

# Challenges of using ICTs in Teaching and Learning of Clothing and Textiles in The Colleges of Education in Ghana

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## ABSTRACT

The purpose of the study was to identify the challenges that tutors and student teachers at Colleges of Education encounter in using ICTs in learning and teaching of clothing and textiles. The current study employed concurrent triangulation research design under mixed method approach for the study. The study used QUANT + qual because the researcher seeks to supplement the quantitative data with the qualitative data to get in-depth understanding of the challenges in the integration of ICTs in the teaching and learning of clothing and textiles. The population of the study consisted of two hundred and thirty (230) of level 200 and level 300 student teachers offering clothing and textile and all 8 tutors teaching clothing and textiles in the four selected Colleges of Education in the CENTWEST zone of Ghana. In the qualitative phase, simple random sampling was used to select four (4) student teachers from each of the four colleges while purposive sampling was used to select all the teachers teaching clothing and textiles in the four colleges of education in the CENTWEST zone of Ghana. This make a total sample of students' teachers to be sixteen (16) and the eight teachers for the qualitative phase. Data for the study were gathered using a questionnaire and semi-structured interview instruments. Utilizing descriptive statistics like means and standard deviations, coefficient of variations, and thematic analysis to analyse the quantitative data. The results indicated that there are a few challenges that student teachers and tutors encounter on using ICTs for Learning Clothing and Textiles which include: insufficient number of computers, insufficient internet access, lack of software for teaching clothing and textiles, Absence of CAD to design curves in 2D/3D as well as absence of system for monitoring and evaluating ICTs enhancement in the colleges.

## INTRODUCTION

Clothing and textiles, as a skill-oriented subject, can provide individuals with the fundamental skills and knowledge needed to work for themselves (Forster, Quarcoo, Ashong & Ghanney, 2017). Considering this, ICT resources can be used to learn about clothing and textiles. The use of ICTs in education can lead to cost-effective learning, bridge the gap between teachers and students, and significantly improve learning and teaching quality (Papanastasiou, Drigas, Skianis, Lytras & Papanastasiou, 2018). Multiple sensory delivery, greater communication skill, cooperative learning, increasing critical thinking, and increased self-expression and active learning are some of the benefits of ICTs in education (Matsiola, Spiliopoulos, Kotsakis, Nicolaou & Podara, 2019). The use of ICTs in education can result in cost-effective learning, bridge the gap between teachers and students, and improve overall learning and teaching quality (Papanastasiou et.al., 2018). Bam and Orwig (2015), on the other hand, highlighted some of the advantages of ICTs in education, such as multiple sensory delivery, improved communication skills, cooperative learning, critical thinking promotion, and increased self-expression and active learning (Asamoah, 2021). More succinctly, Salihi (2015) summarized the potential of ICTs in education by stating that they aid in expediting and improving course work production; improving motivation and engagement; supporting exploration and experimentation; and fostering self-regulated and collaborative learning

The role of the instructor is to provide a conducive learning atmosphere for the pupils as well as to guide them in the appropriate route (Rahimi & Karkami, 2015). Teachers must be aware of the potential of technology to assist them in facilitating effective teaching and learning, rather than relying solely on traditional techniques to fulfill this function (Kessler, 2018). The instructor must not only be familiar with specific technology, but also

with its affordances and restrictions, as well as how to apply adaptive tactics in conjunction with these technological aspects to increase holistic learning (Jeong & Hmelo-Silver, 2016). Due to the growth of new information technology, the new era of ICTs in education should be created quickly and to an acceptable amount in order to match the competence of students and teachers in educational experience. Tutors can employ technology in a variety of ways in the classroom. Technology, for example, can be used to make clothing and textiles lessons more engaging, providing feedback, assessment tools, evaluation, and exploration, among other things. This part focuses on the use of technology in the classroom by Ghanaian basic school clothing and textiles tutors. According to Hennessy, Deaney, and Ruthven (2005), using ICTs allows students and teachers to check, trial, and revise their work, implying that ICT allows for fast feedback and fosters self-correction (Audí, Puig & Fonseca-Escudero, 2016).

Using technology to perform physical labor such as computations or sketching frees the student and teacher to concentrate on techniques and enables a trial-and-error approach (Hennessy, S., Ruthven, K., & Brindley, S. (2005). The graphing process is sped up by technology, allowing students to focus on analyzing and reflecting on data correlations (Hennessy et al., 2005). The use of technology also allows teachers to be more creative and provide more engaging teaching materials by utilizing the features of ICT (Asad, Hussain, Wadho, Khand & Churi, 2021). This means that when technology is used to help teaching and learning, it becomes more meaningful and entertaining.

Traditional design processes such as manual flat pattern fabrication, draping, and line drawing are still taught in most technical universities that offer clothing and textile programs (Aderogba, 2012). Teachers can use computers to enhance students' learning experiences by providing them with a variety of learning tools, expert opinions, and alternate perspectives (Quarshie, 2015). Modern computer-aided design and manufacture (CAD/CAM) software packages that are specifically for textiles, clothing, and fashion designing and manufacturing should be included in clothing and textile programs (Špelic, 2020). AutoCAD, OptiTex, Lectra, and Gerber are some examples of modern CAD software packages used in the textiles, clothing, and fashion industries that need to be incorporated into the teaching and learning of clothing and textile programs (Adwoa-Oppong, Biney-Aidoo & Antiaye, 2013).

AutoCAD is a computer-aided design (CAD) tool used for 2-Dimensional (2D) and 3-Dimensional (3D) design, drafting, and building of Textiles and Clothing designs and artifacts, according to Al-Mousa (2013). AutoCAD, according to Mok, Xu, Wang, Fan, Kwok and Xin (2013) is useful software that design students can use to shape design creations since it can develop shapes and forms that are beyond the designer's ability. Johnson (2005) looked at undergraduate design students and practitioners in the fields of fashion, architecture, graphic, product, and general design, and found that AutoCAD is not simply a drafting tool, but also a conceptual tool that may help students come up with new ways to think about design. Yazıcıoğlu (2011) agrees, stating that AutoCAD can document design progress and allow for independent evaluation of different stages of the design process.

According to Adwoa-Oppong et al. (2013), Opti Tex software should be used in the teaching and learning of clothes and textiles. Opti Tex software, according to Park and Lee (2011), can be used for two-dimensional pattern design as well as three-dimensional design and manufacturing. The software includes 3D models, virtual prototyping, and a pattern design option that simplifies pattern cutting instruction. The availability and use of this software in numerous educational institutions, however, is still a mirage because only a few numbers used them. For the textiles and garment industries, Opti Tex has been acknowledged as a prominent provider of 3D Virtual prototyping and 2D CAD/CAM software solutions. It also develops an avatar based on one's exact measurements, which can be tried on with various outfits to select the best fit. Opti Tex also makes it simple to digitalize curves, build a customized working environment, and create a variety of patterns. Lectra is another CAD/CAM software program that needs to be integrated into apparel and textiles education and learning. The Lectra software packages, according to Jhanji (2018) include 2D and 3D design, drafting, and virtual construction programs.

According to Park and Lee (2011), Lectra software allows students studying apparel and textiles to make technical drawings of fashion designs. Lectra allows you to digitize paper patterns, adjust designs, define grade rules, and more. They went on to say that the software package's 3D component enables for texture mapping

and sample garment visualization. Per the studies conducted in Africa, the usage of relevant software for learning and teaching clothing and textiles in colleges of education is restricted. According to Wambau-Kamau (2012), the limited use is due to the high cost of the software packages, which prevents lecturers and students from using them. In another study, Adwoa-Oppong et al. (2013) discovered that the apparel and textiles departments in Ghanaian universities and colleges face obstacles such as a lack of computers and funds to purchase the necessary software packages. According to African studies, the usage of relevant software for studying and teaching clothing and textiles in educational institutions is minimal. The limited utilization, according to Wambau-Kamau (2012), is due to the high cost of the software packages, which restricts access to instructors and students. In a separate study, Adwoa-Oppong et al. (2013) discovered that the clothing and textiles departments in Ghanaian universities and colleges face challenges such as a lack of computers and a lack of funds to purchase the necessary software packages. This means that, despite the fact that the majority of this software is available on the market, most institutions are unable to purchase it. Finding out what ICT resources are available in Ghanaian institutions of education is crucial because it will reveal whether these colleges have enough of these ICT resources for teaching and learning about clothes and textiles.

The availability of ICT infrastructure and resources in schools is a prerequisite for ICT integration in education (Japhet & Usman, 2018). The availability and accessibility of ICT resources, such as hardware and software, is critical for effective adoption and integration of ICT into teaching in schools. As a result, having access to computers, updated software, and hardware is critical to successful technology adoption and integration. Teachers will not use ICT resources if they cannot access them. As a result, teachers in schools must have access to hardware, software, and network infrastructure. Per a study conducted by Wastiau and Pagano (2013) on the effect of teachers on the use of ICTs in the classroom, a smaller proportion of teachers work in classrooms with high access to ICTs. According to a comparable survey done by the European Commission (2013), the most significant barrier to teachers' use of ICT in the classroom is access to ICT. Access to technology resources does not only refer to the availability of tools and programs, but also to their suitability for supporting teaching and learning (Tondeur, Valcke, & van Braak, 2008). Teachers with the required technological resources are more inclined to include ICT into their classroom activities (Japhet & Usman, 2018).

Technology can be utilized to help and enhance learning in a variety of ways. In classrooms, everything from video content and digital moviemaking to laptop computers and mobile devices has been employed. Similarly, new technological applications, such as podcasting, are continually being developed (Anshari, Almunawar, Shahrill, Wicaksono, & Huda, 2017).

In the teaching and learning of clothing and textiles, such software applications are necessary to accomplish tasks and activities required at various phases of the design process, such as conceptual design, design document preparation, and cost estimates. However, in many Ghanaian schools and institutions, these software packages are not widely available for teaching and learning (Adwoa-Oppong et.al, 2013). Not only does the availability of the software for the teaching of clothing and textiles affects the effective integration of ICT by the clothing and textiles teachers but they may be other factors that hinder the effective utilization of ICT tools in such fields. Previous studies have looked at the impact of ICT in teaching and learning, factors affecting the use of ICT at the primary, secondary and universities with less attention at the Colleges of education especially in relation to the teaching of clothing and textiles. In addition, there have been the assessment of ICT integration in the other subject areas with less attention on clothing and textiles instruction as well as factors that hinder the integration of ICT tools in clothing and textiles instruction. The problem is if these factors are identified, a solution can be provided by various stakeholders so as to enhance effective integration of ICT in the teaching and learning of clothing and textiles. As a results, the current study seeks to contribute to literature by examining the challenges of using ICTs in teaching and learning of clothing and textiles in the Colleges of Education in Ghana.

## **Purpose**

The purpose of this study is to identify the challenges that tutors and student teachers at Colleges of Education encounter in using ICTs in learning and teaching of clothing and textiles.

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## METHODOLOGY

The current study employed concurrent triangulation research design under mixed method approach for the study (Creswell & Plano Clark, 2018). This is because the researcher sought to validate the findings generated by quantitative data through evidence produced by the qualitative data (Creswell & Plano Clark, 2018). The study used QUANT + qual because the researcher seeks to supplement the quantitative data with the qualitative data in order to get in-depth understanding of the challenges in the integration of ICT in the teaching and learning of clothing and textiles. The population of the study consisted of two hundred and thirty (230) of level 200 and level 300 student teachers offering clothing and textile and all 8 tutors teaching clothing and textiles in the four selected Colleges of Education. The population was made up of fifty-seven (57) student teachers for college A (27 levels 200 and 30 level 300). Sixty (60) student teachers from college B (30 levels 200 and 30 level 300). Fifty-six (56) student teachers also from college C (28 levels 200 and 28 level 300) and fifty-seven (57) student teachers from college D (30 levels 200 and 27 level 300). A total of 8 tutors; two from each of the selected colleges also constituted the tutor's population. The names of all the colleges within the CENTWEST zone were collected from the zonal office. Out of the seven colleges within the zone, the researcher used purposive sampling technique to select all the four colleges within the zone offering clothing and textiles as an elective course. The purposive sampling was used because some of the colleges do not offer clothing and textiles as an elective course. The sample of the study was made up of 120 level 200 and 300 student teachers who were purposively selected from the four colleges of education within the CENTWEST zonal Colleges of Education. Thirty student teachers were selected from each college and 15 within each level because 15 out of the total student teacher population at each level represent more than 50% of the total student teacher's population of each level in the selected colleges. This therefore makes the sample a true representation of the population. The researcher calculated the sample size using Krejcie and Morgan's table, which found that the sample size was 120. In the qualitative phase, simple random sampling was used to select four (4) student teachers from each of the four colleges while purposive sampling was used to select all the teachers teaching clothing and textiles in the four colleges of education in the CENTWEST zone of Ghana. This make a total sample of students' teachers to be sixteen (16) and the eight teachers for the qualitative phase. A questionnaire was used to collect quantitative data from both the teachers and the student teachers. The items were designed based on the previous research studies. The questionnaire was validated by six (6) clothing and textiles teachers. To ensure the reliability of the questionnaire, the items were pilot tested with 75 student teachers and three teachers in the Wesley College of Education in the Ashanti region of Ghana. The reliability index of the questionnaire was 0.86. In the qualitative phase, a semi-structured interview was used to collect the data for the study. Prior to the data collection, the researcher sought permission from the principals, head of clothing and textile department, head of academics and the teachers in the selected colleges of education teaching clothing and textiles. Also, a consent letters were given to the student teachers and the teachers to sign so as sought their concern before the data collection. A one-to-one interview strategy was used to interview both the students' teachers and the teachers of clothing and textiles. Each of the participants used 7 to 10 minutes to complete the questionnaire in the presence of the researcher. This helps the researcher to clarify issues in the questionnaire and to get all sets of the questionnaire. Each of the interview lasted between 10 to 12 minutes. The quantitative data were analysed using descriptive statistics such as descriptive statistics such as means and standard deviations as well as coefficient of variations. The qualitative data was analysed using thematic analysis.

## RESULTS AND DISCUSSION

In order to find out the challenges faced by tutors and student-teachers in using ICT resources for learning and teaching of clothing and textiles, tutors and student teachers were given 10 items on a 5-point Likert scale to respond. The scale was interpreted as 5= strongly agree, 4= Agree, 3 = Uncertain, 2= Disagree and 1= strongly Disagree. The results of the respondents are shown in the Table 4.5.

Table 1: Response of Student Teachers on Challenges they encounter on Using ICTs for Learning Clothing and Textiles

Statement	Mean	SD
Insufficient number of computers in the college laboratory	3.6	0.49
Insufficient internets access in the college	3.25	0.46
Personal ICT resources are not allowed by student- teachers	1.50	0.52
Lack of adequate skills of tutors	1.20	0.46
Most tutors are not in favor of using ICTs in the college	1.40	0.48
Insufficient power supply	1.50	0.47
There is not enough time for student teachers to use ICT resources for clothing and Textiles practical	3.00	0.38
The ICT technician is not always available at the college ICT laboratory	3.70	0.37
There are always clothing and textiles software problems	3.60	0.47

Number of Respondent (N) = 120, (Field work, 2023)

From Table 1, the major challenges encountered by student teachers in using ICT resources for learning clothing and textiles include in the colleges of education within the western and central zone include insufficient number of hardware resources such as computers, projectors, printers and smartphones (mean = 3.6, SD = 0.49). These ICT resources are not adequate in the colleges, and this always hinder effective integration of ICT resources into their learning of clothing and textiles. Insufficient internet access is also one of the major challenges militating against effective integration of ICT resources in learning clothing and textiles in their respective colleges (mean = 3.25, SD = 0.46). Due to insufficient internet access, student-teachers are unable to visit education sites to download videos, files and other documents that can help them in their learning of clothing and textiles. Lack of enough time for student-teachers to practice with ICT resources in clothing and textiles was also identified as another challenge faced by student teachers in using ICT resources for learning clothing and textiles (mean = 3.00, SD = 0.38). Since the timetable is choked and student-teachers have other lectures to attend throughout the week, they are unable to visit the college multimedia center to use these ICT resources to learn clothing and textiles. These challenges identified must be address as early as possible so as to help ensure effective ICT resources integration into the teaching and learning of clothing and textiles. Moreover, the students’ teachers also indicated that the technician is not always available at the college ICT laboratory (mean = 3.70, SD = 0.37) even if they wish to practice some lessons on their own. This implies that students’ access to the computer laboratory is limited and even if they encounter any technical problem, the technician to help them solve becomes an issue. Another challenge student-teachers encounter in learning clothing and textiles with ICT resources in the colleges is lack of clothing and textiles software (mean = 3.60, SD = 0.47). Since there is no clothing and textile software on any of the computers in the ICT laboratory, student-teachers are unable to use them for their practical work. Tutors teaching the course also lack this software hence their inability to use them with students during practical work. Since teaching and learning are done be both teacher and students. It is useful to ascertain the view of the teachers with respect of the challenges in using ICTs for the teaching of clothing and textiles. The results is shown in Table 2

Table 2: Response of Tutors on Challenges they encounter in using ICTs for Teaching Clothing and Textiles

Statement	Mean	SD
Insufficient number of computers in the college laboratory	3.75	0.48
Insufficient internets access in the college	3.50	0.48

Insufficient power supply	1.46	0.49
Fixed lesson time for using ICTs to teach clothing and textiles	1.30	0.34
Absence of ICT technicians to assist in college ICT laboratory	1.00	0.00
Absence of ICT technicians in the college to fix ICT problems	1.75	0.49
Absent of Software to help Clothing and textile lessons	4.37	0.34
Absence of system for monitoring and evaluating ICTs enhancement in the college	4.68	0.54
Absence of CAD to design curves in 2D/3D	4.48	0.54
Insufficient knowledge of ICTs in clothing and textiles	1.37	0.53

Number of Respondent (N) = 120, (Field work, 2023)

Table 2 show the challenges teachers encounter in using ICT for teaching clothing and textiles. According to Table 2, the main challenges faced by clothing and textiles teaching in teaching using ICT are: insufficient number of computers in the college laboratory (mean = 3.75, SD= 0.48), insufficient internets access in the college (mean =3.50, SD = 0.48) , absent of Software to help clothing and textile lessons ( mean =4.37, SD = 0.34) , absence of system for monitoring and evaluating ICTs enhancement in the college ( mean = 4.68, SD = 0.54) and absence of CAD to design curves in 2D/3D ( mean = 4.48, SD = 0.54). Insufficient computers pose a problem to the teachers when teaching the aspect of the content that requires that every learner designing of things using the computer. Since the computers are not up to the number, the teachers may be forced to group the students’ teachers to share a common computer and as such finds it difficult to monitor the progress of individual students’ performance especially with practical activity. The absence of the software for the teaching could be because of the teachers not having knowledge on the availability of software for the teaching of clothing and textiles to recommend to the school to purchase. It could also be that the schools have not been able to acquire that software due to financial problem or lack of knowledge on the presence of those software. The absence of system of monitoring and evaluating ICTs enhancement in the colleges of education could discourage the teachers from using ICT in their lessons despites it positive effects on clothing and textiles instructions.

## DISCUSSION OF THE RESULTS

Challenges that tutor and student-teachers encounter in using ICT resources were investigated. The result reveal that both student- teachers and tutors agreed to the fact that colleges of education in the CENTWEST zone have insufficient number of computers in their respective colleges for Learning and Teaching clothing and textiles. This also means that most student teachers are not able to get access to computers and other hardware resources due to their shortage in the colleges. This has affected student teachers in doing effective research to broaden their horizon in the field of clothing and textiles. This might be that the colleges are not having enough funds to purchase more computers to help effective teaching and learning. Tutor during the interview section review that not only computers are insufficient in the college but other hardware resources such as projectors, printers, and laptops are all not sufficient in the colleges. Some of the views of the tutors are as follows:

*“Because there is only one projector and it is occasionally being used by another tutor in a different classroom, when I am required to utilize a projector at all times to ensure effective teaching, it becomes extremely difficult for me. I am therefore required to employ the standard traditional technique of teaching in such circumstances.”* (Tutor #2 from college A).

Another tutor said:

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*“Our college has computer labs, but the labs are just names because the equipment is subpar and we frequently have trouble using the second-hand equipment we have. Colleges like our own are meant to have constant internet access, yet we have a situation where we can go a whole semester without it, making it hard to utilize ICTs in the classroom. (Tutor #4 from college B).*

Some students also shared their views on the challenges they encounter in using ICT tools for learning clothing and textiles. Some of the extracts include:

*Student 13 (from college D): “because we are many, you sometimes don’t get access to computers in the ICT lab. we have to use our phones and if you don’t have one, then thus all”*

*Student 11 (from college C): “sometimes there is no projector for us. You will go to the ICT lab for projector, and nothing is there. We are unable to watch important videos and pictures.*

All these responses from tutors indicate that computers and its associate hardware are insufficient in the colleges of education in the western and central zone. This, however, affects how tutors integrate ICT resources into their learning and teaching especially for clothing and textiles. This finding supports Pelgrum (2001), who investigated tutors' use of ICTs in 26 countries to determine the major challenges to integrating ICTs in colleges. Pelgrum concluded that two of the ten major obstacles were a lack of computers relative to the number of students and a lack of ICT resources. They simply find it very challenging to use ICTs as a regular teaching strategy in the classrooms for clothing and textiles. Nkonki, Chipu, & Nsubuga, 2016).

Another challenge the study revealed as affecting effective teaching and learning clothing and textiles in the colleges was insufficient internet accessibility. This might be due to the geographical location of this part of the country which does not support strong internet accessibility. The colleges are also not having enough money to purchase high routers that will support high internet connectivity. When tutors were interviewed on these issues, their responses also affirmed that fact that internet accessibility is a big problem in their colleges, and this highly affect their integration of ICT resources into their teaching and learning. Some extracts of their responses are shown below:

*Poor connections, and internet fluctuations are big problems here. You need to go to town where you can get internet before you can download some videos and others you need for your lessons. The internet connection in our college is not strong. (Tutor #7 from college B).*

Another Tutor said

*“Where our college is located is not helping us at all. It is very difficult to get internet accessibility. You need to wake up at night before you can download their files and documents” (Tutor #5 from college C)*

Response of some student teachers during the interview were as follows

*Student 8 (from college B): “internet is not strong on campus at all. Sometimes, the WIFI doesn’t even work. They have to check it.*

*Student 2 (from college A): “they have to do something on our WIFI for us. Is too slow. Downloading things take several times.*

All these responses attest to the fact that internet connectivity is a bigger challenge in colleges in the central and western zone. This has affected how tutors and student-teachers integrate ICT resources into their teaching and learning of clothing and textiles. The government and school management must ensure that all colleges have good and fast internet in their colleges to help student-teachers and tutors with their ICT integration during their lessons and personal studies. This finding is found to support Gyamfi and Gyaase (2015) which found out providing internet connection to students in institutions or school is another barrier that affect ICT usage in schools and colleges in Ghana.

The study also found out that personal ICT resources usage and power supply are not challenges that militate ICT resources usage in the colleges of education in the CENTWEST zone. Both tutors and student-teachers are at liberty to use their personal ICT resources such as laptops, modems, smartphones, pen drives, and CD ROMs in preparing lessons, personal research, group research and doing assignments. The colleges are having stable power supply due to the stable power supply in the western and central region of the country. Apart from this, most of the colleges also have electric plants that supply them with power supply when the national power supply is off. These electric plants are able to sustain academic work at both day and night. This was confirmed by tutors and student teachers when they were asked in an interview to comment on whether personal ICT resources usage and power supply were challenges to their usage of ICTs in learning clothing and textiles. Extracts of the interview are shown below:

*Tutor (7 from college A): power supply is not an issue in this college. As you can see, we have plant which gives us power in case of light outs*

*Tutor (2 from college A): I don't even go to the ICT lab, I have my personal laptop for preparing my lesson, working on my assessments, and doing my personal research work so am able to do things even in my house without going to the ICT lab.*

*Student 10 (from college C): this place they don't give light out frequently, so we are able to charge our phones and laptops without difficulties*

*Student 14 (from college D): most of us have phones which we use for our personal research and studies. we even use the phone to type our assignments.*

This shows majority of student teachers in the colleges of education have personal ICT resources to supplement what the school is having. This finding is in line with Thornton and Houser (2005) which stated that cell phones that students carry with them today can be utilized effectively in their learning whether in school or home. This study also conforms to Goundar (2014) which also emphasized that personal phones and laptops of students also help them in using ICTs in their personal studies both in school and outside school.

Another factor that hinders the tutors' decision to integrate ICTs was the availability of time. The study also revealed that both tutors and student teachers do not have fixed time on their timetable for using ICT resources for teaching and learning clothing and textiles. This has become a big challenge especially when they want to do practical work with ICT resources. Student-teachers complained bitterly that the ICT lab is always occupied so they are unable to use the computers for their practical work. In the night where at least, they can go and do their practice, the technicians lock up the place and leave for their homes. Because of this limited time, student-teachers only do the manual practical only without the technological one. All the Tutors (100%) complained of limited access to ICT resources in the colleges due to the college timetable. All the tutors addressed the insufficient time to effectively use ICTs in the classroom. They felt that there was no time given for them to plan and integrate ICTs into the lessons since they were busy achieving the goals of the curriculum. This was confirmed in an interview section with both students- teachers and tutors when they were asked to comment on the time available for using ICT resources for teaching and learning clothing and textiles. Extract of the interview is shown below:

*"I don't have enough time to go through the lessons via the ICT resources..... "limited time is not enough to set up all those ICT resources and start the class, especially with the practical aspect. The curriculum is now based on standards both pedagogy and content are being taught together at the same time" (Tutor #3 from college B).*

*Student 4 (from college A): there is no time for us to use ICT resources to do our practical. We are always moving from one lecture to another lecture. By the time we are done for lectures and want to use the lab for our practical, the lab would be locked.*

This study confirms that of Ghavifekr, Kunjappan, Ramasamy, & Anthony (2016), who discovered that several facets of tutors' jobs leave them with insufficient time to employ ICTs in the learning and teaching process.



This covers the time required to plan their classes, the exploration and pedagogical use of ICTs in the classroom, and the insufficient time to handle technological issues. According to Ahmed, M., and Jibia, J. A. (2013), one of the primary reasons instructors don't use ICTs pedagogically in the classroom is that there isn't enough time to carry out the pedagogical plan. ICT-enhanced lesson preparation takes a lot of time since, on average, it takes three to four hours to prepare an hour of content, according to Albirini (2006). As a result, the tutors had trouble either planning the sessions or teaching them in a short amount of time. The tutors also require extra time to put up all the ICT equipment in the lecture spaces. The tutors believed that they could complete the necessary tasks during class time rather than putting together ICT materials, about which they knew little. The lack of preparation time in courses and on instructors' own schedules, according to Balanskat, Blamire and Kefala (2006), is one of the major obstacles to their use of computers.

The study also brought to light the unavailability of laboratory technicians in the college laboratory as another challenge that hinder student- teachers from using ICT resources for teaching and learning clothing and textiles. According to student-teachers, the ICT lab is mostly locked so they are not able to use the place at their leisure times for their practical work. The day that the place will be open too, you may not meet any technician to assist you in your practical work at that time since the tutor may not be available at that time. This was revealed during the interview section when students' teachers were asked whether ICT technicians are not always available at the college ICT laboratory. Some responses of student-teachers are shown below:

*The place is always locked, when it gets open, you don't see anyone one there to report your issues to. I think the technicians don't come to the laboratory regularly. (Student #4 from college B).*

However, most of the tutors disagree with student teachers on the fact that ICT technicians are not available at the college laboratory. The tutors are of the view that the technicians are always available at the laboratory when there is lesson and whenever their help is being needed. They only stay away when there is nothing going on at the laboratory. Some tutors share their views in an interview on whether ICT technicians in the college are always present in the laboratory to assist student teachers in their lessons.

*Tutor1(from college A): the ICT technicians are always available to help us anytime we need assistance in the laboratory and even when we call them on any difficulties, they always respond and help us.*

This might be that the college has employed enough ICT technicians who assist tutors and student-teachers in fixing projectors, storing information of drives and helping student-teachers to assess portals and sites for their research work. These ICT technicians are always present in the college to provide the needed ICT assistance to tutors and student-teachers. This has help to reduce the burden on tutors looking for and fixing projectors which is tedious for them sometimes. Due to this, most tutors are ever ready to integrate ICTs into their teaching.

Another challenge identified to be militating against effective ICT resources usage in teaching and learning of clothing and textiles by both tutors and student-teachers in the colleges of education is the absent of Clothing and Textile software in the colleges. The student teachers revealed that they have heard only the names of clothing and textile software, but they have not seen or use any of the software in clothing and textiles before as part of their training. This might be that the colleges are not having enough funds to purchase this software for both tutors and students to use in the course. Tutors are therefore unable to use this software to teach student-teachers pattern designs and cutting. This has resulted in tutors using the traditional way of teaching instead of using ICT resources in their lessons. Most of the colleges also lack funds which can enable them to buy some of these expensive software for teaching clothing and textiles. During the interview section, student-teachers revealed that their tutors told them that the software is very expensive, and the colleges cannot afford to buy them and even if they buy them, they can't use them since they require large amount of data to operate them. Some extract from student-teachers is shown below:

*I have not seen or use any clothing and textile software before, they only tell us they are there, but we have not seen some before. (Student #4 from college A)*

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Another student teacher

*We don't have any software in this college, we do manual practical during practical section. We are not using ICT resources to cut or design anything. We always do our normal free hand cutting and design. (Student #16 from college D).*

This finding conforms to that of by Adwoa-Oppong et. al., (2013) which stated that in many Ghanaian universities and institutions, these ICT software packages are not widely available for teaching and learning clothing and textiles due to the high cost of purchasing them.

Another challenge student-teachers identified with laboratory technicians was lack of knowledge content in clothing and textiles stuffs. This means that the technicians have not studied clothing and textiles before, so they are not able to help student-teachers in clothing and textiles specific contents. They don't know how to use any software in the clothing and textiles and how to use them in cutting and designing. This means that their presence in the laboratory is sometimes not felt since they are not able to provide content guidance to them during lessons.

The study also found out that insufficient knowledge in ICTs by clothing and textile tutors is not a challenge for tutors using ICT resources in their teaching and learning. This might be that majority of the tutors teaching clothing and textiles have received enough training on how to integrate ICTs into teaching and learning hence it is not a challenge for them to use it during their lessons. This study looked into the skills and competencies of tutors and student teachers as well as their understanding of how to use ICTs. We asked the instructors to discuss the type of ICT-related training they undertook in their course area in order to understand why some of the tutors were actively using ICT resources in their lecture rooms while others were using it indirectly. It was evident from their comments that the majority of the tutors had only received pre-service and in-service training in the fundamentals of using ICT resources. Additionally, the majority of instructors who are actively using the tools said that they developed their abilities and expertise in using them by personal efforts they made outside of work hours for their own personal development. Others acknowledged that they lacked the knowledge necessary to integrate ICTs into their subject. This evident from some of their statements:

*"After my training as a tutor seminar are being organized every year by resource persons to train tutors on the use of ICTs in their teaching. These courses are specifically designed for instructors of ICT courses. In general, further seminars are being planned to teach tutors the fundamentals of computers. However, these workshops typically do not assist instructors in incorporating ICTs into their range of courses. (Tutor #4 from college B).*

Another tutor said:

*"First of all, our program and curriculum are practical oriented, and we do not normally use ICT resources. You know we go for seminars, but I have not yet attended a seminar where we are taught how to integrate ICTs in clothing and textile lessons. Most of the symposium I have attended, tutors were just trained on some basic computer skills". (Tutor #6 from college C)*

In contrast, several instructors express their delight with the seminars but stress that they help them advance their technological expertise rather than their ability to use the tools to teach their courses, as one tutor noted:

*"I recently participated in a nongovernmental organization's in-service training program. After receiving all of this training, I developed flexibility in my web browsing and research techniques. Therefore, I believe that my current internet skills are a result of my training. ". (Tutor #7 from college D)*

The tutors acknowledged that the seminars did not benefit them in their subject areas, making it impossible for them to utilize the tools in the lecture halls practically even when given the chance. As a result, they acknowledged that they lacked the knowledge necessary to properly utilize ICT tools in their lecture hall. A few of the tutors who could use the tools in the teaching and learning process acknowledged that the majority

of what they knew resulted from their enthusiasm for the ICT resources and their capacity to collaborate with other ICT capable tutors. One of the tutors observed:

*“I have learned much of what I know on my own, but occasionally I have sought assistance from colleagues who have a stronger interest in information and communications technology, like the ICT tutors.”* (Tutor #2 from college A)

It was clear from the comments that many of the tutors mentioned prior training and current ICT training provided by resource persons. Most tutors were not actually employing these technologies in their lecture halls because this training did not provide them with the information necessary to use them in the learning and teaching process. This is one of the reasons why teaching personnel still find the idea of integrating ICT resources to be challenging.

Without taking student teachers' skills and expertise in the pedagogical use of ICTs into consideration, tutors' knowledge and abilities would not be of much use to the process of integrating ICTs in learning and teaching. After the interview, tutors were questioned on whether or not their student teachers possess the abilities to use ICTs effectively in the classroom. Some of the tutors who were more skilled at utilizing these tools in the teaching and learning process state that there were instances when it was impossible to use certain tools because some of the student teachers lacked sufficient knowledge on how to use them. The tutor acknowledged that some of the student-teachers come from different backgrounds, which limits the use of the technologies in their lecture halls. All of the tutors concurred that:

*“The student teachers come from various backgrounds, some of which make it difficult for them to own smartphones or personal computers. Although I have a ton of learning software on my laptop, I am unable to share it with them because most of them won't comprehend how it operates.”* (Tutor #8 from college D)

Most of the tutors admitted that they lacked the expertise necessary to effectively employ ICTs in their lecture rooms as a teaching tool.

Mishra and Koelher (2006) made the distinction between understanding how to utilize technology and knowing how to use it to teach. They argued that acquiring new ICT abilities alone is insufficient to have a thorough knowledge of how to apply them in lecture halls. Despite efforts made to include ICTs into teaching, it was clear from the results that most of the tutors lacked knowledge of how to do so in a pedagogical manner. ICT-based activities were not thoroughly considered for specific subjects and aims, as was clear during study-related observation. Instead, ICTs were applied in a way that was superficial and without a true purpose, as explained by Singh and Chan (2014). Preparing instructors to use ICTs pedagogically more frequently and effectively becomes a difficult endeavor. Many educational institutions throughout the world only give rudimentary ICT training to both pre-service and in-service tutors, they equip them to use ICTs in evaluating their student teachers and for some type of administrative function, Because of this, there is still a serious issue with the use of ICTs in education (Mfaume, 2019).

It was also fascinating to see that although tutors admitted to owning personal computers, they were still at ease using the conventional instructional approach of teaching. It did not alter how they teach their lessons as a result. In a similar vein, Arkorful, Barfi, and Aboagye (2021) came to the conclusion that teachers who lack pedagogical expertise in the use of ICT feel apprehensive about doing so in front of their pupils.

Interview data analysis showed that in-service training was insufficient to adequately provide tutors with the methodological framework needed to properly integrate ICTs into the learning and teaching process. The training provided to tutors mostly focused on basic skills, including teaching them how to use ICT resources.

The inefficient integration of ICTs in these colleges was caused by a lack of in-service training for tutors to incorporate ICTs in their course work and a lack of enthusiasm on the part of most tutors to attend these seminars. The results of this study are consistent with Kennah's (2016) review of in-service ICT programs for Cameroonian teachers, in which he found that only 1.2 percent of teachers had received in-service ICT training on the use of ICT and that more than 60% of the training skills acquired are primarily based on technological

knowledge. According to Ghavifekr, Kunjappan, Ramasamy, and Anthony (2016), pedagogical concerns should be the focus of teacher training if instructors are to be convinced of the value of ICTs in their instruction. Unfortunately, there weren't many opportunities for ICTs in-service training each semester. Tutors claimed that they had little time to incorporate ICT skills into clothing and textiles as a result.

According to Mukuna's (2013) review, traditional in-service teacher training workshops that involve instruction in word processing, spreadsheets, and basic operating systems have acted as a barrier to the effective pedagogical use of ICTs. A more recent study conducted in Norway discovered that the lack of in-service ICT training programs was the primary issue with the educational use of ICTs (Rana & Rana, 2020). For tutors to get expertise working with new and cutting-edge ICT resources in various pedagogical techniques, colleges must offer training courses. It is clear from the tutors' comments that they all believe that professional development programs should be given greater time.

## CONCLUSION AND RECOMMENDATIONS

From the evidence gathered by this study, participants view ICT as a crucial tool in terms of learning and teaching of clothing and textiles. However, based on the key findings, it could be concluded that over half of participants indicated that ICTs integration into learning and teaching are challenge due to unavailability of software and inadequate access to internet in most of the Colleges of Education. The government, Principals, NGOs, and other stakeholders of the education should consider providing variety of Information and Communication Technologies or resources proportionally to all Colleges of Education to encourage more effective learning and teaching. Universities and Colleges of Education should think about including software in courses that cover practical methods of integrating ICTs in the learning and teaching of a variety of subjects especially in TVET. This will give student teachers the skills they need to successfully integrate ICTs in their lessons once they have completed their training.

## REFERENCES

1. Aderogba, A. A. (2012). The use of information and communication technology for qualitative science education in Nigeria secondary schools. *Ikene Journal of Education*, (2)2: 8-15.
2. Adwoa-Oppong, J., Biney-Aidoo, V., & Antiaye, E. (2013). Evaluating the Benefits of Computer Aided-Design (CAD) in Fashion Education: The Case of Accra Polytechnic. *Journal of Education and Practice*: 4(21),73-90.
3. Ahmed, M., & Jibia, J. A. (2013). Application of Information Communication Technology (ICT) and Record Keeping in Schools. *International Journal of Innovative Research and Development*, 2(1), 300-309.
4. Albirini, A. A. (2006). Teacher's attitudes towards information and communication technology: the case of Syrian EFL teacher. *Journal of Computers and Education*, 4(7) page 373-398.
5. Anshari, M., Almunawar, M. N., Shahrill, M., Wicaksono, D. K., & Huda, M. (2017). Smartphones usage in the classrooms: Learning aid or interference?. *Education and Information technologies*, 22, 3063-3079.
6. Arkorful, V., Barfi, K. A., & Aboagye, I. K. (2021). Integration of information and communication technology in teaching: Initial perspectives of senior high school teachers in Ghana. *Education and Information Technologies*, 26, 3771-3787.
7. Asad, M. M., Hussain, N., Wadho, M., Khand, Z. H., & Churi, P. P. (2021). Integration of e-learning technologies for interactive teaching and learning process: an empirical study on higher education institutes of Pakistan. *Journal of Applied Research in Higher Education*, 13(3), 649-663.
8. Asamoah, M. K. (2021). Sturdiness and scuffle in deploying educational technologies for teaching and learning in a low-technology context: Students' experience in a developing society. *African Journal of Science, Technology, Innovation and Development*, 13(2), 167-184.
9. Audí, N. M., Puig, M. A., & Fonseca-Escudero, D. (2016). Active Learning using Digital Technology and Ubiquitous Information in Architectural Construction: PBL as a Vital Methodology for Instructional Design. In *Handbook of Research on Applied E-Learning in Engineering and Architecture Education* (pp. 338-367). IGI Global.

10. Balanskat, A. Blamire, R. & Kefala, S. (2006). The ICT Impact Report. A review of studies of ICT impact on schools in Europe. EuropeanSchoolnet: [http://ec.europa.eu/education/pdf/doc254\\_en.pdf](http://ec.europa.eu/education/pdf/doc254_en.pdf).
11. Becta. (2004). A review of the research literature on barriers to the uptake of ICT by teachers. Coventry UK: British Educational Communications and Technology Agency.
12. Chipo, D., Nsubuga, D., & Nkonki, D. (2016). The Implementation of Information and Communication Technology (ICT) Intergrated Teaching and Learning in Textiles and Clothing Programmes at One University of Science and Techology in Zimbabwe (Doctoral dissertation, University of Fort Hare).
13. Cipolla Ficarra, F. V. (Ed.). (2022). Assessment Methods and Success Factors for Digital Education and New Media. IGI Global.
14. Creswell, J. W., & Plano Clark, V.L. (2018). Research Design (5<sup>th</sup> edition). Sage Publications, Los Angeles.
15. Forster, P., Quarcoo, R., Ashong, E. L., & Ghanney, V. (2017). Views of Teacher-Trainees on Clothing and Textiles Education in Two Teacher Education Universities in Ghana. *World Journal of Education*, 7(1), 1-13.
16. Ghavifekr, S., Kunjappan, T., Ramasamy, L., & Anthony, A. (2016). Teaching and Learning with ICT Tools: Issues and Challenges from Teachers' Perceptions. *Malaysian Online Journal of Educational Technology*, 4(2), 38-57.
17. Ghavifekr, S., Kunjappan, T., Ramasamy, L., & Anthony, A. (2016). Teaching and Learning with ICT Tools: Issues and Challenges from Teachers' Perceptions. *Malaysian Online Journal of Educational Technology*, 4(2), 38-57.
18. Goundar, S. (2014). The distraction of technology in the classroom. *Journal of Education & Human Development*, 3(1), 211-229.
19. Gyamfi, S. A., & Gyaase, P. O. (2015). Students' perception of blended learning environment: A case study of the university of education, Winneba, Kumasi-campus, Ghana. *International Journal of Education and Development using Information and Communication Technology*, 11(1), 80-96.
20. Hennessy, S., Ruthven, K., & Brindley, S. (2005). Teacher perspectives on integrating ICT into subject teaching: commitment, constraints, caution, and change. *Journal of curriculum studies*, 37(2), 155-192.
21. Japhet, E. L., & Usman A. T. (2018). Factors that influence teachers' adoption and integration of ICT in teaching/learning process. *Educational Media International*, 55(1), 79-105.
22. Jeong, H., & Hmelo-Silver, C. E. (2016). Seven affordances of computer-supported collaborative learning: How to support collaborative learning? How can technologies help?. *Educational Psychologist*, 51(2), 247-265.
23. Jhanji, Y. (2018). Computer-aided design—garment designing and patternmaking. In *Automation in garment manufacturing* (pp. 253-290). Woodhead Publishing.
24. Jonson, B. (2005). Design ideation: the conceptual sketch in the digital age. *Design studies*, 26(6), 613-624.
25. Kennah, M. (2016). The use of ICT in the teaching and learning process in secondary schools: a case study of two Cameroonian schools.
26. Kessler, G. (2018). Technology and the future of language teaching. *Foreign language annals*, 51(1), 205-218.
27. Matsiola, M., Spiliopoulos, P., Kotsakis, R., Nicolaou, C., & Podara, A. (2019). Technology-enhanced learning in audiovisual education: The case of radio journalism course design. *Education sciences*, 9(1), 62.
28. Mfaume, H. (2019). Awareness and Use of a Mobile Phone as a Potential Pedagogical Tool among Secondary School Teachers in Tanzania. *International Journal of Education and Development using Information and Communication Technology*, 15(2), 154-170.
29. Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, 108(6), 1017-1054.
30. Mok, P. Y., Xu, J., Wang, X. X., Fan, J. T., Kwok, Y. L., & Xin, J. H. (2013). An IGA-based design support system for realistic and practical fashion designs. *Computer-Aided Design*, 45(11), 1442-1458.
31. Mukuna, T. E. (2013). Integration of ICT into teacher training and professional development in Kenya. *Makerere journal of higher education*, 5(1), 3-21.
32. Oppong, J. A., Biney-Aidoo, V., & Antiaye, E. (2013). Evaluating the benefits of computer aided design (CAD) in fashion education, the case of Accra polytechnic. *Journal of Education and*

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- Practice, 4(21), 1-10.
33. Papanastasiou, G., Drigas, A., Skianis, C., Lytras, M., & Papanastasiou, E. (2018). Patient-centric ICTs based healthcare for students with learning, physical and/or sensory disabilities. *Telematics and Informatics*, 35(4), 654-664.
  34. Park, J.H., & Lee, H.J. (2011). Computer Aided Technical Design. *Journal of Textile and Apparel, Technology and Management*, 7(1), 609-622.
  35. Pelgrum, W. J. (2001). Obstacles to the integration of ICT in education: Results from a worldwide educational assessment. *Computers and Education*, 37(2), 163–178.
  36. Quarshie, S. (2015). Factors affecting teachers' use of information and communications technology: A review of the literature. *Journal of Information Technology for Teacher Education*, 9(3), 319–342.
  37. Rahimi, M., & Karkami, F. H. (2015). The Role of Teachers' Classroom Discipline in Their Teaching Effectiveness and Students' Language Learning Motivation and Achievement: A Path Method. *Iranian Journal of Language Teaching Research*, 3(1), 57-82.
  38. Rana, K., & Rana, K. (2020). ICT Integration in Teaching and Learning Activities in Higher Education: A Case Study of Nepal's Teacher Education. *Malaysian Online Journal of Educational Technology*, 8(1), 36-47.
  39. Salihi, A. M. (2015). The use of ICT in science education. *Glob Educ Res J*, 3(2), 258-264.
  40. Singh, T. K. R., & Chan, S. (2014). Teacher readiness on ICT integration in teaching-learning: A Malaysian case study. *International Journal of Asian Social Science*, 4(7), 874-885.
  41. Špelic, I. (2020). The current status on 3D scanning and CAD/CAM applications in textile research. *International Journal of Clothing Science and Technology*, 32(6), 891-907.
  42. Thornton, P., & Houser, C. (2005). Using mobile phones in English education in Japan. *Journal of computer assisted learning*, 21(3), 217-228.
  43. Wambau-Kamau, V. (2012). Assessment of the adoption of apparel computer aided design technology training in selected public universities in Kenya. Master thesis: Kenyatta University.
  44. Wastiau, P. & Pagano, P. (2013). The teacher effect on the use of ICT in the classroom. *European Schoolnet*, 1, 1-4.
  45. Yazıcıoğlu, D. A. (2011). The integration of interior architecture education with digital design approaches. *US-China Education Review*, 8(5), 637-658.