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DIGITAL LITERACY: TEACHERS CHALLENGES INTEGRATING GRAPHIC DESIGN TECHNOLOGY IN THE CLASSROOM

George Kushiator[1], Innocent Y Klodzi[2], Inusah Hamidu[3]
Kwame Nkrumah University of Science and Technology, Kumasi, Ghana[1,2],
Wa Technical University, Wa, Ghana[3]
Email: gkushiator1@gmail.com[1], klodziinnocent@gmail.com[2], yhamidudaabu@yahoo.com[3]

Abstract

Since the development and introduction of digital technology in Ghana. The government has made the effort to supply computers to schools and individuals to accentuate the digital literacy in schools and colleges. Since then, most visual art teachers have not been able to integrate the use of information and communication technology in teaching students in the classroom Therefore, exploiting the use of Information and Communications Technology (ICT) in the visual arts classroom has been rather challenging. As a result, there is an urgent need to investigate these factors as they influence negatively on the young Senior High Schools graphic design students to become digital literate in the 21st century. The study therefore investigates the challenges design teachers face in teaching graphic design in t schools in the wake of the 21st century. This study uses a descriptive survey method. The study was conducted quantitatively where questionnaires were designed and distributed to 10 art teachers using simple random sampling. Employing the purposive sampling methodology in the selected Senior High School in where visual arts is taught in the Ho Municipality. The outcome of this study revealed that GD teachers do not make use of ICT in teaching graphic design in schools. it is recommended that teachers should be trained to use ICT software to teach and impart knowledge in the classroom

Keywords: *digital literacy, teachers, computer, education, technology*

INTRODUCTION

The development of digital technology in recent times has seen the introduction and supply of computers to schools and individuals to accentuate the digital literacy in education. Digital literacy is not a stationary concept; a change in ICT means being digitally literate; this shift must also develop to ensure that learners learn and apply skills for knowledge discovery, transfer, research, analysis and communication in applicable emerging technologies (Owen et al., n.d). Owen believed that as a key learning outcome for digital literacy, ICT will build on what has already been learned. Yazon et al. (2019), opined that in order to thrive in an increasingly digital environment, digital literacy requires a wide range of skills, all of which are required. It plays an important role at present in the process of teaching and learning. Educators are increasingly expected to teach digital instruments to students as their teaching aids. Technology also aids teachers in designing lesson plans that are successful, imaginative, and engaging, resulting in active learning among students.

Since the development and introduction of digital technology in Ghana. The government has made the effort to supply computers to schools and individuals to accentuate the digital literacy in schools and colleges, Since then, most visual art teachers have not been able to integrate the use of information and communication technology in teaching students in the classroom Therefore, exploiting the use of Information and Communications Technology (ICT) in the visual arts classroom has been rather challenging. Teachers hardly make use of computer in the visual arts class.

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As a result, there is an urgent need to investigate these factors as they influence negatively on the young Senior High Schools graphic design students to become digital literate in the 21st century. This is because the creation of digitally literate teachers, to confidently teach in adoption of digital learning modes in higher education (Claire & Crystal, 2019. Therefore, the objective of this study is to investigate Graphic Design teachers challenges in using digital technology to teach art and design works in Senior High School. The research question is what are the challenges faced by graphic design teachers using digital technology to teach art and design works in schools?

LITERATURE REVIEW

The basic skills and competencies for digital literacy, according to Pischetola (2011), are operational skills, which relate to the general ability to work with hardware and software, as stated by Van Dijk (2008). The most common viewpoint, according to Pischetola, is that access to technology is guaranteed until these capabilities are perfected. Digital literacy, according to Van Dijk, is the ability to comprehend digital content.

In today's modern world, digital literacy skills are expected (Sario, 2019). And so Sario believe that text, photographs, and multimedia are all examples of these abilities. He suggested that future teachers who will be working with tech-savvy students should develop the skills and knowledge necessary to work with the rapidly evolving tools and software. Digital literacy entails a great deal more than just knowing how to use a computer (Vanek, n.d). Vanek cited Ankshear and Knobel (2008), who claimed that good functioning in digital spaces and with digital media necessitates a diverse set of skills, and as part of this basis, he listed basic programming skills as one of the skills required in the digital space. Basic computer skills, according to Vanek, are the abilities needed to use digital devices and complete basic tasks with them.

Teaching is the process of imparting knowledge, constructive judgment, and well-developed wisdom to a learner through a learning medium, often known as a teaching tool. Teaching, according to Ayua (2019), encompasses both methods and practices aimed at passing on information, skills, and knowledge at all stages of schooling.

Teachers use this to challenge the three areas of perceptual, affective, and psychomotor development (Dorgu, 2015). According to Dorsu, a teaching approach is the technique through which an instructor delivers his or her subject matter to students based on certain established educational goals in order to facilitate student achievement. Citing from their work Dorsu is of the view that effective implementation of any curriculum depends to a large extent on the availability of various ‘methods of teaching’ (Intarapanich 2012 pg. 308). Thus, teaching is an effort to influence awareness, a set of structured exercises aimed at assisting the learner in changing their behaviour and acquiring skills. Teaching method, according to Dorsu, is any teaching technique that can be used to promote students' learning and fulfilment.

In the digital era, ICT use in the classroom is essential for students to learn and apply needed 21st century skills (Zimmer, 2010), as well as technology and technology improved teaching in classrooms (Thieman, 200). As cited by Yazon et al., (2019) in the work of

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(Holmstrom, 2013), basic skills in Information and Communication Technology (ICT), or the use of computers to retrieve, assess, store, produce, present, and exchange information, as well as communicate and participate in collaborative networks via the internet, underpin digital literacy skills. According to Yazon, digitally literate teachers and students should be able to perform basic computer-based operations and access everyday resources

METHOD

This study uses a descriptive survey method. Descriptive research is an appropriate choice when the research aim is to identify characteristics, frequencies, trends, and categories (Ary et al., 2010). Ary also noted that descriptive survey is used to obtain information concerning the current status of the phenomena and to describe "what exists" regarding variables or conditions in the context. This design focuses on the present condition and aims to find a new truth as cited by Yazon et al. (2019) in the work of (Calmorin and Calmorin. 2010).

The population under study was all Senior high school in Ho Municipality where Visual art is studied. Out of this population, a sampling frame of all Senior High School where Graphic Design teachers in the Ho Municipality was obtained. The Municipality is made up of Ten (10) Senior High Schools and Visual Art is studied in Nine (9) out of the Ten (10) Senior High schools. All the Nine Senior High schools represented the target population and these Nine Schools includes Mawuli Senior High, Mawuko Senior High, Ola Senior High, Taviefe Senior High, St. Prospers Senior High, Wallas Academy, Sokode Senior High, and Tanyigbe Senior High. The researcher would generalize the outcome based on the result analysed from the accessible population.

Purposive sampling method was used for the study to set the sample size. Purposive sampling also referred to as judgmental or expert sample and is a type of non-probability sample that can logically assumed to be representation of the population and involves cases or participants in the sample because they believe that they warrant inclusion (Taherdoost, 2016), (Encyclopaedia of Survey Research Method, 2008). In effect the adoption purposive sampling method saw the selection of four High Schools namely Mawuli Senior High, Mawuko Senior High, Ola Senior High, Taviefe Senior High to formulate the sample from the target population in the Senior High Schools within the Ho Municipality in Volta Region of Ghana.

Simple random sampling is a sampling procedure where the elementary units of the universe are chosen in such a way that each draphic design teacher has an equal chance of being selected as note by Taherdoost, 2016. Aside this, questionnaires for teachers were administered to 10 Graphic design teachers from the purposively selected High Schools.

Table 1. Testing for Reliability for Graphic Design Teachers' Variables

Reliability Statistics	
Cronbach's Alpha	No of Items
0.754	22

Source: Fieldwork, June 2021

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From the reliability statistics above in table 1.3, it is observed that the Cronbach's Alpha is 0.754, which means that the measurement has an acceptable degree of reliability assured for the variables used to measure ICT skills required for teaching and learning graphic design, why GD students find it difficult to do basic design using ICT gadget, and challenges of using ICT tools in the classroom by GD students at the S.H.S.

Table 2. Teachers Responds to *the challenges of using ICT tools in teaching and learning Graphic Design in the classroom in the Senior High School.*

	Variable	Measurement	Frequency	Percentage
1	ICT facilities are available in the school ICT Lab.	Yes	7	70.0
		No	3	30.0
2	The school has access to the internet	Yes	6	60.0
		No	4	40.0
3	Supervision of student to involve ICT use in graphic design project	Yes	2	20.0
		No	8	80.0
4	Students prefer ICT tools over traditional techniques	Yes	8	80.0
		No	2	20.0
5	Students are comfortable designing communication media with traditional technique	Yes	6	60.0
		No	4	40.0
6	Students have note on how to integrate ICT in graphic designing	Yes	4	40.0
		No	6	60.0
7	I teach students about the use of ICT in graphic designing	Yes	2	20.0
		No	8	80.0
8	There are topics on the use of computer to create communication media	Yes	9	90.0
		No	1	10.0
9	We have computers in the schools design studio	Yes	1	10.0
		No	9	90.0
10	I have laptops and other ICT- based teaching aids	Yes	3	30.0
		No	7	70.0
11	I am able to change the culture of traditional approaches	Yes	4	40.0
		No	6	60.0
12	Students are permitted to utilize the computer lab at school	Yes	4	40.0
		No	6	60.0
13	Computer can be a useful tool for graphic designing	Yes	9	90.0
		No	1	10.0
14	Computer tools are faster to use than traditional tools	Yes	7	70.0
		No	3	30.0
15	Computer aided arts software is listed in the GD curriculum	Yes	10	10.0
		No	0	0.0
16	Can use at least two application software to design	Yes	6	60.0

		No	4	40.0
17	Have demonstrated the use of one design software to my students	Yes	4	40.0
		No	6	60.0
18	Students are able to utilize ICT to create due to accessibility of computers	Yes	1	10.0
		No	9	90.0
19	WAEC not encouraging students to create their WASSCE practical using ICT tools	Yes	10	100
		No	0	0.0
20	I urge students to use both ICT and traditional approach in class	Yes	3	30.0
		No	7	70.0
21	I urge students to use E-learning, remote and collaborative learning approaches	Yes	2	20.0
		No	8	80.0
22	I gain understanding in pedagogy content and technology in ICT integration at professional development workshop	Yes	1	10.0
		No	9	90.0
	N		**10**	**100**

Source: Fieldwork, June 2021

Per the result from table 1.5 taking variable 1 into consideration, it is revealed that 7 teacher representing 70.0% of the GD teachers responded yes that ICT facilities are available in their school ICT Lab whilst3 (30.0%) of the GD teachers responded No. This implies that majority of the schools have ICT laboratory needed for ICT integration and digital literacy.

Coming to variable 2 it is also revealed that 6 teachers representing 60.0% of the GD teachers responded their schools have access to internet as 4 (40.0%) of the GD teachers responding no. This implies that majority of the schools have internet access which can have a great effect on ICT integration and digital literacy.

Whether GD teachers supervise students to involve ICT in graphic design project as per variable 3, the result showed that 2 teachers representing 20.0% of the GD teachers responded yes whilst 8 (80.0%) of the GD teachers responded no. This shows that majority of the teachers do not supervise GD students to involve ICT use in graphic design project.

The result showing in variable 4 revealed 8 teachers representing 80.0% of the teachers responded that their students prefer ICT tools over traditional techniques whilst 2 (20.0%) teachers responded no. This means that majority of the GD teachers denied students to use ICT tools as their preferred tool over traditional techniques.

In variable 5, the result showed that 6 teachers representing 60.0% of the GD teachers responded that their students are comfortable designing communication media with traditional technique whilst 4 (40.0%) teachers responded no. This indication showed that majority of the teachers are of the view that GD students are comfortable designing communication media with traditional.

Per the result in variable 6, it is revealed that 4 teachers representing 40.0% of the GD teachers responded yes to say that they give a lot notes to students involving how to integrate

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ICT in graphic designing and 6 (60.0%) of the GD teachers responded no. This indicated that majority of the GD teachers do not give GD students notes on how to integrate ICT in graphic designing.

This notwithstanding in variable 7 the result showed that 2 teachers representing 20.0% of the GD teachers responded yes that they teach their students about the use of ICT in graphic designing whilst 8 (80.0%) teachers responded no. It implied here that majority of the GD teachers do not teach their students about the use of ICT in graphic designing.

Meanwhile variable 8 revealed that 9 teachers representing 90.0% of the GD teachers responded yes that there are a lot of topics on the use of computer to create communication media whereas 1 (10.0%) teacher responded no. This also shows that majority of the teachers are aware that there are lot of topics on the use of computer to create communication media.

Also responding to variable 9, the result show that 1 teacher representing 10.0% of the GD teachers responded yes to say that there are computers in their school's design studio while 90 (90.0%) teachers responded no. This indicates that most schools do not have computers in the school's design studio.

Result from variable 10 showed that 3 teachers representing 30.0% of the GD teachers responded yes that they have laptops and other ICT- based teaching aids while 70 (70.0%) teachers responded no. This implies that most teachers do not have personal laptops and other ICT- based teaching aids which can help them make a meaningful impact in ICT integration leading to digital literacy among graphic design students.

Due to this, result from variable 11 revealed that 4 teachers representing 40.0% of the GD teachers responded yes that they are able to change the culture of traditional approaches while 6 (60.0%) of the GD teachers responded no. This implied that majority of the teachers are unable to change the culture of traditional approaches in design for GD students.

Meanwhile responding to variable 12 revealed that 6 teachers representing 60.0% of the GD teachers responded no with 4 (40.0%) of the GD teachers responding yes. This means majority of the GD teachers do not permit their students to use the computer in the school's computer lab.

Per the result from variable 13, it is revealed that 9 teachers representing 90.0% of the GD teachers responded yes to say that they think that computer can be a useful tool for graphic designing and only 1 (10.0%) of the GD teachers responded no. This implied that most GD teachers think that computer can be a useful tool for graphic designing.

Result from variable 14 revealed that 7 teachers forming 70.0% of the GD teachers responded yes to say that they think computer tools are faster to use than traditional tools whilst 3 (30.0%) of the GD teachers responded no. This means that majority of the GD teachers believed that computer tools are faster to use than traditional tools.

Responding to variable 15 it is revealed that 10 teachers which are 100% declared that the GD curriculum outline the use of Computer aided arts software. This implied that all the teachers are aware that the GD curriculum outline the use of Computer aided arts software.

Also result from variable 16 showed that 6 teachers representing 60.0% of the GD teachers responded that they can use at least two application softwares to design whilst 4

(40.0%) of the GD teachers responded no. This showed that most GD teachers can use at least two application softwares to design.

Per the result from variable 17, it is revealed that 4 teachers representing 40.0% of the GD teachers responded yes that they demonstrated to their students how to use of one design software to do design whilst 6 (60.0%) of the GD teachers responded no. This indication showed that majority of the teachers never demonstrated the use of at least one design software to their students.

Coming to variable 18, the result revealed that 1 teacher representing 10.0% of the GD teachers responded yes to say that their GD students are able to utilize ICT to design due to accessibility of computers whilst 9 (90.0%) of the GD teachers responded no. This implies that majority of the teachers said their GD students are unable to utilize ICT to design due to inaccessibility of computers.

With variable 19, the result showed that 10 teachers representing 100% of the GD teachers responded yes to say that WAEC do not encourage students to create their WASSCE practical using ICT tools. This shows that all the teachers agree to the fact that that WAEC do not encouraging students to create their WASSCE practical using ICT tools.

To know whether GD teachers urge students to combine both ICT and traditional approach in class in variable 20, the result shows that 3 teachers representing 30.0% of the GD teachers responded yes whilst 7 (70.0%) teachers say no. This implies that most GD teachers do not urge GD students to combine both ICT and traditional approach in class, Per the result in variable 21, it is revealed that only 2 teachers representing 20.0% of the GD teachers responded yes to say that they urge their students to use E-learning, remote and collaborative learning approaches whilst 8 (80.0%) of the GD teachers say no. This implies that majority of the GD teachers have not urged GD students to use E-learning, remote and collaborative learning approaches.

Coming to variable 22 which is the last variable in this section, it is revealed that 9 teachers representing 90.0% of the GD teachers declared ‘no’ to say that they gain understanding in Technological Pedagogical Content Knowledge, TPACK in ICT integration at professional development workshop whilst only 1 (10.0%) of the GD teacher responded yes that they do so. This means that majority of the GD teachers do not gain understanding in Technological Pedagogical Content Knowledge, TPACK in ICT integration at professional development workshop.

RESULT AND DISCUSSION

The challenges of using ICT tools in teaching and learning Graphic Design in the classroom in the Senior High School

Owing to this, GD teachers have not taught GD students even one Design Software due to this GD Students are un able to make excellent use of at least one design program. For that matter inability of posting GD works on social media by student is a challenge. This shows that the content knowledge as well as technology pedagogical knowledge as described in TPACK is lacking among GD teachers. Because in the GD syllabus 2010, it is stipulated that GD students must be taught how to use a computer to produce greeting cards, posters,

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and other printed materials. It was stressed that the device, along with its accessories and other ICT gadgets, can be used to improve graphic design teaching and learning, as well as tasks such as drawing, designing, painting, layout designing, composing, illustration, cartooning, and animation. By so doing GD students are having no chance to post their design works on social media making their digital literacy ability deficient (Spires et al, 2017) and (Hague, 2011).

Coming to the view point of teachers on the challenges of using ICT tools in teaching and learning Graphic Design in the classroom in the Senior High School, teachers gave positive response in table 1.5 for variable 1, 2, 4, 5, 8, 13, 14, 15, and 16

1. ICT facilities are available in the school's ICT Lab.
2. The school has access to the internet.
4. Students prefer ICT techniques over traditional techniques.
5. Students are comfortable designing communication media with traditional technique.
8. There are topics on the use of computer to create communication media.
13. Computer can be a useful tool for graphic designing.
14. Computer tools are faster to use than traditional tools.
15. Computer aided arts software is listed in the GD curriculum.
16. I can use at least two application softwares to design.

Taking the above variables in table 1.5 into consideration, it is a clear indication of ICT integration in the teaching of graphic design can lead to some extend digital literacy among GD students at the S.H.S. level in Ho municipality. Since the variables above promote ICT integration in the teaching of graphic design which have a great potential to translate into digital literacy ability GD students the, variables here do not pose any challenges to the use of ICT tools in teaching and learning Graphic Design in the classroom in the Senior High Schools. It is clear to say that most schools in the Municipality have ICT facilities with availability of school's ICT Lab, access to the internet (Valverde-Berrocoso et al 2020). For this reason, GDstudents prefer ICT techniques over traditional techniques, since teachers are aware that there are topics on the use of computer to create communication media that can inure into student digital literacy ability. The only affirmative response here which mitigated ICT integration in the teaching and learning of graphic design is the comfort most GD students feel designing communication media with traditional technique.

Most teachers also gave a negative response to show the challenges of using ICT tools in teaching and learning Graphic Design in the classroom in the Senior High School in table 1.5 for variable 3, 5, 6, 7, 9, 10, 11, 17, 18, 19, 20, 21, and 22 as presented as follows

3. Not supervising student to involve ICT use in graphic design project.
5. Lack or no notes for GD students on how to integrate ICT in graphic designing
6. Not teaching GD students about the use of ICT in graphic designing.
7. Not able to change the culture of traditional approaches.
9. We have computers in the school's design studio
10. I have laptops and other ICT- based teaching aids
11. Not permitting GD students to utilize the computer lab at school.
17. Not demonstrating the use of one design software to my students.

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18. Students are unable to utilize ICT to design due to inaccessibility of computers.
19. WAEC not encouraging students to create their WASSCE practical using ICT tools.
20. Not urging students to use both ICT and traditional approach in class.
21. Not urging students to use E-learning, remote and collaborative learning approaches.
22. Not gaining understanding in pedagogy content and technology in ICT integration at professional development workshop.

The above variables have been identified as the challenges of using ICT tools in teaching and learning Graphic Design in the classroom in the Senior High School. Looking at them one after the other, the response by GD teachers to variable 3 proved that teachers do not ensure that GD students involve ICT use in graphic design project. This is a clear indication that teachers lack Technological Pedagogical Knowledge (TPK) of Educational Technology in Graphic design thereby restricting them from ensuring that GD students involve the technology. Hence GD students cannot practice the needed skill involved to develop positive attitude in line with ICT use in graphic design (Beetham and Sharpe 2011). Owing to this, variable 5 derived a trait from variable 3 which indicated that GD students are comfortable designing communication media with traditional technique but the GD students are not given the needed guidance to work with the ICT techniques. And so GD students lack the needed exposure (appropriate experience) that can lead to capability growth in them, leading to successful activities and familiarity with the characteristics of a successful digital learner (Beetham and Sharpe 2011). According to Beetham and Sharpe lack of the digital experience leads to low attitude towards technology which decrease student ability to learn new practice, improve new ability and gain new entry. Since students have not received the necessary ICT exposure to design for which reason, they are comfortable designing communication media with traditional technique.

Variable 7 also affirmed the lack pedagogical technological knowledge needed for ICT integration. This is seen as teachers never taught GD students about the use of ICT tools (computer) in graphic designing. But to the teachers they have no computers in the school's design studio.

This is pointing to the fact that access to some ICT tools like computers are lacking in the schools. Access to computer is base line for students' digital literacy ability (Beetham and Sharpe's 2011). Also variable 10 confirmed access to computers that most GD teachers do not have laptops and other ICT- based teaching aids by themselves. Since teachers lack the approach to TPACK model of ICT integration and they lack computers in the ICT studio and some for themselves, variable 11 proves that most of them are unable to change the culture of traditional approaches in teaching the graphic design.

CONCLUSION

The third objective which sort to find out challenges of using ICT tools in teaching and learning Graphic Design in the classroom in the Senior High School revealed the following indicators are the challenges. The over use of traditional methods in project - based lessons. Teachers not teaching GD students how to use ICT tools during project-base lesson.

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Their school or the visual art department in their school having not installed even one design software on the computers in their design studio or their ICT lab.

Teachers on the other hand gave responses which revealed the challenges of using ICT tools in teaching and learning Graphic Design in the classroom in the Senior High School. These are on the indicators that teachers do not supervise GD student to involve ICT use in graphic design project. Teacher's inability to give notes to GD students on how to integrate ICT in graphic designing. Not teaching GD students about the use of ICT in graphic designing. Inability of GD teachers to change the culture of traditional approaches. GD teacher not permitting GD students to utilize the computer lab at school to do their design works. GD teachers not demonstrating the use of one design software to GD students. GD students are unable to utilize ICT or computer application software to design due to inaccessibility of computers.. GD teachers not urging GD students to use both ICT and traditional approach in class. GD teachers not urging GD students to use E-learning, remote and collaborative learning approaches. GD teachers not gaining understanding in pedagogical content and technological knowledge in ICT integration at professional development workshop. These revealing indicators from the GD teachers showed that ICT integration in teaching graphic design is not effective. The result of this affects GD students' digital literacy ability.

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