

Digital Literacy of School Health Influencers in Enugu State, Nigeria

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Abstract

This descriptive survey examined the level of digital literacy of School Health Influencers (SHIs) in Enugu State, Nigeria. A total number of 2028 volunteers from secondary and tertiary institutions including: health educators, counselors, nurses, dieticians and adult educators were conveniently recruited in the study. Data collection was by means of self-structured Digital Literacy Questionnaire. Mean, standard deviation and analysis of covariance were used for data analyses. The findings revealed that the SHIs generally had moderate literacy level ($\bar{x}=2.45$); male respondents had higher mean scores ($\bar{x}=2.46$) in digital literacy compared to their female counterparts ($\bar{x}=2.46$); SHIs with 25 years and above work experience had the highest grand mean scores ($\bar{x}=2.52$) compared to respondents with 13-25 years of work experience ($\bar{x}=2.46$) and those with the least years of work experience ($\bar{x}=2.44$); and participants with higher levels of education had more mean score than their counterparts with lower education. The ANCOVA test revealed a significant difference in digital literacy scores based on gender ($F = 5.803$; $P < 0.05$), years of work experience ($F = 4.567$, $P < 0.05$), and level of education ($F = 9.848$, $P < 0.05$), but not based on nature of job ($F = 0.691$, $P > 0.05$). Among other things,

capacity building for the SHIs was recommended by the present researchers.

Introduction

Information and communication technology is growing in its importance and currently considered as a bedrock for social engagement and educational achievements. It makes it easier for teaching and learning of even the most abstract and complex concepts through multimedia and various digital options. That is why it is considered very essential especially in contemporary education (Faga & Nwachukwu, 2022). Another important characteristic of ICT is its ubiquity, a feature that enables information acquisition or sharing as well as virtual communication among people everywhere and every time through audio-visual and textual means. In this, people at various remote ends can communicate seamlessly as though they are physically close (WahId, Farooq & Aziz, 2021). The above features make ICT very crucial considering the challenges that bedevil the current day education leading to constant school closure. It will enable the schools to continue to carry out their vital roles of curriculum contents' delivery and health promotion of the youngsters, especially now that there are so many reasons for school closure.

In recent times, Nigerian schools have often been closed because of disease outbreaks (Eze, 2018; Dessy, Gninafon, Tiberti & Tiberti, 2021; Ugwu, 2021; Ogeniyi, 2022), insecurity including: mass kidnapping of school children and staff (UNICEF, 2022), and industrial actions by educational institutions (Okangla, 2022; Wahab, 2022; News Agency of Nigeria, 2022). Since 2020, kidnapping alone have been responsible for the closure of about 11,536 schools (UNICEF, 2022).

School closure comes with health consequences. While idling at home, the youngsters are exposed to numerous unhealthy experiences. For instance, a study conducted during COVID-19 lockdown reported that the girls are more likely to stay with boys and men during this time than any other time, and are more exposed to all manners of sexual risks when they are homebound (World Vision International, 2020). There are other pieces of evidence from previous studies to show that when people are idle, there is an increase in the volumes of alcohol bought and consumed (Fairbairn & Sayette, 2014), a rise in drug abuse (Hawkley & Cacioppo, 2010), increase in cigarette smoking (Dyal & Valente, 2015), increased sedentary living and poor dietary behaviours (Tully, McMullan, Blackburn, Wilson & Coll-Planas, 2019; WHO, 2020), and increase in cases of domestic violence (WHO, 2020). Therefore, continuous school closure as seen in Nigeria will lead to an explosion of public health crises if intervention designed to consistently avail healthful pieces of information to the children and young people are not provided. Schools have a role to play in this regard through school health influencers.

An influencer is described as a professional who has specialized knowledge or insight into a given subject, and is capable of influencing people's opinions on the basis of this specialty (Bright Edge, 2022; Sprout Social, 2022). In this paper, we regard health influencers as people who have special training in the areas related to health promotion and prevention, and who are capable of earning people's trusts and influencing their knowledge, attitudes and behaviours for better health outcomes. Therefore, school health influencers (SHIs) are those who perform the above outlined

roles for the benefits of school community. They include: health educators, school counselors, school nurses, adult educators and school dietician.

The roles of SHIs in promoting the health of school children and youths are numerous. Early stage of life is a critical period that requires constant guidance to ensure that young people always make informed decisions about their health (Ugwu, Onyekwere, Anibueze & Familoni, 2021). According to Dhami (2020), millions of today's young people are drugs addicts, involving in various crimes and delinquencies, dropping out of school, engaging in suicidal behaviours, and suffering from depressions and anxieties. Dhami added that owing to these challenges, they are often confused, and since they are not mature enough to handle some of these issues, they might engage in self-harming trial-and-error which may cause them to become social misfits in later life. Therefore, school counselors can make the young people overcome these challenges by assisting them with their emotional, intellectual and social development as well as promoting self-advocacy in them that will enable them solve their problems independent of their parents (Beverly Hills Therapy Group, 2021). School nurses, on their own part, have great influence in school community's health (Mazyck, Cellucci & Largent, 2015). A school nurse, through promotion of secure and safe environment in schools, is an indispensable advocate for the health and well-being of all students (National Association of School Nurses (2015). Another important school health influencer is the dietician. Dieticians empowers children with knowledge and skills which enable them to make healthy food and beverage choice (Centre for Disease Control and Prevention, 2021a)- Finally, school community health can also be promoted through adult education (Lopes, 2018) and health education (Centre for Disease Control and Prevention, 2021b). Therefore, in the event of unplanned closure of schools, all of the above benefits are thwarted and this comes with myriads of unwanted health consequences for the students, schools and society (UNESCO, n.d., Jahan, Zviedrite, Gao, Ahmed & Uzicanin, 2021). The only way the SHIs will continue health promotion among the students in the light of consistent closure of schools in Nigeria is through virtual means, and this requires being digitally literate.

Digital literacy (DL) is the possession of skills that enables one to functionally operate in a society where digital tools including: social media, internet, and mobile devices are major means of information and communication (Western Sydney University, 2020). The present study regards DL as the possession of understanding of the workings of various computer components and applications as well as the ability to use them effectively and safely for generating, manipulating, saving, retrieving and sharing information through different social media. To be digitally literate according to Lin (2011), one has to be: (1) skilled in use of Microsoft processing software like Word, Power Point and Excel; (2) conversant with the use of computer hardware like connecting to the network and installing peripheral devices; (3) knowledgeable of various use of digital videos and photos, how to convert them to different formats (such as GIF, AVI and MPEG) and how to share them; (4) savvy in networking and social media use such as Email, WebEx, Zoom, Google Class, WhatsApp, Facebook, Snapchats, Twitter, MSN, Skype e.t.c.; (5) conversant with ethical issues in information use and sharing; and (6) conversant with computer-related security measures including: antivirus installation, setting and use of passwords, avoiding opening risky files e.t.c. Possession of the above skills will enable the SHIs to constantly be in contact with the student in the recurrent school closures and social restrictions in Nigeria.

Generally, level of one's DL is associated with certain factors, including: gender, education level and type of job. Gender influences the use of digital resources in so many ways. The males have often been reported to be more likely to own smart phones and personal computers (Sjöberg, 2002; Blumenstock & Eagle, 2010), have more access to the internet (Khokhar, 2017; Clement 2021), and more conversant with the use of computer than their female counterparts (Šabić, Baranović & Rogošić, 2022). Education level has also been shown to be proportional with the level of one's digital literacy, implying that the higher or lower the education level, the higher or lower the level of digital literacy respectively (Hargittai & Hinnant, 2008; Van-Deursen & Van-Dijk, 2011; Bulger, Mayer & Metzger, 2014; Ali, Hamza, Maryam & Abdullah, 2015).

Another factor that influences DL level is nature of one's job. Although Ajuwon (2003) and Nwagwu and Oshiname (2009) reported that nurses had poor computer knowledge, in another study, Topkaya and Kaya (2014) argued that nurses had good digital literacy skills but they need to improve on their competency to be effective in their jobs. Low digital literacy has also been reported among adult educators (Mohamady, 2008), counselors (Anagbogu, Nwokolo, Anyamene, Anyachebelu & Umezulike, 2013; Oramah, 2018), dieticians (Ali, Hamza, Maryam & Abdullah, 2015), and health educators (Brar, 2015; O'Doherty, Dromey, Loughed, J. et al., 2018).

The foregoing shows that the level of digital literacy among the SHIs is generally less than desirable and this might be the same with Nigerian SHIs. Not many studies have been conducted to examine the level of DL among the SHIs in Nigeria, and the available ones lack in currency. It is rather unfortunate that in spite of current challenges facing educational institutions in Nigeria, researchers have not paid much needed attention to how ready the SHIs are in continuing to render healthful tips and guidance to the youngsters through digital means amidst these challenges. This is especially so in this era of information explosion when there are abundant misleading pieces of health-related information in the cyber space. This is worrisome and calls for a current examination of how digitally literate the SHIs are in the face of recurring school closures in Nigeria. This will form the basis for possible intervention. Therefore, the present study investigated the level of DL of SHIs in Enugu State, Nigeria.

Research Questions

The following research questions guided this study.

What is the level of DL of the SHIs in Enugu State?

What is the level of DL of the SHIs based on their gender?

What is the level of DL of the SHIs based on their years of work experience?

What is the level of DL of the SHIs based on their level of education?

What is the level of DL of the SHIs based on their nature of job?

Hypotheses

The study hypothesizes a no significant interaction effect of gender, years of work experience, level of education, and nature of job on the mean of digital literacy scores of the SHIs.

Significance of the Study

The study findings exposed the DL gap among the SHIs, and by implication, the extent of ICT capacity building required of the SHIs to be able to meet the day's challenges in education. In this, the government and non-governmental organizations are hoped to be stimulated to increase their commitment in designing a more robust and goal-oriented ICT capacity building programmes not just for the SHIs but also for the students.

Methods

This descriptive study investigated the digital literacy level of School Health Influencers (SHIs) in Enugu State, Nigeria. The study participants consisted of 2431 SHIs in Enugu State made up of Health Educators, Counselors, Adult Educators, Nurses, and Dieticians who participated in the ICT Capacity building for school health workers in Enugu State by Enugu State Technology Hub and Youth Innovation Centre. The participants were from various secondary and tertiary institutions in the state. Convenience sampling techniques was used to draw 2,328 School Health Influencers, consisting of 1223 females and 1,105 males were used for the study.

The study employed Computer Literacy Scale for Newly Enrolled Nursing College Students developed and validated by Lin (2011). However, the questionnaire was slightly modified to suit the contexts of the present study. The modified version, Digital Literacy Questionnaire (DLQ) which had 33 multiple choice questions was validated by 4 Statisticians and 3 ICT experts from University of Nigeria, Nsukka. The DLQ yielded a reliability coefficient of 0.81 using split-half method (Spearman Brown Coefficient).

The DLQ has section A, B, C, D, E, F, and G. Section A had four items (1-4) which elicited information on the personal data including level of education, gender, years of work experience and nature of job of the participants. The respondents were to indicate the options that affect them. Section B, C, D, E, F, and G were meant to find out the level of DL relating to the use of software, hardware, multimedia, networking/social media, ethics in information use/sharing, and computer-related security respectively. The respondents were to indicate their level of literacy by ticking "Extremely Skilled", "Somewhat Skilled", "Poorly Skilled", or "Not Skilled".

Advertisements for free ICT capacity building programme for school health Influencers was thrown open for interested persons with professions related to public health. This programme was sponsored by Enugu State Technology Hub and Youth Innovation Centre. The adverts were done through flyers and posters distributed at markets, schools and other public places in the State. The advert was also shared through various social media platforms and radio broadcasts. This led to mass turnout of would-be participants who were informed of the rationale for the study and need for their involvement. Participants were asked to voluntarily fill out the Digital Literacy Questionnaire prior to the exercise. In the end, 2,328 filled out the questionnaire and were recruited for the study.

The return rate of the instrument was 100%. The IBM Statistical Package for Social Sciences (SPSS) version 23.0 was used for all the statistical analyses. Mean, standard deviation and analysis of covariance were used for data analyses. Responses to the items were weighted as follow: Extremely Skilled (4 points), Somewhat Skilled (3 points), Poorly Skilled (2 points), and Not Skilled

(1 point). The level of DL of the respondents was determined based on the resultant grand mean scores and their position within the spectrum of real limit of numbers. The grand mean scores between 0-0.8 was regarded as very low, 0.9-1.79 was moderate, 2.7-3.59 was high, whereas 3.6-4.0 was taken to be very high. Finally, the null hypotheses were tested using Analysis of Covariance and verified at .05 level of significance and at appropriate degrees of freedom.

Results

Table 1: Demographic Characteristics of Respondents (N= 2328)

<i>Demographic Details</i>	Frequency (f)	Percentages (%)
<i>Gender</i>		
Male	1105	47.5
Female	1223	52.5
<i>Highest Educational Level</i>		
PhD/Masters	206	8.8
Bachelor's Degree/HND	1194	51.3
OND/NCE/JCHEW	928	39.9
<i>Years of Experience</i>		
12 years or less	418	18.0
13-25 years	629	27.0
26 years or more	1281	55.0
<i>Nature of Job</i>		
Health Educator	540	23.2
Counselor	380	16.3
Adult Educator	385	16.5
Dietician	336	14.4
Nurse	687	29.5

Table 1 presents the demographic distributions of the respondents, the School Health Influencers (SHIs) in Enugu State, Nigeria. The table shows that 1105 (47.5%) were male respondents while 1225 (52.5%) were female respondents. In terms of level of education, 206 (8.8%) had PhD/Master's degree, 1195 (51.3%) had bachelor/HND degree while 928(39.3%) had NCE/OND/JCHEW. Based on years of experience, 418(18.0%) had below 13 years of experience, 629(27.0) had between 13-25 years of experience, while 1281(55.0%) had above 25 years of work experience. Regarding nature of job, majority of the respondents were nurses (29.5%), followed by health educators (23.2%). Others were adult educators (16.5%), counselors (16.5%) and dieticians (14.4%).

Table 2: Level of Digital Literacy of SHIs in Enugu State, Nigeria (N= 2328)

S/N	Digital Literacy Constructs	Mean	Std. Deviation	Decision
1	Network and Social Media Use	2.86	.42	High
2	Software Application Use	2.69	.29	Moderate
3	Ethic Information use and Sharing	2.53	.24	Moderate
4	Understanding of computer Related Security	2.41	.38	Moderate
5	Multimedia Utilization	2.26	.39	Moderate
6	Hardware Component Use	1.99	.48	Moderate
	Grand Mean	2.45	.37	Moderate

Limits of number: 0–0.8=Very Low; 0.9 –1.79=Low; 1.8 –2.69=Moderate; 2.7–3.59=High; 3.6 –4.0=Very High

The result presented in table 2 indicates that the level of Digital Literacy (DL) of SHIs in Enugu State, Nigeria was only high in the “Network and Social Media Use” (\bar{x} =2.586) and moderate in the remaining constructs. The respondents were least literate in “Hardware Component Use” (\bar{x} =1.99). In summary, the grand mean of 2.45 shows that SHIs in Enugu State, Nigeria had moderate level of DL.

Table 3: Level of DL of SHIs in Enugu State, Nigeria by Gender (N= 2328).

S/N	Digital Literacy Constructs	Male (N =1105)			Female(N =1223)		
		\bar{x}	SD	Decision	\bar{x}	SD	Decision
1	Software Application Use	2.70	.29	High	2.68	.28	Moderate
2	Hardware Component Use	2.22	.46	Moderate	2.17	.499	Moderate
3	Multimedia Utilization	2.29	.39	Moderate	2.23	.397	Moderate
4	Network and Social Media Use	2.89	.41	High	2.83	.429	High
5	Ethic Information use and Sharing	2.53	.23	Moderate	2.53	.24	Moderate
6	Understanding of computer Related Security	2.44	.38	Moderate	2.38	.38	Moderate
	Grand Mean	2.51		.36	Moderate		2.47 .36
	Moderate						

Limits of number: 0–0.8=Very Low; 0.9 –1.79=Low; 1.8 –2.69=Moderate; 2.7–3.59=High; 3.6 –4.0=Very High

Table 3 presents the descriptive statistics showing the level of DL of SHIs in Enugu State, Nigeria by gender. Generally, the male respondents had higher grand mean in DL scores compared to their female counterparts (2.51 vs 2.47), although the level of DL of both groups is rated moderate. Specifically, the males’ level of DL was ranked high on “Network and Social Media Use” (\bar{x} =2.89)

as well as in “Software Application Use” ($\bar{x}=2.70$), while the females scored high only in “Network and Social Media Use” ($\bar{x}=2.83$). This indicates that male respondents were more digitally literate than do females.

Table 4: Level of DL of SHIs in Enugu State, Nigeria by Work Experience (N= 2328).

S/N	Digital Literacy Constructs	12 years or less (N =418)			13-25 years (N =629)			Above 25years (N =1281)			
		\bar{x}	SD	Decision	\bar{x}	SD	Decision	\bar{x}	SD	Decision	
1	Software Application Use	2.57	.29	Moderate	2.60	.29	Moderate	2.82	.29	High	
2	Hardware Component Use	2.19	.49	Moderate	2.19	.48	Moderate	2.20	.48	Moderate	
3	Multimedia Utilization	2.25	.39	Moderate	2.26	.39	Moderate	2.29	.39	Moderate	
4	Network and Social Media Use	2.77	.43	High	2.79	.42	High	2.86	.43	High	
5	Ethic Information use and Sharing	2.44	.23	Moderate	2.48	.24	Moderate	2.53	.23	Moderate	
6	Understanding of computer Related Security	2.41	.39	Moderate	2.41	.38	Moderate	2.44	.38	Moderate	
	Grand Mean	2.44			Moderate			2.46		Moderate 2.52	

Moderate

Limits of number: 0–0.8=Very Low; 0.9 –1.79=Low; 1.8 –2.69=Moderate; 2.7–3.59=High; 3.6 –4.0=Very High

Table 4 present the descriptive statistics showing the level of DL of SHIs in Enugu State, Nigeria by work experience. The mean scores of DL relating to “Network and Social Media Use” was high across respondents with work experience of 12 years and below ($\bar{x}=2.77$), 13-26 years ($\bar{x}=2.79$), and 26 years and above ($\bar{x}=2.86$). The respondents’ DL score were moderate in the remaining constructs irrespective of years of work experience except in “Software Application Use” where respondents with 26 years and above work experience scored high ($\bar{x}=2.82$). Overall, the latter had the highest grand mean scores ($\bar{x}=2.52$) followed by respondents with 13-25 years of work experience ($\bar{x}=2.46$). Respondents with the least years of work experience had the lowest mean scores in DL ($\bar{x}=2.44$). This indicates that DL increases with years of work experience.

Table 5: Level of DL of SHIs in Enugu State, Nigeria by Level of Education (N= 2328).

S/N	Digital Literacy Constructs	PhD/Masters (N =206)			Bachelor's Degree/HND (N =1194)			OND/NCE/JCHEW (N =928)		
		\bar{x}	SD	Decision	\bar{x}	SD	Decision	\bar{x}	SD	Decision
1	Software Application Use	2.80	.28	High	2.55	.29	Moderate	2.52	.29	Moderate
2	Hardware Component Use	2.19	.48	Moderate	2.19	.48	Moderate	2.21	.49	Moderate
3	Multimedia Utilization	2.25	.39	Moderate	2.25	.39	Moderate	2.27	.39	Moderate
4	Network and Social Media Use	2.85	.40	High	2.45	.43	Moderate	2.40	.42	Moderate
5	Ethic Information use and Sharing	2.55	.24	Moderate	2.53	.23	Moderate	2.49	.24	Moderate
6	Understanding of computer Related Security	2.42	.39	Moderate	2.40	.39	Moderate	1.45	.37	Low
	Grand Mean	2.51		Moderate	2.39		Moderate	2.22		Moderate

Moderate

Decision: 0–0.8=Very Low; 0.9 –1.79=Low; 1.8 –2.69=Moderate; 2.7–3.59=High; 3.6 –4.0=Very High

Table 5 reveals the mean scores of DL of SHIs in Enugu State, Nigeria according to their levels of education. On the whole, the grand mean score of SHIs with PhD/masters showed that they had high level of Digital Literacy (\bar{x} =2.51) compared to those with Bachelor's Degree/HND and OND/NCE/JCHEW who had grand mean of \bar{x} =2.82 and \bar{x} =2.82 respectively. Specifically, PhD/masters respondents had high scores in “Network and Social Media Use” (\bar{x} =2.85) as well as in “Software Application Use” (\bar{x} =2.80) whereas respondents at the lower levels of education had moderate scores in the same constructs. Respondents with lower educational level (OND/NCE/JCHEW) had low performance in “Understanding of Computer Related Security” (\bar{x} =1.45) compared to their counterparts with higher levels of education. This indicates that the higher the level of education, the higher the participants’ DL level.

Table 6: Level of DL of SHIs in Enugu State, Nigeria by Nature of Job (N= 2328).

S/N	Digital Literacy Constructs	Health Educator (N =540)		Counselor (N =380)		Adult Educator (N =385)		Dietician (N =336)		Nurse (N =687)	
		\bar{x} (SD)	Decision	\bar{x} (SD)	Decision	\bar{x} (SD)	Decision	\bar{x} (SD)	Decision	\bar{x} (SD)	Decision
1	Software Application Use	2.82 (.29)	High	2.60 (.29)	Mod	2.58 (.29)	Mod	2.63 (.29)	Mod	2.49 (.29)	Mod
2	Hardware Component Use	2.21 (.48)	Mod	2.00 (.48)	Mod	2.11 (.48)	Mod	2.17 (.48)	Mod	1.97 (.48)	Low
3	Multimedia Utilization	2.27 (.39)	Mod	2.25 (.39)	Mod	2.26 (.40)	Mod	2.26 (.34)	Mod	2.25 (.39)	Mod
4	Network and Social Media Use	2.90 (.41)	High	2.99 (.43)	High	2.86 (.43)	High	2.60 (.43)	Mod	2.51 (.43)	Mod
5	Ethic Information use and Sharing	2.44 (.24)	Mod	1.95 (.24)	Low	2.51 (.23)	Mod	2.44 (.23)	Mod	2.46 (.23)	Mod
6	Understanding of computer Related Security	2.41 (.38)	Mod	2.47 (.39)	Mod	2.52 (.38)	Mod	2.36 (.37)	Mod	1.85 (.38)	Low
Grand mean		2.51	Mod	2.37	Mod	2.47	Mod	2.41	Mod	2.25	Mod

Decision: 0–0.8=Very Low; 0.9 –1.79=Low; 1.8 –2.69=Moderate; 2.7–3.59=High; 3.6 –4.0=Very High; Key: Decn= decision; Mod= moderate

Table 6 reveals the mean scores of DL of SHIs in Enugu State, Nigeria according to nature of their jobs. The table indicated that the grand means of all the respondents were moderate irrespective of job backgrounds. The Health educators had the highest of the grand means (\bar{x} =2.51) whereas the school nurses had the least (\bar{x} =2.25).

Table 7: Summary of Analysis of Covariance on the mean of DL scores of SHIs in Enugu State, Nigeria based on gender, years of work experience, nature of job and education level.

Tests of Between-Subjects Effects						
Dependent Variable: Digital Literacy						
Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	
Corrected Model	247.377a	66	3.748	1.885	.000	
Intercept	68854.710	1	68854.710	34628.937	.000	
Gender	7.561	1	7.561	5.803*	.041*	
Work Experience	98.282	2	98.282	4.567*	.009*	
Job Demand	5.499	4	1.375	.691	.598	
Level of Education	8.469	2	4.369	9.848*	.022*	
Error	4495.676	2261	1.988			
Total	524251.878	2328				
Corrected Total	4743.053	2327				

a. R Squared = .152 (Adjusted R Squared = .124)

Note: * Implies significant at P < 0.05

Table 7 present the result of ANCOVA showing the mean digital literacy scores of SHIs in Enugu State, Nigeria by gender, years of work experience, nature of job and educational level. Findings indicated that digital literacy scores of male and female of SHIs differ significantly ($F = 5.803$; $P < 0.05$). Similarly, in terms of educational level, findings also revealed a significant difference ($F = 4.567$, $P < 0.05$). Equally, in terms of nature of job, findings also revealed significant differences ($F = 9.848$, $P < 0.05$). On the other hand, based on nature of job, findings revealed a non-significant differences ($F = 0.691$, $P > 0.05$).

Discussion

This study found that School Health Influencers (SHIs) in Enugu State, Nigeria had moderate level of Digital Literacy (DL). This finding is expected in that most Nigerian schools are not well equipped with digital resources and the staff members have limited for capacity building on ICT. This may be why moderate level of DL was reported even among the academic staff (Faga & Nwachukwu, 2022). This finding is also in line with previous studies (Konan, 2010; Masood, Khan & Waheed, 2013; Topkaya & Kaya; 2014) which reported moderate computer knowledge and use among people of health-related fields. However, other studies (Anagbogu, Nwokolo, Anyamene, Anyachebelu & Umezulike, 2013; Oramah, 2018) argue that there is often poor digital literacy among SHIs. This will impinge on the level to which the SHIs would be able to interact with the students virtually when schools close.

The study further found that the male respondents had higher grand mean in DL scores compared to their female counterparts (2.51 vs 2.47). The finding was expected and not surprising. This is because the males are always likely to have more technical and scientific skills than the females (Hayes 2001). This seems to be the same with possession of digital skill. For instance, the males have been previously reported to be more competent in general computer uses (Jackson, Ervin, Gardner & Schmitt, 2001; Ramayah & Osman, 2005), more likely to use e-resources (Idowu, Adagunodo, & Idowu 2004; Ramayah & Osman, 2005; Kay, 2006), more likely own smart phones and personal computers (Sjöberg, 2002; Blumenstock & Eagle, 2010), and have more access to the internet (Khokhar, 2017; Clement 2021) than their female counterparts. This might be because the males are more interested in learning computer (Du & Wimme, 2019).

This study also found that: the more the number of years of work experience, the higher the respondents' digital literacy. Specifically, SHIs with 26 years and above work experience had the highest grand mean scores, followed by respondents with 13-25 years of work experience. Digital literacy was lowest among respondents with the least years of work experience (0-12 years). This finding is not surprising since ICT is integral in modern day's work. Therefore, it is expected those who spend more years working are likely to have more knowledge and skills relating to ICT use. However, the available finding shows that teachers with lesser years of experience had higher computer literacy than their average and high-experienced counterparts (Oluwatayo, 2012). The reason for this surprising result might be linked to poor teachers' ICT training and lack of ICT resources characteristic of Nigerian secondary schools as reported in Adomi and Kpangban (2010). Studies that measure the link between years of work experience and DL are very scarce. This is one of the gaps closed by the present study.

This study also found that SHIs with PhD/masters had higher level of Digital Literacy compared to those with Bachelor's Degree/HND and OND/NCE/JCHEW. This finding is expected.

This is because, according to Tarannum and Mondal (2021), education gives an edge and strengthens digital skills. This finding is in line with so many similar previous reports (Van-Deursen & Van-Dijk, 2011; Bulger, Mayer & Metzger, 2014; Ali, Hamza, Maryam & Abdullah, 2015)

This study further found that the grand means of all the SHIs had moderate level of DL irrespective of job backgrounds. There are so many arguments against or in favour of this finding. For instance, both the nursing students (Ajuwon, 2003; Ternus & Shuster, 2008) and practicing nurses (Campbell & McDowell, 2011) have been found to have low digital literacy particularly in respect of basic computer hardware as well as software knowledge including knowledge relating to databases and excel spread sheet. This is why Nwagwu and Oshiname (2009) recommended skill enhancement training for nurses in order to improve their information-seeking problems. In contrary findings, nurses are reported to have good DL (Topkaya and Kaya. 2014). Generally, teachers (Oluwatayo, 2012), health educators (Lavalley-Oxendine, 1988; Kretschmann, 2015), adult educators (Mohamady, 2008), counselors (Anagbogu, Nwokolo, Anyamene, Anyachebelu & Umezulike, 2013; Oramah, 2018), and dieticians (Ali, Hamza, Maryam & Abdullah, 2015) were reported to have low DL.

The analysis of covariance (ANCOVA) showed that there was a significant difference in the mean scores of DL of male and female of SHIs ($F = 5.803$; $P < 0.05$). This finding is not surprising. Majority of the previous studies align to this finding. For instance, in an introductory computer course at the community college level, boys had higher achievement compared to the girls (Spicer-Sutton, Lampley & Good, 2014). In another similar study that assessed the computer literacy of the below poverty line community of Malda District, males reported higher computer literacy compared to females. However, a no significant difference was found in terms of computer using time (Dincer, 2016).

The ANCOVA test further found a significant difference in level of DL of the SHIs based on years of work experience ($F = 4.567$, $P < 0.05$). this finding is not surprising since it is expected that the more one uses a computer, the more one acquires more computer related skills. Today's civil/public service is ICT-driven and those who have longer years of service are more likely to have more exposure to computer use than people with lesser years of work experience. However, this finding was opposed by Oluwatayo (2012) who found that teachers with lesser years of experience had higher computer literacy than their average and high-experienced counterparts. Studies testing the influence of years of work experience on digital literacy is scarce and the present finding is one the contributions of this study in this regard.

Equally, the ANCOVA test revealed a significant difference in the level of DL of the SHIs based on level of education ($F = 9.848$, $P < 0.05$). This result is expected. This is because today's formal education tries to impart necessary level of computer literacy to the learners (Milić & Škorić, 2010) and this strengthens their digital skills (Tarannum & Mondal, 2021). Hence, those with higher levels of education are expected to have more digital skills than their counterparts with lower education. this finding is supported by some previous works (Van-Deursen & Van-Dijk, 2011; Bulger, Mayer & Metzger, 2014; Ali, Hamza, Maryam & Abdullah, 2015).

Finally, the ANCOVA test showed no significant difference in the level of DL of the SHIs based on nature of job ($F = 9.848$, $P < 0.05$). Unfortunately, there was no single study about digital literacy among the SHIs found in the literature with which to compare with this particular finding.

However, previous studies show that among different institutions, there is often poor usage of computer for different purposes across all people of health related jobs (Mulat & Tadesse, 2002; Bediang, Stoll, Geissbuhler, Geissbuhler, Klohn, Stuckelberger, Nko'o & Chastonay, 2013). For instance, a study in a Nigerian University Teaching hospital in 2004 found that only 18.9% of health professionals possessed a good level of digital literacy (Ibrahim, Fatiu & Abubakar, 2004).

Conclusion

This study found that the DL of the SHIs was generally moderate and calls for improvement. In view of current challenges facing today's education leading to repeated school closures, it becomes very crucial for government and managers of school to take the ICT capacity building of the SHIs seriously so that remote mentoring, teaching, counseling and health education of the young ones can continue even when schools close.

Recommendation

We give the following recommendations based on the findings of the research:

1. The managements of educational institutions and policy makers should emphasize on the ICT capacity building of the school health influencers so that they will be able to continue to reach out to the youngsters especially when that physical meetings of the SHIs and the student are constantly being interrupted in Nigeria.
2. Personal computers, Tablets and android phones together with data subscription should be made free of charge or subsidized for the reach of all the SHIs by school authorities.

References

- Adomi, E. E., & Kpangban, E. (2010). *Application of ICTs in Nigerian Secondary Schools. Library Philosophy and Practice (e-journal)*.
<https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1353&context=libphilprac>
- Ajuwon, G. A. (2003). Computer and internet use by first year clinical and nursing students in a Nigerian teaching hospital. *BMC Medical Informatics and Decision Making*, (3)10. Doi:
<https://doi.org/10.1186/1472-6947-3-10>.
- Ali, B., Hamza, A., Maryam, A., & Abdullah, A. (2015). Assessment of professionals' literacy in information and communication technology at the administration of food and nutrition in Kuwait. *Journal of Health & Medical Informatics*, 6(4), DOI:
<http://dx.doi.org/10.4172/2157-7420.1000198>.
- Anagbogu, M. A., Nwokolo, C. N., Anyamene, A. N., Anyachebelu, F. E. & Umezulike, R. Q. (2013). Professional challenges to counselling practice in primary schools in Anambra State, Nigeria: The way forward *International Journal of Psychology and Counselling*, 5(5), 97-103
- Bediang, G., Stoll, B., Geissbuhler, A., Geissbuhler, A., Klohn, A. M., Stuckelberger, A., Nko'o, S., & Chastonay, P. (2013). Computer literacy and E-learning perception in Cameroon: The

- case of Yaounde Faculty of Medicine and Biomedical Sciences. *BMC Med Educ* 13(57).
<https://doi.org/10.1186/1472-6920-13-57>
- Beverly Hills Therapy Group (2021). *School Counselors Play an Important Role in Our Schools*.
<https://bhtherapygroup.com/school-counselors-play-an-important-role-in-our-schools/>
- Blumenstock, J., & Eagle, N. (2010). Mobile divides: Gender, socioeconomic status, and mobile phone use in Rwanda. *Proceedings of the 4th ACM/IEEE International Conference on Information and Communication Technologies and Development, London, 13–15 December*, Article 6. New York: ACM.
- Brar, I. S. (2015). Digital information literacy among health sciences professionals: A case study of GGS Medical College, Faridkot, Punjab, India. *Proceedings of Informing Science & IT Education Conference*, 531-541.
- Bright Edge (2022). *What is an influencer?* <https://www.brightedge.com/glossary/influencer-marketing>
- Bulger, M. E., Mayer, R. E. & Metzger, M. J. (2014). Knowledge and processes that predict proficiency in digital literacy. *Reading and Writing*, 27, 1567–1583.
<https://doi.org/10.1007/s11145-014-9507-2>
- Campbell, C. J., & McDowell, D. E. (2011). Computer literacy of nurses in a community hospital: Where are we today? *The journal of Continuing Education in Nursing*, 42(8), 365-370.
- Center for Disease Control (2022). *Promoting Health for Children and Adolescents*.
<https://www.cdc.gov/chronicdisease/resources/publications/factsheets/children-health.htm>
- Centre for Disease Control and Prevention (2021a). *Nutrition education in US schools*.
https://www.cdc.gov/healthyschools/nutrition/school_nutrition_education.htm
- Centre for Disease Control and Prevention (2021b). *Health Education in Schools*.
<https://www.cdc.gov/healthyyouth/health-education/index.htm>
- Christoph, G., Goldhammer, F., Zylka, J., & Hartig, J. (2015). Adolescents' computer performance: The role of self-concept and motivational aspects. *Computers & Education*, 81, 1-12.
- Clement, J. (2021). *Global internet usage rate 2019, by gender and region*. <https://www.statista.com/statistics/491387/gender-distribution-of-internet-usersregion/#:~:text=There%20are%20still%20vast%20disparities,online%20access%20was%2077%20percent.>
- Dessy, S., Gninafon, H., Tiberti, L., & Tiberti, M. (2021). *COVID-19 lockdowns reduce children's probability to return to school: Evidence from Nigeria*.
<https://blogs.worldbank.org/developmenttalk/covid-19-lockdowns-reduce-childrens-probability-return-school-evidence-nigeria>
- Dhami, M. (2020). *The importance of guidance and counselling in adolescents' life*.
<https://timesofindia.indiatimes.com/readersblog/manisha-dhami/the-importance-of-guidance-and-counselling-in-adolescents-life-28624/>

- Dincer, S. (2016). Assessing the Computer Literacy of University Graduates. Presented in the *Third International Conference on Open and Flexible Education (ICOFE 2016)*.
https://www.researchgate.net/profile/Serkan-Dincer/publication/308349331_Assessing_the_computer_literacy_of_university_graduates/inks/57e193ff08ae1f0b4d93ec49/Assessing-the-computer-literacy-of-university-graduates.pdf?origin=publication_detail.
- Eze, J. (2018). *Lassa Fever: Schools shut, patients evacuated from Ebonyi hospital*.
<https://www.premiumtimesng.com/news/headlines/255925-lassa-fever-schools-shut-patients-evacuated-ebonyi-hospital.html>.
- Faga, A., & Nwachukwu, V. N. (2022). *Assessment of computer literacy skills among academic staff of University of Jos*. https://www.researchgate.net/publication/358307165_assessment_of_computer_literacy_skills_among_academic_staff_of_university_of_jos
- Fairbairn, C. E., & Sayette, M. A. (2014). A Social-Attributional Analysis of Alcohol Response. *Psychol Bull.* 140(5): 1361–1382. doi: 10.1037/a0037563
- Hargittai, E., & Hinnant, A. (2008). Differences in Young Adults' Use of the Internet. *Communication Research*, 35(5), 602-621. doi: [10.1177/0093650208321782](https://doi.org/10.1177/0093650208321782)
- Ibrahim, S., Fatiu, A., & Abubakar, A. (2004). Knowledge and utilization of information technology among health care professionals and students. *Journal of Medical Internet Research*, 6, e45-10.2196/jmir.6.4.e45.
- Jahan, F. A., Zviedrite, N., Gao, H., Ahmed, F., & Uzicanin, A. (2021). *Causes, characteristics, and patterns of prolonged unplanned school closures prior to the COVID-19 pandemic – United States, 2011 – 2019*.
<https://www.medrxiv.org/content/10.1101/2021.11.02.21265805v2.full-text#ref-2>
- Khokhar, T. (2017). *Chart: In These Countries, Internet Use is Higher Among Women than Men*.
<https://blogs.worldbank.org/opendata/chart-these-countries-internet-use-higher-among-women-men>.
- Kirk, S. F. L., Cade, J. E., & Greenhalgh, A. (2002). Dietitians and the internet: Are dietitians embracing the new technology? *Journal of Human Nutrition and Dietetics*, 14(6), 477-484.
<https://doi.org/10.1046/j.1365-277X.2001.00314.x>
- Konan, N. (2010). Computer literacy levels of teachers. *Procedia Social and Behavioral Sciences*, 2, 2567–2571
- Kretschmann, R. (2015). Effect of physical education teachers' computer literacy on technology use in Physical Education. *The Physical Educator*, 72(5). DOI: <https://doi.org/10.18666/TPE-2015-V72-I5-4641>
- Lin, T. (2011). Computer literacy scale for newly enrolled nursing college students: Development and validation. *Journal of Nursing Research*, 19(4), 305-317.

- Lopes, H. (2018). *How adult education can save your life*. <https://www.dvv-international.de/en/adult-education-and-development/editions/section-1-playing-a-role/section-1-playing-a-role/how-adult-education-can-save-your-life>.
- Masood, S., Khan, R. A., & Waheed, G. (2013). *Computer literacy among the medical staff at Avicenna Medical college and Hospital*. http://pjmhsonline.com/computer_literacy_among_the_medi.htm
- Mazyck, D., Cellucci, M., & Largent, P. (2015). The Power of influence: School nurse stories. *NASN School Nurse*, 30(4), 232-4. doi: 10.1177/1942602X15588504. Epub 2015 May 27. PMID: 26018906.
- Melita Milić, M., & Škorić, I. (2010). The Impact of Formal Education on Computer Literacy. *International Journal of Emerging Technologies in Learning*, 5(SI2):60-63
DOI:[10.3991/ijet.v5s2.1253](https://doi.org/10.3991/ijet.v5s2.1253)
- Mohamady, E. S. (2008). *A suggested computer literacy program for learners in literacy and adult education classes*
https://www.researchgate.net/publication/275652210_A_suggested_Computer_Literacy_Program_for_Learners_in_Literacy_and_Adult_Education_Classes
- Mulat, D., & Tadesse, B. (2002). *A report on ICT penetration and usage in Ethiopia*. Addis Ababa, Ethiopia: Addis Ababa University
- National Academy of Sciences (2020). *Schools should prioritize reopening in fall 2020, especially for Grades K-5, While weighing risks and benefits*.
<https://www.nationalacademies.org/news/2020/07/schools-should-prioritize-reopening-in-fall-2020-especially-for-grades-k-5-while-weighing-risks-and-benefits>].
- National Association of School Nurses (2015). The use of restraints or seclusion in the school setting. *NASN School Nurse*, 30(2), 128-9. doi: 10.1177/1942602X14560340. PMID: 25816445.
- Nwagwu, W. E., & Oshiname, R. (2009). Information Needs and Seeking Behaviour of Nurses at the University College Hospital, Ibadan, Nigeria. *African Journal of Library, Archives & Information Science*, 19(1), 25-38.
- O'Doherty, D., Dromey, M., Lougheed, J. *et al.* (2018). Barriers and solutions to online learning in medical education – an integrative review. *BMC Medical Education*, 18, 130 .
<https://doi.org/10.1186/s12909-018-1240-0>.
- Ogeniyi, M. (2022). *Looking back on Nigeria's COVID-19 school closures: Effects of parental investments on learning outcomes and avoidance of hysteresis in education*.
<https://riseprogramme.org/publications/looking-back-nigerias-covid-19-school-closures-effects-parental-investments-learning>.

- Okangla, S. P., (2022). *ASUU strike: The continuous closure of public universities a recipe for disaster*. https://thenigerialawyer.com/asuu-strike-the-continuous-closure-of-public-universities-a-recipe-for-disaster/#_ftn1
- Okoh (2018). Challenges on Utilizing Information and Communication Technology (ICT) In Counselling and its Implication for Capacity Building. *ATBU Journal of Science, Technology and Education*, 6(2).
<http://www.atbuftejoste.com/index.php/joste/article/view/548>
- Okopi, F. O. (2010). Challenges of technology mediated approach to counselling in the National Open University of Nigeria. *African Journal of Political Science and International Relations*, 4(4), 115-119,
- Oluwatayo, J. A. (2012). Assessment of computer literacy of secondary school teachers in Ekiti State, Nigeria. *Journal of International Education Research (JIER)*, 8(2), 97–104.
<https://doi.org/10.19030/jier.v8i2.6829>.
- Oramah, E. U. (2018). *Online or web-counselling in Nigeria: current status, relevance, problems and implications*. <https://hdl.handle.net/10520/EJC-db427742e>
- Šabić, J., Baranović, B., & Rogošić, S. (2021). Teachers' Self-efficacy for Using Information and Communication Technology: The Interaction Effect of Gender and Age. *Informatics in Education*, 21(2), 353–373.
- Spicer-Sutton, J., Lampley, J., & Good, D. W. (2014). Self-assessment and student improvement in an introductory computer course at the community college level. *Journal of Learning in Higher Education*, 10(1), 59-65.
- Sprout Social (2022). *Influencer*. <https://sproutsocial.com/glossary/influencer/>
- Tarannum, N., & Mondal, P. (2021). *Assessing the computer literacy among the below poverty line (BPL) community of Malda District*
<https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=11113&context=libphilprac>
- Ternus, M. P., & Shuster, G. F. (2008). Computer literacy in a traditional nursing programme: A 7 year study to identify computer based skills needed for success. *MERLOT Journal of Online Learning and Teaching*, 4(1), 1-13.
- Topkaya, S. G., & Kaya, N. (2014). Nurses' computer literacy and attitudes towards the use of computers in health care. *International Journal of Nursing Practice*, 21(S2), 141-149
- Ugwu, N. F. (2021). E-Option for Health Education Amidst COVID-19: An Examination of Somalia Contexts. *International Studies in Educational Administration (Commonwealth Council for Educational Administration & Management (CCEAM))*, 49(1), 86-93.
- Ugwu, N. F., Onyekwere, O. K., Anibueze, A. U., & Familoni, J. K. (2021). Strengthening Sexuality Education in Contemporary Tertiary Institutions: Gains and Hindrances. A book chapter presented in the book of reading: *Contemporary Tertiary Education in Africa: Challenges and Opportunities for Sustainable Educational Development*.

- Ugwu, N. F., Onyekwere, O. K., Anibueze, A. U., & FAMILONI, J. K. (2021). Strengthening Sexuality Education in Contemporary Tertiary Institutions: Gains and Hindrances. A book chapter presented in the book of reading: *Contemporary Tertiary Education in Africa: Challenges and Opportunities for Sustainable Educational Development*.
- United Nations Children Fund (UNICEF, 2022). *UNICEF calls for safety of learners in schools to encourage girls' education*. <https://www.unicef.org/nigeria/press-releases/unicef-calls-safety-learners-schools-encourage-girls-education>
- United Nations Education and Science and Cultural Organization (UNESCO, n.d.). *Adverse consequences of school closures* <https://en.unesco.org/covid19/educationresponse/consequences>
- University of Chester (2021). *Digital literacy and computer literacy – aren't they the same thing?* <https://www1.chester.ac.uk/news/digital-literacy-and-computer-literacy-aren%E2%80%99t-they-same-thing>
- Van-Deursen, A., Van-Dijk, J. (2011). Internet skills and the digital divide. *New Media & Society*, 13(6), 893-911. doi:[10.1177/1461444810386774](https://doi.org/10.1177/1461444810386774)
- Wahab, A. (2022). *Students protest continued closure of universities*. <https://www.vanguardngr.com/2022/05/students-protest-continued-closure-of-universities/>
- WahId, R., Farooq, O. & Aziz, A. (2021). The New Normal: Online Classes and Assessments during the COVID-19 Outbreak. *Journal of e-Learning and Knowledge Society*, 17 (2), 85-96. DOI: <https://doi.org/10.20368/1971-8829/1135346>
- Western Sydney University (2020). *What is digital literacy*. https://www.westernsydney.edu.au/studysmart/home/study_skills_guides/digital_literacy/what_is_digital_literacy
- World Health Organization (2021). *Adolescent and young adult health*. <https://www.who.int/news-room/fact-sheets/detail/adolescents-health-risks-and-solutions>
- World Health Organization (2022). *Adolescent health*. https://www.who.int/health-topics/adolescent-health#tab=tab_1