Research Article

Assessing the Role of Screen Time and Digital Literacy in Student Learning at Learning Circle Inc., Olongapo City

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ABSTRACT

This research investigated the relationship between screen time and digital literacy of elementary students at Learning Circle, Inc., Olongapo City, Philippines after the excessive use of digital tools brought by COVID 19. A descriptive-correlational type of research design was used with 102 students who were surveyed through Likert-scale questionnaire. Students' screen time exposure was of a moderate level, with the mean screen time exposure score 2.74 (SD = 0.80). In the aspect of digital literacy, students have an acceptable level with the overall mean 2.85(SD =0.73). Statistically significant differences were found between age and grade when analysed via ANOVA in screen time exposure and digital literacy. In particular, there was a segregation in the adoption of screen time exposure by age ($F(8, 93) = 4.058$, $p < 0.001$) and scholarship level ($F(5, 96) = 4.683$, $p < 0.001$). However, there was no significant sex difference observed ($F(1, 100) = 0.122$; $p = 0.727$). There were statistically significant, positive correlations between screen time exposure and e-literacy ($r = 0.710$, p-value < 0.001) showing in Pearson correlation analysis.). These results suggest that increased levels of screen time may stimulate the acculturation in digital literacy and call for equitable usage in educational settings. The results of the research have significant implications for educators and policy makers on how to effectively incorporate technology into the classroom as a means of promoting positive amounts of screen time.

Keywords: *Screen Time, Digital Literacy, Student Learning, Technology Integration, Educational Policy*

Background

Technology and education come together nowadays in contemporary's classrooms, where we have shifted from the typical lecture classrooms to 'active learning' classrooms. The hacking of the digital learning instruments, tools and platforms changed how knowledge penetrates or embedded and was absorbed;

improving interaction with the educational materials. But with these technological gifts come a set of challenges, especially around the 'time spent' trade-off and promoting critical digital literacies. Being digitally literate – that is not just the ability to use digital technologies effectively but also an ability for critical engagement with technology and capacity for thinking about how people interact with technology – has become one of the key skills within contemporary educational context, and for both students and staff. As mentioned by Atmazaki and Indriyani (2019), digital literacy is necessary as human preparation towards the interconnected digital environment.

During the recent past, there has been a notable increase in screen time for all ages and how that may impact students' education. For example, a 2019 Common Sense Media report revealed that U.S. teens (ages 8-18) are spending more than seven hours daily on screens for entertainment (excluding any educational use). Compiled the following list to share for two reasons: This development is growing and we need more studies on how excessive amounts of screen time effects children s physical, emotional and cognitive growth. In the domain of primary education, due to increasing availability of digital devices much is said about its impact on students' learning and development—more specifically in the context of digital literacy. The American Academy of Pediatrics (2020) acknowledges that a certain amount of screen time can benefit learning, but fears about the effects of too much screen usage, such as reduced attention spans and social isolation are widespread (Twenge & Campbell, 2019).

And when we're living at a time such as today, in which digital literacy ranks right up there with reading, writing and arithmetic as prerequisites for students to succeed (especially those who are only beginning to read, write and do sums), it's just as important that they be able to move themselves around in that digital space efficiently. These abilities are, for example, critical thinking combined with responsible online behavior and the ability to judge digital content (Purcell et al., 2019; Ribble, 2019). In the context of Filipino scenes, screen time and digital literacy intersect in a

field for concern particularly after that of COVID-19 when varied levels — online platforms that is—have been leant to adjust for integration of online learning. The rapid transition to digital formats on screens during the pandemic has generally cast doubt about potential longer-term effects of increased exposure and hours in front of screens on children's development outcomes and online skills.

Olongapo City, where Learning Circle Inc. is situated, provides a rich setting for studying the impact of screen time on children's digital literacy skills. For Olongapo, the emerging urban city of the Philippines, there is little that does not speak about progress in educational technology on private schools as far as technological integration to education is concerned. But as that reliance on screen learning becomes more pervasive, parents and teachers have expressed concern about effects on their students' cognitive and social development. These fears are similar to what Lonzon et al. (2024), with high school students from Subic, regarding the psychological and behavioural consequences of making excessive use of screens. It found that high screen time was associated with more anxiety, less success at face-to-face communication, and attention problems.

Espiritu (2021) study further pointed the need to expand vehicle training about digital literacy on curriculum integration. Espritu emphasized that teachers in the schools should not only be tech-savvy but also lead students into responsible and critical digital citizens.

The purpose of this research was to establish the relationship between screen time and digital literacy among elementary students in Learning Circle Inc Olongapo City. The examination of students' learning achievements this study brings some enlightening conceptions for further educational efforts. The findings from this study adds to the broader dialogue about technology and learning through exploration of problems and possibilities surrounding screen time and digital literacies. The results also offer an imperative lesson to local educational stakeholders and teachers on preparing students not simply to achieve in a world that is increasingly digital, but to make them wise and safe from the dangers of too much screen time, according to the US fund.

Methods

The researcher used the descriptive-correlational research design to determine the relationship of screen time exposure and digital literacy skills of elementary students at Learning Circle, Inc. Olongapo City. We opted for this design to describe and analyse the potential relationship between screen time and digital literacy without intervening on variables. The specific objectives of the study were to find out (1) how demographic variables (age, sex and grade level) are related with young people's exposure to screen media and digital literacy; and (2) whether higher degree of children's access to screen media was proportionately linked with better development of Canadian youth.

The participants in the research were 102 elementary pupils from Learning Circle, Inc.-Private School of Olongapo City. Universal sampling was used to ensure that all school children in the elementary department had an equal probability of being included in the study, thus reducing sampling bias and promoting representation. The pupils were from 6 to 15 years old, in class 1–6.

Responses were obtained through a Likert-type survey questionnaire divided into three parts: demographic characteristics (age, gender, grade), exposure to screen time and digital literacy. The screen time exposure sub-scale (Narciso and Flores, 2023) inquired about the time they spent involved in activities such as studying with digital devices, playing video games and using social networks. It was based on a 4-point scale (1 = Never Exposed, to 4 = Very Much Exposed) with higher scores reflecting more frequent screen exposure. The digital literacy sub-scale, derived from Baterna and Rogayan (2020), measured the learners' skill to use digital tool responsibly, their ability to identify online hazards and criticisms of digital medium. This subsection also adopted a 4-point scale ranging from 1 = Very Poor to 4 = Very Good, the higher score representing the higher degree of digital literacy. Cronbach's alpha confirmed the reliability of the instrument (0.771 for screen time exposure and 0.904 for digital literacy), as they revealed good-to-excellent internal consistency.

Data Colelction was collected during the 2024-2025 school year. The survey was conducted in the classroom, after receiving approval from school authorities and informed parental consent for young teenage students. Data were collected, compiled and analyzed with MS Excel and SPSS. Screen time exposure and digital literacy were summarized using mean and standard deviation, as well as descriptive statistics. ANOVA was used to test the differences in screen time and digital literacy among demographic groups. Then, Pearson's correlation coefficient was utilized to determine the direction and strength of linear association between exposure to screen time and digital literacy. Results A significant positive correlation ($r = 0.710$, $p < 0.001$) between the variables was found showing that greater exposure to screen time is proportionally associated with higher digital literacy levels.

Result and Discussion
Profile of the respondents

It was hypothesized in this study to be associated with the screen time and digital literacy of the students.

Table 1. Profile of the respondents

Sex	F	Percentage
Female	55	53.90
Male	47	46.10
Age		
6 – 7	27	26.47
8 – 9	32	31.37
10 – 11	33	32.35
12 – 13	8	7.84
14 – 15	2	1.96
Grade Level		
Grade 1	14	13.7

Grade 2	13	12.7
Grade 3	15	14.7
Grade 4	18	17.6
Grade 5	15	14.7
Grade 6	27	26.5

The age distribution of the respondents shows that most (32.35% or 33 out 102) in the range of 10-11 years, and 31.37% (32 out of 102) are between ages of 8–9. Only a few of the respondents (7.84%) were aged 12–13 years and not all of them (1.96) out of 102 belonged to the age group of 14–15 years. This bias toward the younger age groups may be due in part to the fact that younger students are more likely to participate in educational surveys (Pew Research Center, 2021). The relatively lower amount of older students (14-15 years) involved in YouTube activities can also mean that this age group may be more interested on, for example, gaming or chat online rather than seeking to do academic related research, which could limit their interest to explore other types of topics further some reports from Common Sense Media (2023)).

The sample was composed by 53.90% of male participants (55/102) and 46.10% female participants (47/102). Both female childhood and adolescent groups have also increased screen exposure, which can be linked to anxiety or depression (Twenge & Campbell, 2019; Keles et al., 2020). Digital literacy diverges by gender as well, with the male participant often playing digital games more and increasing screen time compared to female participant, whereas the female is usually using technology for educative aim or socializing (Chen & Dembo, 2007; Chen, Wang & Smith, (2022). This is in line with findings of previous research which considers digital literacy as a factor affecting the way technology is used (Hsieh, Wu, & Tsou, 2021; van Deursen & van Dijk, 2020).

According to grade level, 26.5% (n =27 of 102) of the subjects were in Grade 6, and 12.7% (n=13 of 102) in Grade 2. The higher percentage in upper elementary level students, especially the 6th graders, may indicate that they are more accustomed and have been exposed to using technology academically. Younger

Table 2. Level of Students' Screen Time

children, however (e.g., second graders), are more likely to use technology passively and play on screens as opposed to engage with educational content on them (Hinkley et al., 2020; Strasburger, Jordan & Donnerstein, 2020). This age-related disparity in screen use can also be the reason younger students do not possess the critical skills to critically evaluate digital content and effectively mitigate online risk, which is worse off for lower grade students (Higgins, Xiao & Katsipataki, 2021).

Students' Screen Time

With the COVID-19 pandemic, schools moved to online learning, and this brought about a change in students' methodology and approach to education. As classes shifted online, students relied more and more on digital devices in order to accomplish their academic work, like attending virtual lectures, doing homework, joining online forums etc. This drastic change has been linked to a permanent rise in the number of hours that both children and youngsters spend looking at a screen, not only for reasons of study but also to meet others, entertainment and for their free time. The use of screen time increased gradually as students began to use these devices, and the screen time regularly surpassed that for a healthy exposure. This additional screen time has raised questions about how it could impact on the physical health of students, including eye strain from prolonged exposure to a screen, poor posture and changes in sleeping habits, psychological problems due to increased stress and social isolation. The rapidly growing use of screens inevitably demands deeper knowledge about its final effects and emerging approaches to solving the negative consequences, which is closely linked with the well-being and development of young individualsIn this context we must mention that (Dorn et al., 2020).

Students' Screen Time	Mean	SD	VI
1. I study with technological devices.	2.79	0.75	Exposed
2. I watch instructional videos on the internet.	2.67	0.75	Exposed
3. I utilize my devices to read helpful academic papers.	2.80	0.75	Exposed
4. I utilize technology to do duties connected to my studies.	2.84	0.67	Exposed
5. I spend more time utilizing technology for educational and helpful objectives.	2.63	0.74	Exposed
6. I play internet video games on my gadgets.	2.90	0.85	Exposed
7. I frequently watch K-dramas and other films.	2.41	0.95	Exposed
8. I watch videos online that aren't instructional a lot.	2.75	0.85	Exposed
9. I use social media on my devices more often.	2.85	0.76	Exposed
10. I use technology for non-educational purposes more often.	2.73	0.83	Exposed
Overall Weighted Mean	**2.74**	**0.80**	**Exposed**

The data suggests that students experience moderate screen time exposure, with a weighted mean of 2.74 (SD = 0.80) overall – rated on the classification scale as "Exposed". Being classified into this category means that students are neither blocking out all technologies nor overusing them. The playing of internet video games (M = 2.90) and the use of social media (M = 2.85) were resulting in the highest exposure, whereas studying with technological devices (M = 2.79), reading academic papers (M = 2.80), formulating thoughts on the coursework content at home M= 2.84) etc., cause lower levels of our sample to be exposed to Wi-Fi radiation during their learning periods in school settings specifically when compared to their homes or other school environment factors where playing more computer games was a significant factor too promoting exposures. EmergingType 1 and RoleType are also associated with watching other kinds of entertainment non-instructional videos (M = 2.75) or K-dramas (M = 2.41), however, which is not surprising considering that they are young people who spend a lot of time on computer-based media activities in general.

"Exposed" emphasizes a good amount of access to screens, meaning children use technology on an everyday basis, however not primarily for educational purposes but mostly for entertainment. This aligns with other research, where the Common Sense Media Report (2020) found only 25% of children were using technology for academic practice and 60% to entertain. One of its well quoted numbers is the 70% that reads most students spend more time on TikTok and Fortnite (Pew Research Center, 2022) than learning.

So overall, despite student use and investment in technology for their learning being apparent throughout this research, a recreational screen time more than academic one seems to dominate the usage, which calls for schools to have targeted digital presence where recreation is balanced with learning.

Digital Literacy

On the basis of all students' weighted mean scores in terms of all three factors being 2.85 (SD = 0.73), it seems that, on average, students are digitally literate; they are informed about digital technology to use it ethically. The "Acceptable Level" rating indicates that you are competent at a modest level in competitive digital dimensions.

Proficiency in digital communication skills (M = 2.99), protecting devices and recognizing online threats (M = 2.95), and delivering instruction through multimedia (M = 2.90) are evidence among students. They also indicate an awareness of media construction and information sharing (M = 2.88) and cultural diversity and online safety (M = 2.81). Although their level of digital-conversation skills (M = 2.34) is about average, their concepts and constructs for constructive and professional use of ICTs are somewhat limited in terms of self-expressive uses for engaging with digital media (M = 2.72, M = 2.71).

As Eshet-Alkalai (2019) insists, digital literacy is an important skill in order to treat the world we live in today – a technology based society, it is essential for one to be a responsible digital citizen and support lifewide learning. Studies suggest that digital literacy is associated with academic achievement, and future job readiness (van Deursen & van Dijk, 2020).

Evaluating and selecting digital information critically (Bennett & Maton, 2019) represents one of the most important outcomes of students' development of digital literacy.

In general, students' digital skills are high enough to perform well in both academic and everyday life digital worlds.

Table 3. Level of Digital Literacy

Digital Literacy	Mean	SD	VI
1. Own gadgets (laptops, mobile phones, etc.) should be protected, and online dangers and threats should be recognized.	2.95	0.74	Acceptable
2. Recognize the methods and motivations used in the creation of educational media messages.	2.88	0.74	Acceptable
3. Apply a basic knowledge of the moral and legal concerns related to media analysis.	2.80	0.72	Acceptable
4. Provide educational information in a variety of mediums, such as multimedia.	2.90	0.74	Acceptable
5. Use technology and digital media to express yourself artistically.	2.72	0.74	Acceptable
6. Acquire knowledge about the dimensions of cultural diversity and develop the ability to safeguard oneself and others from potential online threats (such as cyberbullying, cybersex, etc.).	2.81	0.83	Acceptable
7. Engage using a range of digital tools and platforms.	2.71	0.65	Acceptable
8. Recognize acceptable digital communication techniques.	2.99	0.65	Acceptable
9. Utilize technology to gather, arrange, assess, and share information.	2.88	0.72	Acceptable
10. For educational reasons, become familiar with digital communication distribution, presentation, and management.	2.89	0.78	Acceptable
Overall	**2.85**	**0.73**	**Acceptable**

Difference in the level of screen time

In today's digital age, screen time is nearly inseparable from everyday life. However, there are large differences with respect to screen use between school years, gender and age group. This study will look at these differences and the role of mediators affecting time on screens. Such variations are informative for providing insight as to potential consequences of screen exposure across different domains of human life such as academic performance, psychological well-being or physical health.

Table 4. Difference in the level of screen time

Variable	F	p	df
Age	4.058	0.000	(8, 93)
Sex	0.122	0.727	(1, 100)
Grade Level	4.683	0.001	(5, 96)

Note: $p < 0.05$ indicates a statistically significant difference.

The comparison of differences in average screen time by age in sex and grade level provides several important findings. For one, there is significant variation in screen time across age $(F(8, 93) = 4.058, p =. 000)$ and grade level $(F(5,96) = 4.683, p =. 001)$, which means that the screen time increases over academic years. These results imply that digital engagement rises with age and educational requirements. The rise of the digital age has seen students become more and more dependent on technology for study AND socialising as they advance throughout school. This is also supported by the findings from previous studies conducted by Rideout, Foehr, and Roberts (2020), showing that young children are more exposed to digital media and have easier access. This was further amplified by COVID-19 which led to a dependence on screens for education too much (Mansoor, Younas & Majeed, 2021).

In contrast, no effect of sex $(F(1,100) = 0.122, p = . 727)$. This would seem to indicate that the gender gap in screen time is narrowing. Male and female students are now the same in playing social media games, using digital devices for school work. This is consistent with Domingues-Montanari (2017) also, who indicates that more equal exposure to technology and access opportunities has influenced a greater gender balance in screen time.

Thus, the difference in age and level $(F(5,96) = 4.683, p =. 001)$ also suggest that older students spend more time on screens, probably because with growing academic demands, they have a need to use more digital devices for school work, research and communication (Hinkley Carson & Teychenne 2020; Hale & Guan 2019). As students move up in school, their academic needs drive them to spend more time on screens for educational reasons, which adds to increased exposure to digital media.

In sum, the results highlight that age and grade are important factors of screen time, whereas sex showed no more such relevance in explaining digital engagement. This is in keeping with a general trend towards parity of male and female students' engagement digitally, as the use of technology is more evenly diffused throughout leisure and academic purposes.

Difference in the digital literacy

As the digital world continues to evolve, technology competence is increasingly being considered a survival skill in both academic and personal spheres. Digital literacy is indeed variegated in primary school populations. This variation can happen due to several factors such as age, sex and school grade.

Table 5. Difference in digital literacy

Variable	F	p	df
Age	2.609	0.013	(8, 93)
Sex	0.994	0.321	(1, 100)
Grade Level	3.813	0.003	(5, 96)

Note: **p** < 0.05 indicates a statistically significant difference

The analysis of the population difference in digital literacy by age, sex and grade leads to informative data on how the student's demographic variables influence their digital competency. 3.4 Variabilit.y in digital literacy _Table 1 across AGe The results demonstrates that there was a significant difference in digital literac y among different ages $(F(8,93) = 2.609, p=.$ on taskachievement $(F(1, 96) = 6.266, p <. 001)$ and level of education $(F(5,96)= 3.813, p =. 003)$ and age $(p = 0.002)$, indicating strong effects of the variables age group and educational level on students' digital literacy skills. This suggests that with the increasing age and achievement of students, digital skills can be developed by students, perhaps due to greater access to technology and academic requirements (Fisher et al., 2023; Kirkland et al., 2022). Upper elementary-school students in particular are likely develop in terms of digital literacy as they encounter more sophisticated technology and become involved in more complex curricular tasks.

However there was no significant sex difference, (F(1,100) = 0.994, p =. 321). This finding demonstrates that in our sample, epitomized students being male and female are equally digitally literate. This contrasts with previous research, which has found differences in tech use between males and females (Hale & Guan, 2021). Digital tools are now being adopted evenly by both boys and girls in our day – a sign that we are coming close to the equilibrium of digital use and participation among students.

These findings underscore the need for grade-level digital literacy programs and interventions that promote children's ability to effectively navigate a digital environment (Ananiadou & Claro, 2019). The finding of no gender distinction also suggests that it is taken for granted that digital literacy is presently an issue of practice not gender as much or more so the need for responsible and effective students in what has developed into a mainly digital world (Ribble, 2020). Overall, age and grade is one of the most influential variables in relation to digital literacy as gender hardly has any effect on students' motivation towards digital engagement pointing to a move towards inclusive digital competence.

Association between screen use and digital literacy. Young elementary students' screen use and digital literacyAs a leading factor, young children's' screen time has become important issue in education research as well as public discourse. The increasing use of digital screens by young children due to early encounters in technology, offers both opportunities and challenges for their learning and other developments. While time spent on screens can provide access to information and problem-solving opportunities related to 21st century skills, educators continue to ask about the type and purpose of students' digital use.

The youth should be allowed to the digital stuff, after all where we going live is digital world. However, the nature and amount of screen exposure whether visualisation or social media and/or passive entertainment are also important to consider for students' developing digital literacy. Understanding of this association is therefore critical for the creation of nuanced and purposeful digital learning experiences which promote responsible and meaningful technology use in children.

Table 6. Relationship between Screen Time and Digital Literacy

Variables		Digital Literacy
Screen Time	Pearson Correlation	.710**
	Sig. (2-tailed)	.000
	N	102

Note: **p** < 0.01 indicates a statistically significant correlation.

The results report an statistically significant and strong positive relationship between students' screen exposure time and digital literacy (r = 0.710, p =. 000). It suggest screen time literacy skills of children in the digital deluge are improved with greater exposure to screen-based operation. Indeed, this almost indicates that students who make more use of digital tools are more likely to master the skills to navigate in a digital environment - that is (among others) critically selecting and analysing information, reaching ethical decisions and acting responsibly online.

Despite the strength of the association, these results carry some implications for digital literacy and learning. While ST may improve digital competencies, the quality and nature of involvement is critical. As Li (2023) notes, it is not just a matter of more screen time that ensures advanced digital literacy. Instead, what we need to focus our attention on is design of screen and level interaction that transforms potential harm – passive consumption – into something designed to create value in terms of stability, growth and significance.So, while this research shows the beneficial relationship of screen time and DL as a challenge for education practitioners is to ensure that technological use is purposeful, interactive and active. This can help reduce the dangers of too much or unhealthy screen time – distractions, social isolation and so on – and promote more mature

and critical use of technology by students. "An ideal would appear to be a balance that integrates screen-based and offline activities in order to achieve holistic student development, maximizing the benefits of digital literacy while mitigating its harmful aspects" (Brown & Davis, 2024).

Conclusion

This study investigated the correlation of screen time and digital literacy among elementary pupils in Learning Circle, Inc., Olongapo City. The results present a moderate level of screen times in students (M = 2.74, SD =.80) meaning that although the students are clearly familiar with digital devices but their exposure is not too much as well. Students also reported a level of digital literacy (M = 2.85, SD = 0.73) that indicated they are reasonably familiar with how to use and navigate digital tools for both academic and social purposes, though this was a basic understanding at best.

There were significant age differences in the exposure to screen times (F(8, 93) = 4.058, p =. drive condition (F(1,21) = 37.32, p.000) and grade level(F(5,96) = 4.683, p =. 001), with older and higher grade children spending more time at screen. This is consistent with findings in the literature which indicate that students engage more digitally as they progress through their mode of study. However, there was no significant difference between males and females (F(1,100) = 0.122, p = 0.727), suggesting that male and female students are equally comfortable in their use of technology, and that girls now participate equally with boys in digital media use.

The between-screen time exposure and digital literacy were also found positively significant (r = 0.710, p = 0.000) thereby reinforcing the fact that the more screen time the children have; it is associated with improved digital proficiency. These results indicate that although screen time has a potential role in digital literacy development, quality and nature of the activity behind the screen is important. According to Li (2023), mindful screen-time, such as educational games and interactive media is critical for the development of digital literacy.

Finally, a balanced approach to screen time for developing digital literacy is advocated by the study. technology in meaningful, purposeful ways that showcases product-based screen time as well as engaging the children in off-line activities which can provide for a more holistic growth. These results add to the ongoing discussion on technology use in education and offer insights for educators, school leaders and policy makers seeking to create more equitable technology-enabled learning spaces.

Acknowledgement

References
Ananiadou, K., & Claro, M. (2019). *21st Century Skills: Why Students Need Them and How to Teach Them*. OECD Publishing.

Atmazaki, N., & Indriyani, V. (2019). Digital Literacy Competencies for teacher education students. Proceedings of the 1st International Conference on Education Social Sciences and Humanities (ICESSHum 2019). https://doi.org/10.2991/icesshum-19.2019.156

Baterna, H. B., Mina, T. D., & Rogayan, D. V. (2020). Digital literacy of STEM senior high school students: Basis for enhancement program. International Journal of Technology in Education, 3(2), 105-117. https://doi.org/10.46328/ijte.v3i2.28

Bennett, S., & Maton, K. (2019). Beyond the 'digital natives' debate: Towards a more nuanced understanding of students' technology experiences. *Journal of Computer Assisted Learning*, 35(5), 573-680.

Bhandari, P. (2021, July 7). Correlational research | When & how to use. Scribbr. https://www.scribbr.com/methodology/correlational-research/

Brown, A., & Davis, L. (2024). Engaging Students through Interactive Screen Time. *International Journal of Technology in Education*, 15(1), 45-60.

Chen, Y., Wang, Y., & Smith, J. (2022). Gender differences in digital gaming engagement: Implications for digital literacy. Journal of Educational Technology, 29(2), 90-104.

Domingues-Montanari, S. (2017). Children, adolescents, and screens: A social perspective. *Journal of Child Psychology and Psychiatry*, 58(11), 1227-1229.

Dorn, E., Hancock, B., Sarakatsannis, J., & Viruleg, E. (2020). COVID-19 and student learning in the United States: The hurt could last a lifetime. *McKinsey & Company*.

Espiritu, Raymond. (2021). AWARENESS AND COMPETENCY OF PRE-SERVICE TEACHERS ON THE PHILIPPINE PROFESSIONAL STANDARDS FOR TEACHERS (PPST): A BASIS FOR TRAINING PROGRAM. Vol. 7 No. 11. 83-105. 10.17605/OSF.IO/FY8MC.

Eshet-Alkalai, Y. (2019). Digital literacy: A conceptual framework for survival skills in the digital era. *Journal of Educational Multimedia and Hypermedia*, 28(1), 25-40.

Fisher, D., Frey, N., & Hattie, J. (2023). *Visible Learning for Literacy, Grades K-12: Implementing the Practices That Work Best to Accelerate Student Learning*. Corwin Press.Hale, L., & Guan, L. (2019). Screen time and sleep among school-aged children and adolescents: A systematic literature review. *Sleep Medicine Reviews*, 47, 51-57.

Hale, L., & Guan, L. (2019). Screen time and sleep among school-aged children and adolescents: A systematic literature review. *Sleep Medicine Reviews*, 47, 51-57Higgins, S., Xiao, Z., & Katsipataki, M. (2021). The Effects of Digital Technology on Learning: A Review of the Evidence. *Education Sciences*, 11(4), 176.

Hinkley, T., Carson, V., & Teychenne, M. (2020). Screen Time and Young Children: What the Research Says. *Journal of Pediatrics*, 87(2), 250-258

Hsieh, P., Wu, K., & Tsou, W. (2021). Exploring the relationship between digital literacy and mental health outcomes among university students. International Journal of Medical Informatics, 148, 104392.

Keles, B., McCrae, N., & Grealish, A. (2020). A systematic review: The impact of social media on mental health in adolescents and young adults. Journal of Youth and Adolescence, 49(6), 1067-1083.

Kirkland, L. E., Wiest, L. R., & Grant, C. M. (2022). The Impact of Technology-Infused Instruction on Student Learning: A Cross-Grade Analysis. *Journal of Education and Learning*, 11(1), 21-31.

Khosravi, S., & Sadeghi, H. (2022). Digital literacy in the educational context: Current perspectives and future directions. *Education and Information Technologies*, 27(3), 2853-2871.

Li, Z. (2023). Optimizing Screen Time for Effective Learning: Best Practices and Strategies. *Academic Journal of Pedagogy*, 9(1), 19-29.

Lonzon, Miriam & Espiritu, Raymond. (2024). Phenomenological Behavioural Problems Manifested by High School Students Enrolled in Subic. International Journal of Multidisciplinary Applied Business and Education Research. 5. 3411-3421. 10.11594/ijmaber.05.08.34.

Mansoor, N., Younas, M., & Majeed, A. (2021). Impact of COVID-19 on screen

time in children: A systematic review. *Asian Journal of Psychiatry*, 56, 102550.

Narciso, N. S. N., & Flores, G. B. (2023). Screen-time activity and academic productivity of students. Asian Education, 2(1). https://lynnp.org/index.php/ae/article/view/41

Ribble, M. (2019). Digital Citizenship in Schools: Nine Elements All Students Should Know. *International Society for Technology in Education*.

Ribble, M. (2020). Digital Citizenship in Schools: Nine Elements All Students Should Know. *International Society for Technology in Education*.

Rideout, V., Foehr, U., & Roberts, D. (2020). *Generation M2: Media in the lives of 8- to 18-year-olds. The Henry J. Kaiser Family Foundation*.

Strasburger, V. C., Jordan, A. B., & Donnerstein, E. (2020). Children, Adolescents, and the Media: Society for the Study of Emerging Adulthood. *New York: Sage Publications.*

Twenge, J. M., & Campbell, W. K. (2019). Media Use is Wrecking Kids' Lives. *The Atlantic*.

Van Deursen, A. J. A. M., & Van Dijk, J. A. G. M. (2020). Internet skills: Necessary conditions for internet use. *In Digital Technology and Social Change* (pp. 1-17). Routledge.Wong, G. K., & Divecha, M. (2020). Digital literacy: The key to equitable, inclusive education in a digital age. *International Journal of Information and Education Technology*, 10(1), 59-62