	Significant
		Female	3.83	Strongly Agree		
	Personal Data, Privacy, and Reputation	Male	3.59	Strongly Agree	0.003	Significant
		Female	3.74	Strongly Agree		
	Promoting and Protecting Health and Well-being	Male	3.09	Agree	0.495	Not Significant
		Female	3.14	Agree		
	Digital Resilience	Male	3.41	Strongly Agree	0.028	Significant (One-tail)
		Female	3.57	Strongly Agree		
Digital Participation & Agency	Interacting, Sharing, and Collaborating	Male	3.08	Agree	0.319	Not Significant
		Female	3.19	Agree		
	Civic Engagement	Male	2.52	Agree	0.293	Not Significant
		Female	2.39	Disagree		
	Netiquette	Male	3.41	Strongly Agree	0.005	Significant
		Female	3.64	Strongly Agree		
Digital Emotional Intelligence	Self-awareness	Male	3.25	Strongly Agree	0.127	Not Significant
		Female	3.38	Strongly Agree		
	Self-regulation	Male	3.17	Agree	0.213	Not Significant
		Female	3.27	Strongly Agree		
	Self-motivation	Male	3.17	Agree	0.031	Significant (One-tail)
		Female	3.33	Strongly Agree		
	Interpersonal Skills	Male	3.09	Agree	0.858	Not Significant
		Female	3.11	Agree		
	Empathy	Male	3.11	Agree	0.913	Not Significant
		Female	3.12	Agree		
Digital Creativity and Innovation	Creative Literacy	Male	2.78	Agree	0.016	Significant
		Female	3.01	Agree		
	Expression	Male	2.89	Agree	0.571	Not Significant
		Female	2.92	Agree		

Level of Agreement of Learners from Different Grade Levels on Digital Citizenship

It was observed that under the digital literacy domain, the computed mean for the level of agreement of learners from the different grade levels had different descriptive equivalents ranging from agree to strongly disagree. This difference was supported by negating the null hypothesis that no significant difference exists in the level of agreement of learners with different grade levels. Thus, their grade level affected digital literacy, which included the learners' ICT literacy and information literacy. Another interesting point was that grades 5, 6, and 9 agreed on both the ICT and information literacy, while grades 7, 10, and 12 strongly agree.

As for digital safety and resilience, the computed means for understanding child's rights and personal data, privacy, and reputation for all the grade levels were interpreted to be strongly agree. Still, a significant difference existed in the mean level of agreement of the learners from different grade levels. With this, the grade level of the learners had an effect on the 2 competencies. As for the promotion and protection of health and wellbeing, there was not enough evidence to prove a significant difference existed among the learners. However, the level of agreement of grade 5 was strongly agreed, and the other grade levels agreed. In digital resilience, a significant difference existed in the level of agreement of the different grade levels.

Under the digital participation and agency domain, it was quite interesting that for its 3 competencies, no significant difference existed in the level of agreement of learners from the different grade levels. Although the descriptive equivalent of the levels of agreement under interacting, sharing, collaborating, and civic engagement were different, these differences were not significant. As

for netiquette, the similarities in the interpretation of the computed means were supported by having no significant difference. With this, the domain of digital participation and agency can be said to be not affected by the learner's grade level. Considering the age of grades 5 and 6, they may, in their own way, practice civic engagement and positively influence global and local communities online and offline through appropriate technology use whenever they can. Digital technologies offer much potential for learners to realize their social responsibility. In the upper grades, the youth may display civic involvement by acting on concerns and participating in community activities, expanding their online contacts.

In the digital emotional intelligence, it was observed that the level of agreement of learners in their self-awareness and self-motivation had no significant difference from the other grade levels. In contrast, a significant difference existed in learners' self-regulation, interpersonal skills, and empathy from different grade levels. Thus, the grade level of the learners contributed something to their level of agreement on self-regulation, interpersonal skills, and empathy. At the same time, it did not affect their self-motivation and self-awareness.

For the last domain, same with the digital emotional intelligence, no significant difference was observed in the level of agreement of learners from different grade levels. With this, learners' creative literacy and expression were not affected by the difference in their grade levels. Learners must develop the abilities to recognize and express their emotions in the digital environment as they spend more and more time online chatting, participating, and forming relationships.

Teachers' Level of Agreement of Digital Citizenship along the 5 Domains

Similar to the learners, it can be observed that the computed mean of the competencies under digital literacy was said to be strongly agree. This also implied that under ICT literacy, teachers usually manage to operate ICT hardware and software responsibly in digital environments to access and search for data, information, and content and to utilize them. They had the opportunity to practice ICT and information literacy as teachers over the years of teaching. It would be challenging for them to keep up with the changes in technology use in school if they could not do so. In addition, the teachers can usually seek, critically evaluate and use digital information effectively to make informed decisions.

It was also observed in digital safety and resilience, the computed for all the competencies were interpreted to be strongly agree. This implied that teachers usually understood legal rights and obligations within the global and local context, how to use and share personally identifiable information while being able to protect oneself and others from harm, and implement strategies for communication and device security and personal security protocols. Their assertion was based on their attendance at data privacy webinars. The UB Human Resource Management Center (HRMC) gave in-service training, particularly in the early days of the pandemic, when schools switched to virtual classes. The teachers were also clearly able to identify and manage health risks and use digital technology to protect and improve physical and psychological well-being. Lastly, they clearly had the ability to be preventive, reactive, and transformative, allowing them to avoid or cope with the risky situations they faced and improve themselves.

Under digital participation and agency, the teachers had different responses to the competencies under this domain. The teachers agreed on interacting, sharing, collaborating, and civic engagement while strongly agreeing on netiquette. This shows that the teachers usually had the ability to demonstrate ethical and courteous behavior to inform choices in interacting and engaging with other people in different digital environments and with diverse audiences. The teachers can be seen and recognized to interact, share data and information, and collaborate with others using suitable digital technologies to achieve shared goals. For their civic engagement, it implied that the teachers could be seen to have the ability and willingness to recognize, seek out, and act on opportunities to positively influence local and global communities online and/or offline through appropriate digital technology use.

As for the domain of digital emotional intelligence, the teachers strongly agree on self-awareness, self-regulation, and self-motivation while agreeing on interpersonal skills and empathy. This implies that teachers can be said to usually use introspection to explain one's moods, emotions, drives, and how these affect oneself and others in the digital context. The teachers can also be clearly seen to have the ability to manage emotions, moods, and impulses during online engagements and demonstrate initiative and a commitment to attain internal of external goals despite setbacks. As for interpersonal skills and empathy, teachers can be seen to have the ability to build a positive online relationship to communicate, build rapport and trust, embrace diversity, manage conflicts, and make sound decisions. The teachers can also be recognized for demonstrating awareness and compassion for the feelings, needs, and concerns during digital interactions.

For the creativity and innovation, same with the learners, it can be seen that all its competencies were interpreted to be agree. This also suggested that the teachers can be seen and recognized to apply skills and use tools to create, adapt, and curate digital content and use technology to represent or creatively express their identity.

Table 3 Level of Agreement of the Teachers on Digital Citizenship along the 5 Domains

Domain	Competencies	Mean	SD	Descriptive Equivalent
Digital Literacy	ICT Literacy	3.54	0.4827	Strongly Agree
	Information Literacy	3.45	0.4391	Strongly Agree
Digital Safety and Resilience	Understanding Child's Rights	3.93	0.2263	Strongly Agree
	Personal Data, Privacy, and Reputation	3.85	0.2763	Strongly Agree
	Promoting and Protecting Health and Well-Being	3.34	0.5868	Strongly Agree
	Digital Resilience	3.50	0.4431	Strongly Agree
Digital Participation & Agency	Interacting, Sharing, and Collaborating	3.12	0.7144	Agree
	Civic Engagement	2.63	0.8279	Agree
	Netiquette	3.72	0.4000	Strongly Agree
Digital Emotional Intelligence	Self-awareness	3.43	0.4756	Strongly Agree
	Self-regulation	3.52	0.4643	Strongly Agree
	Self-motivation	3.40	0.4588	Strongly Agree
	Interpersonal Skills	3.02	0.7450	Agree
	Empathy	3.02	0.7384	Agree
Creativity and Innovation	Creative Literacy	3.01	0.7017	Agree
	Expression	2.55	0.8547	Agree

Level of Agreement of Male and Female Teachers on the Different Competencies of each Digital Domain

In the digital literacy domain, the computed mean for both male and female teachers were all interpreted as strongly agree. Under the ICT literacy, though both male and female teachers strongly agree, a significant difference exists between their levels of agreement. With this, the gender of the teachers affects their level of agreement on ICT literacy. Also, it was observed that the computed mean of male teachers for the ICT literacy exceeds that of female teachers. Thus, the ICT literacy of male teachers exceeds that of female teachers. This situation was the opposite for the learners. As for information literacy, no significant difference existed between the level of agreement of male and female teachers. Thus, this competency was not affected by the gender of the teachers.

In the digital safety and resilience domain, it was observed that all of the computed means for both genders were said to be strongly agree. For the first three competencies, the said similarity was supported by accepting the null hypothesis that no significant difference existed between the agreement of male and female teachers on these competencies. This was different from the digital resilience of the teachers, where a significant difference existed between the level of agreement of male and female teachers. Thus, gender can be said to have an effect on the teachers' digital resilience. Also, since the computed mean for the male teachers was higher than that of the female, then, it means that male teachers had a higher digital resilience than female teachers.

Under digital participation and agency, it can be seen that the level of agreement of male teachers on interacting, sharing, and collaborating was strongly agree while agree for female teachers. This difference was said to be significant. With a higher computed mean, the male was said to have a higher ability to interact, share data and information, and collaborate with others using digital technologies than female teachers. As for civic engagement and netiquette, no significant difference in the level of agreement between male and female teachers was observed. This implied that civic engagement and netiquette were not affected by the teacher's gender.

As for digital emotional intelligence, this was only the domain where the levels of agreement of male and female teachers on all its competencies were seen to have no significant difference. Thus, the digital emotional intelligence of the teachers was not affected by their gender.

For the last domain, which was digital creativity and innovation, it can be seen that the computed mean for male and female teachers had different descriptive equivalents. The difference between the agreement of male and female teachers seen under creative literacy was said to be significant while not significant for the expression. The table also shows that the computed mean for male teachers was higher than that of female teachers. With this, the creative literacy of male teachers can be seen to be higher than that of female teachers. As for the expression, this was not affected by the teachers' gender.

There were significant differences in the male and female teachers' level of agreement on their digital citizenship in all domains except for digital emotional intelligence. Thus, the hypothesis was negated. In particular, four competencies, namely: (1) ICT literacy; (2) digital resilience, (3) interacting, sharing, and collaborating; and (4) creative literacy, appeared to be the differences between male and female teachers. Some teachers needed assistance operating ICT hardware and software that proved useful during online classes. Most notably, before the pandemic, when in-person teaching methodologies were used that did not necessitate considerable technological integration in the classroom unless the subject they were dealing with entailed computer laboratory classes such as computer subjects and robotics. Teachers also admitted that their digital resilience needs to be improved. They needed help

improving their capacity to engage with others, share data and information, and work with others using appropriate digital technologies to achieve common goals. Finally, teachers expressed a need for help with skills and tools for creating, adapting, and curating digital content. Except for digital literacy, all three pertained to handling technology. The differences between male and female teachers might serve as a basis for future in-service training for each department and professional learning community sessions in each subject area. Due to the peculiarity of subject areas, it would be beneficial to contextualize the technology selections.

Table 4 Mann-Whitney Test on the Level of Agreement of Male and Female Teachers on Digital Citizenship

Domain	Competencies	Gender	Mean	Descriptive Equivalent	p-value	Interpretation
Digital Literacy	ICT Literacy	Male	3.72	Strongly Agree	0.023	Significant
		Female	3.47	Strongly Agree		
	Information Literacy	Male	3.62	Strongly Agree	0.087	Not Significant
		Female	3.39	Strongly Agree		
Digital Safety and Resilience	Understanding Child's Rights	Male	3.88	Strongly Agree	0.330	Not Significant
		Female	3.95	Strongly Agree		
	Personal Data, Privacy, and Reputation	Male	3.87	Strongly Agree	0.893	Not Significant
		Female	3.84	Strongly Agree		
	Promoting and Protecting Health and Well-being	Male	3.46	Strongly Agree	0.527	Not Significant
		Female	3.30	Strongly Agree		
	Digital Resilience	Male	3.72	Strongly Agree	0.039	Significant
		Female	3.41	Strongly Agree		
Digital Participation & Agency	Interacting, Sharing, and Collaborating	Male	3.48	Strongly Agree	0.024	Significant
		Female	2.98	Agree		
	Civic Engagement	Male	2.94	Agree	0.111	Not Significant
		Female	2.50	Agree		
	Netiquette	Male	3.73	Strongly Agree	0.611	Not Significant
		Female	3.71	Strongly Agree		
Digital Emotional Intelligence	Self-awareness	Male	3.56	Strongly Agree	0.217	Not Significant
		Female	3.39	Strongly Agree		
	Self-regulation	Male	3.56	Strongly Agree	0.430	Not Significant
		Female	3.50	Strongly Agree		
	Self-motivation	Male	3.54	Strongly Agree	0.122	Not Significant
		Female	3.34	Strongly Agree		
	Interpersonal Skills	Male	3.10	Agree	0.640	Not Significant
		Female	2.99	Agree		
	Empathy	Male	3.10	Agree	0.774	Not Significant
		Female	2.99	Agree		
Digital Creativity and Innovation	Creative Literacy	Male	3.32	Strongly Agree	0.033	Significant
		Female	2.88	Agree		
	Expression	Male	2.76	Agree	0.405	Not Significant
		Female	2.46	Disagree		

Initiatives of the University of Baguio in Fostering Digital Citizenship

Information Dissemination. Parents and Learners' Orientation was also conducted at the beginning of the school year, where information about the school processes, calendar of activities, policies, and others. Infographics were posted on the school's website and Facebook page for easy online access. Details such as video recording, documents, and images were uploaded to the parents' and learners' Google classroom created by the class adviser.

In UB's basic education, the K-12 curriculum was used and adhered to using the Department of Education's standards. Each school developed a subject-specific syllabus while including the university, schools, and department's vision, mission, and objectives. The subject teacher chose the strategies/approaches/methodologies to apply in conjunction with the assessments. The curriculum required by DepEd was adhered to by including digital skills as necessary for the subject. The domains of digital citizenship were addressed in part according to their relevance to the subject matter. A well-defined program addressing all domains must be discussed how these skills will be developed given what they already exhibit.

Policies, Procedures, and Guidelines (PPG). Additionally, the school or office heads develop policies, procedures, and guidelines (PPG) to ensure operational consistency and thus limit the likelihood of an undesirable event. Also, the PPGs were regularly assessed and revised as needed to establish a solid compliance culture.

Overall, UB's procedures were directed toward digital transformation, which entails digitizing processes and products to enhance all constituents' operations, teaching, and learning experiences. In education, digital transformation focuses on accessibility and increased engagement. The strategy chosen to accomplish this will influence which technologies will be employed to enable the school to achieve its goals. The Cognizant's framework by Dilmegani (2022) was a helpful guide in addressing the school's digital

transformation that requires four major components: customer relations, processes and systems, products and services, and organization.

In general, digital citizenship application was embedded and continues to improve in various educational and office operations in UB. Still, it was not as explicitly elaborated as stipulated in the five digital citizenship domains.

Conclusions and Recommendations

Digital infrastructure in UB basic education is present even before the pandemic. The acquisition and use of digital technology are driven by learning and teaching goals rather than a specific technology.

Accelerated access to digital devices increased drastically because of online learning settings. The most crucial access points for students to continue learning and teachers to fulfill their roles are the availability of digital devices set up in their homes, including mobile devices that allow learning to continue anytime, anywhere. Learners' access to digital devices varies but is evident regardless of gender or grade level.

Learners' usage of digital devices in terms of time, internet usage, influencers, and purpose promote self-regulated learning, reinforced by active engagement in subject-specific activities. However, evidence suggests that time is a factor when balancing the various purposes of using digital devices, which do not always translate into more effective learning. Nevertheless, the family and teachers have a strong influence no matter how adaptable individuals are in using computers and the internet. Additionally, parents play a key role in promoting students' digital citizenship by establishing home environments and mindsets that enable their children to embrace the role of digital creators rather than just digital consumers.

Concerning the learners' level of agreement with the practice of five domains of digital citizenship: Firstly, digital literacy was eminent when learners' access to and use of digital devices was evident in their ability to manage and operate devices, as well as to search for digital information in order to make educated decisions. Secondly, while the learners were knowledgeable about protecting themselves online, they required appropriate assistance in promoting and protecting their health and well-being. Thirdly, as self-assessed, the ability to interact, participate, and positively affect society through ICT use was limited in terms of interacting, sharing, and collaborating, including civic engagement. Fourthly, while their ability to recognize, navigate and express emotions in digital intrapersonal and interpersonal interactions demonstrated that they were self-aware and self-motivated, their limited interpersonal skills, empathy, and self-regulation required additional exposure to practice consistently. Finally, there is a need for growth in their abilities to express and discover themselves through ICT tools for content creation and expression. Overall, significant disparities in the application of digital citizenship competencies existed between males and females and across grade levels. However, females had a higher mean than males across the five digital citizenship domains and all sixteen of its competencies except for civic engagement.

Digital expression, civic engagement, creative literacy, interpersonal skills, empathy, interacting, sharing, and collaborating were identified as the teachers' areas of improvement in their application of digital competencies throughout the five domains. Between male and female teachers, there were gaps in ICT literacy, interacting, sharing, collaborating, digital resilience, and creative literacy that need to be addressed to assist learners' digital skill development. In all, males have a higher mean than females in their level of agreement across fifteen competencies under the five digital citizenship domains. Of which, only four had significant differences.

In addition to the University of Baguio's continuing digital transformation, existing programs to develop digital citizenship are in place and are updated regularly to meet the clients' needs.

Fostering digital citizenship in UB Basic Education can be realized through the following recommendations:

1. Each school and family must enhance its digital devices and infrastructure to aid the learner in having multiple access points primarily to learn and practice digital citizenship skills.

2. Parents, teachers, learners, and peers must continue to influence each other in the responsible use of digital devices. Schools must continue to encourage discovery, expression, and learning through it.

3. Considering the females with higher digital citizenship level of agreement than male learners targeted support to their strengths and intervention to their weaknesses should be employed and must promote gender-responsive programs. However, regardless

of gender differences, learners must practice collaboration to encourage broad engagement and be open to experimenting with ways to develop creativity. An integral part of growth is a whole-school approach that promotes and supports all learners' exploration to develop digital creativity and innovation. Youth-led initiatives help build digital participation and agency. Other domains to accentuate are digital safety and resilience, which go hand in hand with digital emotional intelligence.

4. Differences between female and male teachers in their digital citizenship level of agreement must be addressed with gender-sensitive opportunities to fully utilize their skills and competencies. School administrators must continue to support their teachers in their professional development and training using the UNESCO DKAP framework in relation to a broad range of digital citizenship competencies, particularly digital creativity and innovation. Schools should undertake information dissemination and training initiatives like the TPACK model aimed at all the key players who are likely to have diverse needs and capabilities to be responsible digital citizens, which could be included in the school's faculty development plan.

5. Each school needs to integrate opportunities to explore and incorporate elements of digital citizenship into its curriculum, considering gender and grade levels. Evidence-based policy development must reflect learners' diverse strengths, needs, and progress. SWOT analysis can be carried out for in-depth evaluation.

6. A periodic study on learners' digital behaviors, perceptions, and attitudes is needed and will be useful for decision making, developing, implementing, and educational interventions. It is always important to monitor the impact on learning of any new approach.

7. Studies must be continuously conducted to realize the educational performance, social behaviors, and connections digital technology brings.

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