Manageria: Jurnal Manajemen Pendidikan Islam
2023 Volume 8, Nomor 1, 21-38 | DOI: https://doi.org/10.14421/manageria.2023.81-02

Evaluating Digital Technology Access and Usage among Teachers

Godfred Sarpong[1]*, Michael Osei Tutu Bonsu[2], Achiaa Adu-Poku[3]
[1]University of Education, Winneba, Ghana
[2]Korea National University of Education, South Korea
[3]Kwame Nkrumah University of Science and Technology, Ghana
**corresponding author*: sirsarpong1990@gmail.com

ABSTRACT*:*
This study investigates teachers' access to digital technologies in Public Basic Schools in Asante Akim Central Municipality, Ghana. The study uses a quantitative approach to evaluate the availability and types of Information and Communication Technology (ICT) tools, teachers' motivational and physical comfort with digital technologies, and their skills and usage patterns. Engaging with 108 teachers highlights gaps in access to and use of ICT tools. The results demonstrate that while teachers have access to digital tools such as laptops and smartphones, their access to specific software and digital tools is limited. In terms of motivation, teachers are primarily intrinsically motivated to use digital technologies. Teachers exhibited comfort and confidence in utilizing ICT tools, indicating operational skills and access to ICT. The findings underline the need to address these educational implementation gaps and reduce the digital divide. This research contributes to the literature on digital technology access in developing countries and provides valuable insights for stakeholders involved in integrating educational technology.

ARTICLE HISTORY:
Received: 11 March 2023
Accepted: 30 April 2023
Published: 30 May 2023

KEYWORDS*:*
Digital Technology Access, Basic Education in Ghana, Teachers' ICT Utilization,

P-ISSN : 2502-9223; E-ISSN : 2503-4383

ABSTRAK

Penelitian ini menyelidiki tentang akses guru terhadap teknologi digital di Sekolah Dasar Umum di Kota Asante Akim Central, Ghana. Penelitian ini menggunakan pendekatan kuantitatif untuk mengevaluasi ketersediaan dan jenis alat Teknologi Informasi dan Komunikasi (TIK), motivasi dan kenyamanan fisik guru dalam menggunakan teknologi digital, serta keterampilan dan pola penggunaan mereka. Melibatkan 108 guru, penelitian ini menyoroti kesenjangan dalam akses dan penggunaan alat TIK. Hasil penelitian menunjukkan bahwa meskipun guru memiliki akses ke alat-alat digital seperti laptop dan smartphone, akses mereka terhadap perangkat lunak dan alat digital tertentu terbatas. Dalam hal motivasi, guru-guru lebih cenderung memiliki motivasi intrinsik dalam menggunakan teknologi digital. Guru-guru menunjukkan kenyamanan dan kepercayaan dalam memanfaatkan alat TIK, yang menunjukkan keterampilan operasional dan akses ke TIK. Temuan ini menekankan perlunya mengatasi kesenjangan implementasi pendidikan ini dan mengurangi kesenjangan digital. Penelitian ini memberikan kontribusi pada literatur tentang akses teknologi digital di negara-negara berkembang dan memberikan wawasan berharga bagi para pemangku kepentingan yang terlibat dalam integrasi teknologi pendidikan.

Kata kunci: Akses Teknologi Digital, Pemanfaatan TIK, Pendidikan Dasar di Ghana.

INTRODUCTION

The landscape of global sectors has experienced a significant transformation through the integration of Information and Communication Technology (ICT), with education standing as a primary example of this trend (Chaeruman, 2005; Yusuf & Onasanya, 2004). This integration of ICT in education has triggered profound changes in teaching methodologies, learning processes, and research practices, thereby reshaping societal structures and the trajectory of development. Consequently, the significance of ICT access in education extends beyond academia, influencing broader societal patterns and thus establishing itself as an issue of global concern (Fitriyadi, 2013; Ghavifekr & Rosdy, 2015). The transformative impact of ICT in education has not only revolutionized traditional educational approaches but has also brought about a paradigm shift in how societies perceive and prioritize access to technology for learning purposes. Thus, the integration of ICT in education has become a

driving force for global development and a critical factor in addressing inequalities in education worldwide (Gamage et al., 2023).

Among the central figures in this integration process are teachers responsible for ensuring the effective use of ICT in their teaching (Gasaymeh et al., 2017). They are expected to employ suitable teaching methods that respect and address the unique characteristics of specific communities. As technology becomes integral to everyday life, equipping teachers with essential technology skills and knowledge has shifted from a luxury to a necessity. Educators must acquire the necessary competencies to leverage technology effectively within their instructional practices. By embracing these technological advancements, teachers can enhance their teaching effectiveness and facilitate meaningful learning experiences for their students (Chang et al., 2016a).

Existing literature has emphasized the influential role of ICT in supporting student academic development (Ben Youssef et al., 2022; Garrison & Kanuka, 2004). Notably, the success of a student's academic journey largely depends on the teachers' competence and ability to adapt to the rapidly changing technological environment. In this regard, academic development can be enhanced when teachers efficiently integrate ICT tools into the teaching and learning process. Moreover, studies have shown that integrating ICT into education enhances students' critical thinking skills, problem-solving abilities, and information literacy, which are crucial for academic success (Falloon, 2020a). By incorporating ICT tools such as interactive multimedia, online learning platforms, and virtual simulations, teachers can create a more engaging and interactive learning environment that caters to the diverse learning needs of students. Consequently, students are better equipped to navigate the digital age and acquire the necessary skills for lifelong learning and success in the 21st century (Alobaid, 2020). The effective integration of ICT in education can revolutionize students' academic development, empowering them with the knowledge and skills needed to thrive in a technologically advanced society. Another study emphasizes the necessity for teachers to be proficient in using emerging technologies that students are already familiar with (Dogan et al., 2021; Prensky, 2001). According to him, the teaching process can be significantly improved if teachers use technologies constructively to engage students. Hence, the ability to exploit these tools effectively can lead to increased retention rates and overall teaching effectiveness.

Previous research has consistently shown the positive impacts of teachers' access to and use digital technologies (Gasaymeh et al., 2017). These impacts are multifaceted, benefiting students by enhancing their learning experience, teachers by improving their teaching efficiency, and schools and countries by promoting educational quality and national development. Moreover, integrating digital technologies into education has fostered students' critical thinking, creativity, and problem-solving skills. Additionally, the availability of digital resources expands the range of educational materials and enables personalized learning, catering to individual student'sstudents'd learning styles. Furthermore, using digital technologies in classrooms facilitates student collaboration and communication, fostering a collaborative and interactive learning environment. Overall, the findings highlight the importance of teachers' access to and practical usage of digital technologies in promoting holistic educational development and national progress (Falloon, 2020a).

Despite the unanimous agreement on the importance of teachers' access to ICT, there remains a significant gap in understanding the range of digital technologies available to teachers and the factors influencing their access and subsequent use (Falloon, 2020b; Player-Koro, 2012). This knowledge gap becomes more pronounced in developing countries such as Ghana, where comprehensive research on teachers' access to and utilization of ICT is scarce. To address this gap, a systematic investigation is necessary to explore teachers' access to ICT in Ghana and identify the factors that hinder or facilitate their use. Such research would provide valuable insights into teachers' challenges in integrating digital technologies into their pedagogical practices. It would also inform the development of effective strategies and policies to promote equitable access to ICT tools and resources. Furthermore, understanding the contextual factors that shape teachers' access and utilization of ICT in developing countries like Ghana is crucial for designing targeted interventions that can empower educators and enhance educational outcomes in these settings.

This study aims to bridge this gap by evaluating the access to digital technologies among teachers at Public Basic Schools in Asante Akim Central Municipality, Ghana. Specifically, the study will explore the types of ICT tools teachers access, their motivational and physical familiarity with digital technologies, and their skills and usage patterns. This research is significant for its potential to improve the understanding of teachers' access to digital

technologies and its potential to inform strategies to enhance ICT implementation in education. Furthermore, the findings of this study will contribute to the existing literature on digital technology access in developing countries, particularly in the context of primary public schools. The research will employ a mixed-methods approach, combining surveys and interviews to gather comprehensive data. The results will provide valuable insights for policymakers, educators, and stakeholders involved in educational technology integration, ultimately aiming to narrow the digital divide and create more inclusive learning environments. This study aims to pave the way for more effective and equitable digital education initiatives in Asante Akim Central Municipality and beyond by addressing the gaps in the access and utilization of ICT tools.

METHODS

This research adopted a quantitative approach, specifically using a descriptive survey design. The main goal was to assess teachers' access to technology within 26 Public Basic Schools in the Asante Akim Central Municipality of Ghana. The selection of these schools was based on their geographical proximity and the accessibility of the teaching staff within these institutions. From the selected schools, an accessible population of 154 teachers was identified. The sample size, determined using the (Krejcie & Morgan, 1970) table, was 108 participants, accounting for approximately 70% of the accessible population. Given the population's homogeneity and the need for swift data collection, the research employed a convenience sampling technique (Acharya et al., 2013). The data was gathered using a 57-item questionnaire, which was converted into a Google form and distributed via various social media platforms, with WhatsApp being the primary distribution mode. The questionnaire, structured using a 5-point Likert scale, solicited information regarding demographics, teachers' technical skills, motivational skills, and ICT usage and access. The researchers achieved a 100% response rate for the administered questionnaires. The data was transcribed and analyzed using SPSS V 23 and Excel Spreadsheet. The research findings were presented descriptively, with data in tables for more transparent comprehension.

FINDINGS AND DISCUSSION

FINDINGS

This research examines teachers' access to digital technologies in Public Basic Schools in Asante Akim Central Municipality, Ghana, to enhance the implementation of Information and Communication Technology (ICT) in education and potentially reduce the digital divide. The focus is on teachers' availability and types of ICT tools, their motivation and comfort with these digital technologies, and their skill sets and usage habits. The data presented in the following tables illuminate the digital technology landscape within the surveyed schools and teachers' attitudes towards, experience with, and use of these technologies.

Table 1: Age of Teachers

	Total	
Age Group	N	%
20 – 30	50	46.29
31 – 41	40	37.04
41 -50	11	10.19
51-60	7	6.48
60+	0	0.00
Total	**108**	**100**

Source: Fieldwork (2021)

Table 1 points out that 46.29% of the respondents are between 20 and 30, 37.04% are between 31 and 40 years, 10.19% are between 41 and 50, and 6.48% are between 51 and 60. It can be shown that many of the respondents are between 30 and 60 years old, and none are beyond 60 years.

Table 2: Teachers' Teaching Experience

		Total
Duration	N	%
0 – 5 years	47	43.52
6 – 10 years	22	20.37
11 – 15 years	19	17.59
16 – 20 years	7	6.48
21 – 25 years	9	8.33
25+ years	4	3.70
Total	**108**	**100**

Source: Fieldwork (2021)

Table 2 indicates that 43.52% of the respondents had taught between 0 – 5 years, 20.37% had taught between 6 – 10 years, and 17.59% had taught between 11 – 15 years. The table further reveals that 6.48% of the respondents had 16 – 20 years of experience in teaching, and for those with 21 – 25 years of teaching experience, 8.33% and 3.70% had over 25 years of teaching experience.

Table 3: Teachers' teaching position

Teaching Position	N	%
Headteacher	17	15.74
Classroom Teacher	42	38.89
Subject Teacher	48	44.44
Total	**108**	**100**

Source: Fieldwork (2021)

Table 3 shows that 15.74% were Headteachers, 38.89% were classroom Teachers, and 44.44% were Subject Teachers.

Table 4: Teachers' Level of Teaching

Teaching Position	N	%
KG	13	12.04
Lower Primary	16	14.85
Upper Primary	29	26.85
JHS	49	45.37
Total	**108**	**100**

Source: Fieldwork (2021)

Table 4 shows that 12.74% were KG teachers, 14.85% were Classroom Teachers, and 44.44% were Subject Teachers.

Table 5: Teachers' Access to ICT Tools at School and Home

	Yes		No			
Laptop computer	**N**	**%**	**N**	**%**	**Total (%)**	**N**
	62	57.41	46	42.59	108(100)	
Smartphone/Tablet/Ipad	101	93.52	7	6.48	108(100)	
USB Flash drive (memory stick)	69	63.89	39	36.11	108(100)	
Office Software Suite	67	62.04	41	37.96	108(100)	
Broadband/DSL internet	36	33.33	72	66.67	108(100)	
Learning Management System	43	33.33	65	60.19	108(100)	
Printer	22	39.81	86	79.63	108(100)	
Statistical Software	11	10.11	97	80.81	108(100)	
Desktop computer	32	29.63	76	70.37	108(100)	
Photo editing software	31	28.70	77	77.30	108(100)	
Video editing software	24	22.22	84	77.78	108(100)	

Source: Fieldwork (2021)

Teachers' access to ICT tools at school and home

Table 5 shows that, out of the 108 teachers, 57.4% had access to laptop computers, 93.5% had access to cell phones with internet functionality, 63.89% had access to USB Flash drive, 62% had access to office suite software, 3.3% had access to Broadband/DSL internet, 39.8% had access to the Learning Management System, 20.4% had access to printers, 10.2% had access to Statistical software, 29.6% had access to Desktop computers. On photo editing and video editing software, 28.7% and 22.2% had access, respectively.

The study revealed that the intelligent cell phone is the ICT tool teachers have the most access to, with statistical software having the least access. This could result from teachers needing exposure to research at the pre-tertiary level. This study, however, contrasts with a study conducted by (Ofori, 2019), indicating that most educators had access to statistical software. Also, a significant number of them had access to laptops, which means that they may not need a desktop, which could be the reason for their less access.

Overall, teachers' access to all the ICT tools studied has been consistent with an earlier study (Akinde & Adetimirin, 2017; Atuahene, 2019; Ofosu-Appiah, 2017; Paul & Chandak, 2019).

Table 6: Teachers' Motivational Access to Digital Technologies

	SA N (%)	A N(%)	D N(%)	SD N(%)	Mean	SD
1. Using computers and the Internet can improve my work performance.	63 (58.3)	37 (34.3)	7 (6.5)	1 (.9)	1.5	.66
2. The internet can provide me with information leading to better decisions.	58 (53.7)	42 (38.9)	7 6.5	1 .9	1.5	.66
3. Using a computer and the The Internet is enjoyable.	50 (46.3)	51 (47.2)	6 (5.6)	1 (.9)	1.6	.64
4. Seeing other teachers using computers and the Internet inspires me.	47 (43.5)	50 (46.3)	9 (8.3)	2 (1.9)	1.7	.70
5. I am interested in adopting digital technologies because my district provides enough technology support	19 (17.6)	28 (25.9)	37 (34.3)	17 (8.3)	2.5	.98
6. I want to use ICT because my superiors expect me to use it.	17 (15.7)	35 (32.4)	43 (39.8)	13 (12.0)	2.5	.91
7. I wish to use computers and the Internet because my students think I should use them.	17 (15.7)	34 (31.5)	40 (37.0)	17 (15.7)	2.5	.93

	SA N (%)	A N(%)	D N(%)	SD N(%)	Mean	SD
8. Using ICT will be of no benefit to me.	6 (5.6)	19 (17.6)	31 (28.7)	51 (47.2)	3.2	.92

SD= Standard Deviation

Source: Fieldwork (2021)

Teachers' Motivational Access to Digital Technologies

On teachers' motivational access to digital technologies, they were rated on a scale of four, 1= strongly agree, 2= agree, 3=disagree, and four strongly disagree. From Table 8, the majority (58.3%) of the teachers strongly agree that using computers and the Internet can improve their work performance, (53.7%) of respondents strongly agreed that using the Internet can give them information to make better choices, (47.2%) agree that computer and internet usage is perceived to be enjoyable, 46.3% agree that seeing other teachers use the computer and the internet inspires them to use it as well.

On the hand, 34.3%, which constitutes the majority of teachers, disagree with the fact that they are interested in adopting digital technologies due to the technical support provided by the district, 38.3% disagree that their usage of ICT is not dependent on the expectations of their superiors, 37% further disagree with the fact that students do not contribute to the usage of computer and internet by teachers, 47.2% strongly disagree that using ICT will be of no benefit to them.

Their responses show that most teachers sampled are intrinsically motivated to use ICT tools. This confirms a study conducted by (Akinde & Adetimirin, 2017; Chang et al., 2016b; Sampath et al., 2022) that teachers have motivational access to ICT tools.

Table 7: Teachers' Operational Skills Access to Digital Technologies

	SA	A	D	SD		
	F (%)	F (%)	F (%)	F (%)	Mean	SD
1. creating and editing a text file in a word processing program makes me comfortable.	36 (33.3)	50 (46.3)	19 (17.6)	3 (2.8)	1.64	0.81
2. It is easy for me to create a computer presentation.	24 (22.2)	52 (48.1)	29 (26.9)	3 2.8	1.81	0.90
3. I feel difficulty in changing some basic computer settings	14 (13.0)	29 (26.9)	44 (40.7)	21 (19.4)	2.90	0.96
4. I can save images and text from the website on a hard disk.	32 (29.6)	51 (47.2)	23 (21.3)	2 (1.9)	1.94	0.97
5. I feel confident downloading programs from the internet.	41 (38.0)	57 (52.8)	7 (6.5)	3 (2.8)	1.71	0.85
6. I can send an attachment with an email.	37 (34.4)	52 (48.1)	14 (13.0)	5 (4.6)	1.58	0.78
7. I know enough about transferring files from a hard disk to a USB flash drive and vice versa.	37 (34.3)	44 (40.7)	21 (19.4)	4 (3.7)	1.65	0.82

SD= Standard Deviation OSA= Operational Skills Access, SD(OSA) = 0.68, Mean (OSA)=1.66
Source: Fieldwork (2021)

Teachers' Operational Skills Access to Digital Technologies

To assess teachers' operational skills and access to digital technologies, they were rated on a scale of four, 4= strongly disagree, 3= disagree, two agree, and 1= strongly agree. From their responses, 46.3% agree that they feel comfortable in creating and editing a text file in a word processing program, 48.1% respondents agree that it is easy to create a computer presentation software, 40.7% disagree that they feel difficult to change some basic computer settings (wallpaper, time/date, sounds, etc.), 47.2% agreed that they can save images and text from a website onto their computers, 52.8% agree that they feel confident to download from the internet, 48.1% agree that they can send an attachment with emails and finally, 40.7% agree that they know enough about transferring files from hard disk to a USB flash drive and vice versa respondents. It can be deduced from their responses that teachers have operational skills and access to ICT.

Table 8: Teachers' Instructional Usage Access to Digital Technologies

	Usage Access					
	VO	O	S	N		
	N(%)	N(%)	N(%)	N(%)	Mean	SD
1. I use ICT for communication about assignments among students.	30 (16.7)	33 (27.8)	25 (30.6)	2 (23.1)	1.65	0.56
2. I use ICT to enhance students' content learning.	45 (14.8)	29 (41.7)	10 (26.9)	4 (5.06)	1.46	0.83
3. I use ICT for facilitating students' group work.	14 (13.0)	29 (26.9)	36 (33.3)	27 (25.0)	1.67	0.92
4. I use ICT to improve students' problem-solving skills.	16 (14.8)	39 (36.1)	30 (27.8)	22 (20.4)	1.90	0.84
5. I use digital technologies for the delivery of my instruction.	10 (9.3)	40 (37.0)	31 (28.7)	26 (24.1)	1.72	0.96
6. I use digital technologies to communicate with students.	10 (9.3)	32 (29.6)	36 (33.3)	30 (27.8)	1.46	0.77
7. I prepare learning materials using computer and internet resources.	18 (16.7)	45 (41.7)	31 (28.7)	14 (13.0)	1.67	0.92
8. I develop critical thinking skills among students with the help of ICT.	18 (16.7)	42 (38.9)	30 (27.8)	18 (16.7)	1.46	0.83
9. I use ICT to encourage peer feedback among my students.	15 (13.9)	31 (28.7)	37 (34.3)	25 (23.1)	1.42	0.92

SD= Standard Deviation IUA= Instructional Usage Access. SD (IUA) = 0.86, Mean (IUA) =1.83
Source: Field Data (2021)

Teachers' skills and usage of access to digital technologies

Regarding the use of ICT in teaching and learning, teachers were rated on a scale of four. 4=very often, 3=often, 2=seldom, 1=never. From their responses, 30.6% seldom use ICT to communicate to students about their assignments, 41.7% often use ICT to enhance students' learning, 33.3% seldom use ICT to facilitate students' group work, 36.1% often use ICT to help enhance the student's problem-solving skills, 37% and often use ICT tools in instructional delivery, 33.3% seldom use ICT tools to communicate with students, 41,7% often prepare teaching/Learning materials with ICT tools, 38.9% often develop critical thinking skills among students with the help of ICT. Lastly, 34.3% representing the majority, seldom use digital tools to enhance student-to-student interaction. Overall, teachers often use digital technologies in their instructional process, considering the mean of 1.41 and the standard deviation of =.81.

From the findings, it could be emphasized that generally, teachers have skills in operating the computer and using some essential software, searching for information over the internet, and using it to make decisions. It was also discovered that teachers use digital tools for enrichment and teaching careers. This resonates with the study that most teachers have skills and use ICT tools for various purposes (Chang et al., 2016a; Osman, 2017; Shirazi et al., 2019; Soomro et al., 2018).

DISCUSSION

The growing influence of digital technologies in education and their potential to bridge the digital divide has been a topic of considerable scholarly discussion (Vassilakopoulou & Hustad, 2023). The results of this study, focusing on primary public schools in Asante Akim Central Municipality, Ghana, demonstrate a nuanced landscape of ICT access among teachers. This evaluation considers diverse variables, such as the availability and types of ICT tools, teachers' comfort levels and motivations towards these technologies, and their specific skill sets and usage habits. Furthermore, it is imperative to recognize that integrating digital technologies in education has far-reaching implications for pedagogical practices and student learning outcomes (Hidayat & Khotimah, 2019). Thus, an in-depth analysis of the variables above is crucial in understanding the complex dynamics of ICT adoption among teachers in primary public schools in Asante Akim Central Municipality, Ghana. By examining the availability and types of ICT tools, assessing teachers' comfort levels and motivations towards these technologies, as well as considering their specific skill sets and usage habits, we can gain a comprehensive understanding of the current landscape and identify potential areas for improvement to ensure equitable access to digital education resources (Agyei & Voogt, 2011; Hidayat & Khotimah, 2019).

The demographic data collected from the study provides insightful revelations. For instance, the age groups between 20-30 and 31-40 constitute most respondents, with no participants beyond 60 years. This indicates a relatively young workforce, which, as the literature suggests, may be more receptive to digital technologies (Perdana, 2019). Furthermore, the data shows that most respondents have less than 15 years of teaching experience, which could further enhance their adaptability to evolving digital tools. The collected

demographic data yields valuable insights into the study. Notably, a substantial proportion of participants fall within the age brackets of 20-30 and 31-40, while no individuals above 60 were included in the sample. This demographic composition suggests a predominantly youthful labor force, a characteristic that the literature indicates may foster greater openness toward embracing digital technologies (Perdana, 2019). Moreover, the data reveals that most respondents possess less than 15 years of teaching experience, indicating a heightened potential for their adaptability to evolving digital tools (Zalat et al., 2021).

The teaching positions held by the participants were primarily Classroom and Subject teachers. The distribution of teachers across teaching levels – KG, Lower Primary, Upper Primary, and JHS – was relatively balanced, with a slightly higher number at the JHS level. These results further support the opportunities for ICT adoption as they highlight the diversity of roles and levels at which digital technologies can be utilized (Gümüş & Kukul, 2023). Furthermore, the wide distribution of participants across various teaching levels, namely KG, Lower Primary, Upper Primary, and JHS, exemplifies the extensive applicability of digital technologies, reinforcing the potential for ICT adoption in diverse educational settings. The balanced representation of Classroom and Subject teachers within the teaching positions held by the participants not only emphasizes the significance of their roles but also underscores the broad scope for integrating digital technologies, indicating ample opportunities for ICT adoption in both content-specific and general classroom contexts (Chigona & Chigona, 2010; Falloon, 2020a; Hsu, 2010).

Most interestingly, the access to ICT tools among the teachers varied significantly. Most teachers had access to smartphones or tablets, followed by laptop computers and USB flash drives. However, access to statistical software could have been much higher, potentially reflecting a lack of exposure or training in this area (Valverde-Berrocoso et al., 2021). Furthermore, it is imperative to note that the availability of ICT resources exhibited considerable disparity among educators. Predominantly, teachers possessed smartphones or tablets, closely trailed by laptop computers and USB flash drives. Nevertheless, it is crucial to highlight the paucity of access to statistical software, suggesting a possible dearth of exposure or inadequate training in this particular domain (Johnson et al., 2016). Moreover, the discrepancy in the accessibility of ICT tools among the teaching faculty is a noteworthy aspect. Most teachers had the

privilege of utilizing smartphones or tablets, followed by laptop computers and USB flash drives. However, the limited availability of statistical software stands out significantly, possibly indicating a need for more exposure or training in this field (Ghavifekr & Rosdy, 2015).

Explaining the findings, the contrast with Ofori's (2019) study suggesting widespread access to statistical software among teachers could be due to different contextual or socioeconomic factors or even differences in the study's methodologies (Ofori, 2019). On the other hand, the higher access to laptops over desktop computers might reflect a trend toward portable digital devices for professional use. Furthermore, it is imperative to consider the potential influence of contextual variables such as geographical location, educational infrastructure, and economic conditions on teachers' varying access to statistical software, as highlighted by the disparities observed in Ofori's (2019) study. Moreover, the divergence in access between laptops and desktop computers may also stem from evolving preferences in the professional sphere, where the convenience and mobility offered by portable digital devices have become increasingly favored over traditional desktop setups (Newhouse, 2013; Ofori, 2019).

The implications of these findings are significant. If teachers are equipped with the right digital tools and skills, it could dramatically improve the quality of education and potentially reduce the digital divide in the region (Sarpong, 2021). However, the lack of access to specific ICT tools, like statistical software and printers, can hinder the full integration of digital technologies in educational settings. The findings of this study illuminate the state of digital technology access among teachers in Asante Akim Central Municipality, Ghana. They highlight the need for continued investment in ICT tools and teacher training to further bridge the digital divide (Falloon, 2020a; Sarpong, 2021). However, these findings should be taken with caution, as they are context-specific and may not reflect the broader picture across all schools or regions in Ghana. Future studies should aim to replicate and expand upon this research in other geographical and institutional contexts to understand better the factors influencing teachers' access to digital technologies.

CONCLUSION

This study aimed to evaluate access to digital technologies among teachers in Asante Akim Central Municipality's Public Basic Schools in Ghana, revealing a significant level of access, with smartphones being the most used. Teachers were generally motivated to use these technologies, believing they could improve work performance and decision-making processes. Skill levels were high overall, though usage of statistical software remained notably low. These findings significantly impact stakeholders integrating digital technologies into education sectors, particularly in developing countries. They provide an understanding of the current digital technology landscape in Ghanaian public primary schools, informing potential strategies for ICT implementation. The limitations of this study lie in its geographical scope, suggesting future research to include broader regions or different developing countries and explore in-depth the reasons behind the everyday use of specific digital tools. A more comprehensive and comparative study could enhance our understanding of factors affecting teachers' digital technology access and inform better-tailored policy and educational training initiatives.

REFERENCES

Acharya, A. S., Prakash, A., Saxena, P., & Nigam, A. (2013). Sampling: Why and how of it? *Indian Journal of Medical Specialities*, *4*(2), 330–333.

Agyei, D. D., & Voogt, J. (2011). Exploring the potential of the will, skill, tool model in Ghana. *Predicting Prospective and Practicing Teachers' Use of Technology*, *56*(1), 91–100. https://doi.org/10.1016/j.compedu.2010.08.017

Akinde, T. A., & Adetimirin, A. A. (2017). Perceived usefulness as a correlate of the extent of Information and Communications Technologies (ICTs) used for teaching by library educators in universities. *International Journal of Library and Information Science*, *9*(April), 14–24. https://doi.org/10.5897/IJLIS2016.0739

Alobaid, A. (2020). Smart multimedia learning of ICT: Role and impact on language learners' writing fluency— YouTube online English learning resources as an example. *Smart Learning Environments*, *7*(1), 24. https://doi.org/10.1186/s40561-020-00134-7

Atuahene, E. (2019). Integrating technology (ICT tools) in teaching and learning – a case study of Offinso College OF Education, Ofinso, Ghana. *European Journal of Education Studies*, *5*(11), 278–295.

Ben Youssef, A., Dahmani, M., & Ragni, L. (2022). ICT Use, Digital Skills, and Students' Academic Performance: Exploring the Digital Divide. *Information*, *13*(3), Article 3. https://doi.org/10.3390/info13030129

Chaeruman, U. A. (2005). Mengintegrasikan teknologi informasi dan komunikasi (tik) ke dalam proses pembelajaran: Apa, Mengapa dan Bagaimana? *Jurnal Teknodik*, 046–059. https://doi.org/10.32550/teknodik.v0i0.536

Chang, Y., Wong, S. F., & Park, M. (2016a). A three-tier ICT access model for intention to participate online: A comparison of developed and developing countries. *Journal Name*, *32*(5), 226–242.

Chang, Y., Wong, S. F., & Park, M. (2016b). A three-tier ICT access model for intention to participate online: A comparison of developed and developing countries. *Journal Name*, *32*(5), 226–242.

Chigona, A., & Chigona, W. (2010). Investigating Factors affecting the Use of ICT for Teaching in the Western Cape Schools. In *18th European Conference on Information Systems*, ECIS 2010 (pp. 1-12). Portsmouth, UK: Springer

Dogan, S., Dogan, N. A., & Celik, I. (2021). Teachers' skills to integrate technology in education: Two path models explaining instructional and application software use. *Education and Information Technologies*, *26*(1), 1311–1332. https://doi.org/10.1007/s10639-020-10310-4

Falloon, G. (2020a). From digital literacy to digital competence: The teacher digital competency (TDC) framework. *Educational Technology Research and Development*, *68*(5), 2449–2472. https://doi.org/10.1007/s11423-020-09767-4

Falloon, G. (2020b). From digital literacy to digital competence: The teacher digital competency (TDC) framework. *Educational Technology Research and Development*, *68*(5), 2449–2472. https://doi.org/10.1007/s11423-020-09767-4

Fitriyadi, H. (2013). Integrasi teknologi informasi komunikasi dalam pendidikan: potensi manfaat, masyarakat berbasis pengetahuan, pendidikan nilai, strategi implementasi dan pengembangan profesional. *Jurnal Pendidikan Teknologi Dan Kejuruan*, *21*(3), Article 3. https://doi.org/10.21831/jptk.v21i3.3255

Gamage, D., Ruipérez-Valiente, J. A., & Reich, J. (2023). Editorial: A paradigm shift in designing education technology for online learning: opportunities and challenges. *Frontiers in Education*, *8*, 1194979. https://doi.org/10.3389/feduc.2023.1194979

Garrison, D. R., & Kanuka, H. (2004). Blended learning: Uncovering its transformative potential in higher education. *International High Education*, *7*, 95–105. https://doi.org/10.1016/j.iheduc.2004.02.001

Gasaymeh, A. M., Al-hasanat, H. A., Kraishan, O. M., & Khaled, A. (2017). Motivational Factors Affecting the Integration of Information and Communication Technology (ICT) in Education by Teachers Members: A

Developing Country Perspective. *International Journal of Education*, *9*(3), 168–182. https://doi.org/10.5296/ije.v9i3.11667

Ghavifekr, S., & Rosdy, W. A. W. (2015). Teaching and Learning with Technology: Effectiveness of ICT Integration in Schools. *International Journal of Research in Education and Science* (IJRES), 1(2), 175-191

Gümüş, M. M., & Kukul, V. (2023). Developing a digital competence scale for teachers: Validity and reliability study. *Education and Information Technologies*, *28*(3), 2747–2765. https://doi.org/10.1007/s10639-022-11213-2

Hidayat, N., & Khotimah, H. (2019). Pemanfaatan teknologi digital dalam kegiatan pembelajaran. *JPPGuseda | Jurnal Pendidikan & Pengajaran Guru Sekolah Dasar*, *2*(1), 10–15. https://doi.org/10.33751/jppguseda.v2i1.988

Hsu, S. (2010). The Relationship between Teacher's Technology Integration Ability and Usage. *Journal of Educational Computing Research*, *43*(3), 309–325. https://doi.org/10.2190/EC.43.3.c

Johnson, A. M., Jacovina, M. E., Russell, D. G., & Soto, C. M. (2016). Challenges and Solutions when Using Technologies in the Classroom. In S. A. Crossley & D. S. McNamara (Eds.), *Adaptive Educational Technologies for Literacy Instruction* (1st ed., pp. 13–30). Routledge. https://doi.org/10.4324/9781315647500-2

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, *30*, 607–610.

Newhouse, C. P. (2013). Learning with portable digital devices in Australian schools: 20 years on! *The Australian Educational Researcher*, *41*(4), 471–483. https://doi.org/10.1007/s13384-013-0139-3

Ofori, E. (2019). Using Technology Acceptance Model to Promote Student Adoption and Use of Digital Technology At The Sunyani Technical University. *Journal of Basic and Applied Research International*, *25*(3), 1–13.

Ofosu-Appiah, J. (2017). The use of ICT in teaching and learning at the Wisconsin International University College (*MA thesis*). University of Ghana, Legon, Ghana.

Osman, H. (2017). Nursing Students' Experience with Information Literacy Skill. *Yangtze Medicine*, *01*(03), 157–168. https://doi.org/10.4236/ym.2017.13016

Paul, C., & Chandak, S. R. (2019). Adapting to Educational Technology in the Traditional U G Classroom: A Pilot Study to improve ICT usage in an Undergraduate College. *XXXXVII*, *2*.

Perdana, A. (2019). Generasi Milenial dan Strategi Pengelolaan SDM Era Digital. *Jurnal Studi Pemuda*, *8*(1), 75. https://doi.org/10.22146/studipemudaugm.45287

Player-Koro, C. (2012). Factors Influencing Teachers' Use of ICT in Education. *Education Inquiry*, *3*(1), 93–108. https://doi.org/10.3402/edui.v3i1.22015

Prensky, M. (2001). Digital Natives, Digital Immigrants. On the Horizon, 9(5), 1-6. *MCB University Press*

Sampath, V., Ganesan, A., & Edison.K, T. A. (2022). Online Learning: ICT-Based Tools for Interaction and Effectiveness. *ECS Transactions*, *107*(1), 10277–10284. https://doi.org/10.1149/10701.10277ecst

Sarpong, G. (2021). Evaluating teachers' access to digital technologies in basic schools in Asante Akim Central Municipality (*Master of Science thesis*). University of Education, Winneba, Ghana.

Shirazi, F., Heidari, S., Fard, S. J., & Ghodsbin, F. (2019). Use by Iranian Nursing Students: Facilitators Pattern of Internet. *August*. https://doi.org/10.17533/udea.iee.v37n2e06.Vol

Soomro, K. A., Kale, U., Curtis, R., Akcaoglu, M., & Bernstein, M. (2018). *Development of an instrument to measure Faculty's information and communication technology access*.

Valverde-Berrocoso, J., Fernández-Sánchez, M. R., Revuelta Dominguez, F. I., & Sosa-Díaz, M. J. (2021). The educational integration of digital technologies preCovid-19: Lessons for teacher education. *PLOS ONE*, *16*(8), e0256283. https://doi.org/10.1371/journal.pone.0256283

Vassilakopoulou, P., & Hustad, E. (2023). Bridging Digital Divides: A Literature Review and Research Agenda for Information Systems Research. *Information Systems Frontiers*, *25*(3), 955–969. https://doi.org/10.1007/s10796-020-10096-3

Yusuf, M. O., & Onasanya, S. A. (2004). Information and communication technology (ICT) and technology in tertiary institution. In *Teaching in Tertiary Institutions* (pp. 67–76). Ilorin: Faculty of Education.

Zalat, M. M., Hamed, M. S., & Bolbol, S. A. (2021). The experiences, challenges, and acceptance of e-learning as a tool for teaching during the COVID-19 pandemic among university medical staff. *PLOS ONE*, *16*(3), e0248758. https://doi.org/10.1371/journal.pone.0248758