

The integration of Information and Communication Technologies (ICT) in the teaching of fashion and fabrics

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Abstract

Fashion and fabrics (FF) currently rely on traditional teaching methods, yet there is a clear need and significant potential to explore ICT integration within the curriculum. This study investigated the readiness, attitudes, and knowledge of FF teachers regarding ICT integration. Employing a pragmatist paradigm, a sequential exploratory design was adopted. The sample comprised all FF teachers (N = 54) in the Hhohho region while qualitative data was gathered through convenience sampling (N = 15). The findings revealed that teachers generally possess a positive attitude towards ICT integration and are competent in basic computer skills. They recognize ICT's potential to engage students, improve learning, and reduce workload. However, teachers lack proficiency in fashion computer-aided design (CAD) software. Furthermore, teacher readiness to use ICT varied significantly across age groups, with teachers aged 40-49 years showing slightly less readiness compared to other age groups. The study highlights the need for specialized training and improved access to technology to facilitate effective ICT integration in Fashion and Fabrics education. It is recommended that government should develop and implement targeted training programs to enhance teacher proficiency in using ICT for educational purposes; allocate necessary resources, including computers, projectors, and internet access, to schools to facilitate the effective implementation of ICT in classrooms.

Keywords: ICT, fashion and fabrics, integration, teachers' preparedness, change

Introduction

Fashion and Fabrics (FF), also known as clothing and textiles, has a long-standing presence in secondary education. As Nkwodimmah and Okoh (2010) noted, ambitious programs in this field emerged in many home economics schools in the early twentieth century. Given Eswatini's current high youth unemployment rate, as outlined by UNICEF (2020), the emphasis on practical skills, such as those offered through FF, becomes even more crucial. The value of these practical skills is further amplified when combined with information and communication Technologies (ICT) proficiency. The International Labor Organization (ILO, 2020) emphasizes the critical role of ICT skills in navigating

the evolving labor market demands of the Fourth Industrial Revolution. Sumathi and Selvarathi (2020) defined ICT as a broad spectrum of technologies encompassing telecommunications, video conferencing, and computer-mediated tools. Akubue and Chukwu (2016) specifically advocated the integration of digital technologies, including the Internet, web applications, and computer networks, into clothing and textile education. This integration should move beyond basic computer use, with the aim of transforming teaching and learning. Internet resources can provide access to current industrial trends and technologies, thereby enriching the curriculum. Web applications, such as CAD software, can enhance design and pattern-making skills. Through Learning Management Systems, computer networks can facilitate interactive learning and online collaboration. Furthermore, digital tools can be used to teach industry-specific skills, such as digital textile printing and the online marketing of fashion items. By implementing these digital tools, education on clothing and textiles can become more relevant, engaging, and aligned with the demands of the modern fashion industry, effectively preparing students for future careers.

Although Eswatini's curriculum mandates ICT education in tertiary institutions, it remains an optional subject in secondary schools. Currently, the existing ICT infrastructure and curriculum primarily focuses on basic computer literacy. However, as the UNICEF (2018) emphasizes, technology integration across the curriculum is encouraged. This aligns with the findings of Madzima et al. (2012), who reported that government initiatives have equipped 70% of government schools with at least 20 computers. However, simply providing computers does not guarantee an effective ICT integration. The real challenge lies in ensuring that teachers possess pedagogical skills and subject-specific knowledge to leverage these tools for meaningful learning experiences. Beyond basic computer literacy, teachers need training to integrate digital resources into their lesson plans (Johnson et al., 2016), use educational software

relevant to fashion and fabric, and adapt their teaching methods to a technology-rich environment. This includes developing strategies for interactive learning, online collaboration, and assessing student learning in digital space. Moreover, ongoing technical support and maintenance are crucial to ensure that technology remains functional and accessible. Without this holistic approach, focusing on both infrastructure and teacher development, the potential of ICT to enhance fashion and fabric education will remain unrealized.

Information Communication Technology (ICT) has great potential to change the way teachers and students learn. It has been years since ICT was introduced into education, and studies have proved that using ICT in education has many benefits for both teachers and students. This study aimed to explore teachers' perceptions regarding the use of Information and Communication Technologies (ICT) in enhancing the teaching and learning of fashion fabrics in Eswatini. The specific objectives are:

1. To assess teachers' readiness to integrate ICT into their fashion fabric teaching practices.
2. To evaluate teachers' attitudes towards ICT use in fashion fabric education.
3. To determine teachers' knowledge and skills in utilizing fashion-specific Computer-Aided Design (CAD) software.

Literature review

The fashion industry has benefited from advancements in ICT. Zafar(2019)definesICTasthecollectiveefforttoequipcurrentand future generations with valuable knowledge and skills related to computing devices, communication tools, software applications, and underlying systems. The integration of Information and Communication Technology (ICT) into the teaching of fabrics and textiles offers a multifaceted approach to enhancing learning. ICT tools provide a dynamic platform for visual learning and

design. For instance, computer-aided Design (CAD) software allows students to manipulate fabric designs in both two and three dimensions, fostering a deeper understanding of patterns, textures, and colors. This is supported by research indicating that CAD software can be used for two-dimensional pattern design as well as three-dimensional design and manufacturing (Oppong et al., 2013). Furthermore, the accessibility of digital images and video resources broadens the exposure to diverse fabric samples, historical textiles, and manufacturing processes. Beyond visual aids, the Internet facilitates enhanced information access, enabling students to explore up-to-date industrial trends and scholarly research. Interactive learning platforms promote collaboration and engagement through simulations and online projects (Abdurahimovna et al., 2021). Additionally, ICT supports the development of practical skills through virtual simulations of sewing, pattern making, and digital fabrication technologies. However, challenges persist, including insufficient access to technology, lack of appropriate software, and the need for adequate teacher training (Nyamekye et al., 2024). As stated in a study on the challenges faced by teachers and students, insufficient number of computers, insufficient internet access, lack of software for teaching clothing and textiles, and Absence of CAD to design curves in 2D/3D are significant limitations. Moreover, ICT use in education can result in improved overall learning and teaching quality (Boateng et al., 2025). In addition, the use of computer-aided design software can assist Textile, Clothing and Design students in designing novel patterns that can help them produce unique garment designs. Addressing these limitations is crucial for fully realizing the potential of ICT in textile education.

Prior to garment construction, designers engage in a significant preproduction phase. This includes taking body measurements, drafting patterns, and manipulating them for an optimal fit. Traditionally, this process is time consuming, with limited assistance from calculators. Tabraz (2017) suggests

utilizing 21st-century technologies for body shape analysis to streamline this process. Kumar (2012) highlights the increasing adoption of computer-aided design (CAD) methods in fashion design. These technologies offer a range of benefits, from simulating textile weaves to facilitating size adjustments, ultimately enhancing the efficiency and precision of designers. ICT fosters innovation in material selection. Designers are continuously exploring new materials that challenge the traditional perceptions of fabrics. For example, corduroy denim, a technologically engineered fabric, offers superior durability compared to conventional 100% cotton denim. Therefore, it is crucial to introduce students to both the theoretical and practical aspects of these technologies at an early stage of their educational journey.

The Examination Council of Eswatini (2020) designed Form 4 and Form 5 syllabi to prepare students for the evolving needs of the nation and to ensure that they achieve internationally recognized standards upon graduation. This aligns with the observed growth of Eswatini's fashion industry, as evidenced by the increasing number of fashion designers, clothing brands, and modelling agencies reported on local media (Newspapers & social media, past years). The Eswatini Examinations Council assesses Fashion and Fabrics as part of the SGCSE exam. Weighting favours theoretical knowledge (70%) over practical coursework (30%). This finding emphasizes the importance of a strong theoretical foundation, as described by Riyad et al. (2020). Theoretical knowledge allows students to contextualize practical skills and develop a deeper understanding of design inspiration.

The integration of Information and Communication Technologies (ICT) in teaching and learning is not a standalone method, but rather a versatile medium that can accommodate various methodologies, approaches, and pedagogical philosophies (Dudeney, 2000). It is crucial to remember that technology serves as a support system for traditional

education, not as a replacement (Madzima et al., 2012). Raja and Najmonnisa (2018) emphasized the significant influence of classroom methods on student engagement and motivation in acquiring communication skills. This principle extends to the fields of fashion and fabric education. Teachers can leverage various methods, including technology, to create a stimulating and meaningful learning environment. This can be achieved by integrating interactive simulations, virtual-field trips, and collaborative online platforms. Utilizing digital tools for personalized feedback and multimedia presentations also enhances engagement, catering to diverse learning styles and fostering a deeper understanding. Raja and Najmonnisa (2018) identified several effective teaching methods in textile and clothing education, as shown in Table 1.

Table 1: Effective teaching methods in textiles and clothing

Method	Description
Demonstration	Instructors can visually demonstrate sewing techniques, fabric manipulation processes, or garment construction steps.
Guest speaker	Fashion industry professionals, textile experts, or artisans can be invited to share their knowledge and experiences with students.
Role-playing	Students can reenact real-world scenarios related to fashion design, textile production, or customer service in the fashion retail industry.
Panel or round table discussion	Experts from various fashion-related fields can participate in a group discussion to provide students with diverse perspectives on a particular topic.
Field trip or tour	Visiting a clothing manufacturing facility, textile factory, or fashion design studio can provide students with firsthand exposure to the industry.
Class discussion	Facilitating open discussions allows students to share ideas, ask questions, and engage in critical thinking about course concepts.
Student project	Independent or collaborative projects allow students to apply their knowledge and skills to design and create a fashion-related item.
Buzz session (small group discussions)	Breaking the class into small groups for short discussions can promote active participation and exchange of ideas among students.

By strategically incorporating these methods, along with technology, fashion and fabric, teachers can foster a dynamic and engaging learning experience for their students.

Methodology

This study adopted a pragmatic research paradigm that prioritizes flexibility and utilizes a mix of data collection and analysis methods that are best suited to address the research questions. A mixed-method approach was employed to overcome the limitations inherent in single-method designs (Hothersall, 2019). The phenomenological research design, as potentially employed in this study (Wilson, 2014), aims to uncover, interpret, and understand participants' lived experiences.

This study targeted Fashion and Fabrics teachers in Eswatini. Owing to the limited number of teachers in the Hhohho region, a census approach was used for quantitative data collection, ensuring that all teachers participated. For the qualitative data, 12 teachers were sampled using convenience sampling, focusing on readily accessible teachers within the region. For quantitative data, a survey questionnaire was distributed via WhatsApp to all Hhohho region Fashion and Fabrics teachers; all 54 teachers were used. For qualitative data, semi-structured interviews were conducted over the phone, lasting approximately 60 minutes each. The researcher used a call recorder to capture conversations and asked open-ended questions to gather in-depth qualitative data (Creswell & Clark, 2014). This sequential exploratory design first collected qualitative data, followed by quantitative data collection.

Cresswell and Clark (2014) discussed Guba's four criteria that qualitative researchers should consider when pursuing a trustworthy study. Credibility addresses the question of how congruent findings are with reality. The researcher established credibility by triangulating the data collection methods using both semi-structured interviews and survey questionnaires. Second, transferability was established by providing evidence that the

study's findings could be relevant to other contexts, situations, times, and populations. Therefore, the researcher meticulously described the research context and assumptions central to the study. To address the issue of dependability, the processes within this study are reported in detail. This allows future researchers to replicate this work and obtain similar results. Lastly, the researcher ensured in-depth methodological descriptions to allow for scrutiny of the integrity of the research results and used participants' direct words to establish confirmability of findings (Cohen et al., 2020).

This study employed a framework analysis to uncover recurring patterns and themes in the interview data. Framework analysis is an iterative process that involves continually revisiting the entire dataset, coded extracts under examination, and evolving analysis itself. As outlined by Cohen et al. (2020) is to identify significant or intriguing patterns (themes) within the data and leverage them to illuminate the research question. The framework analysis followed a seven-stage process: familiarization, initial code generation, cross-interview thematic pattern identification, theme review, theme definition and naming, and final report generation. For quantitative data, SPSS version 23 for Windows was used to compute means, standard deviations, and ANOVA. The results are tabulated and interpreted.

Results and discussions

Teachers readiness to use ICT when teaching fashion and fabrics.

Fashion and Fabrics teachers generally expressed positive attitudes towards ICT integration in their classrooms, as evidenced by the mean score of 4.78 (Table 2). They reported strong competency in using basic technologies like email ($\bar{x} = 5.44$), word processing ($\bar{x} = 5.28$), presentation software ($\bar{x} = 5.35$), and downloading/uploading files ($\bar{x} = 5.48$). Additionally, they indicated comfort when utilizing social media for educational

purposes ($\bar{x} = 5.13$) and adapting curriculum materials to a digital format ($\bar{x} = 4.50$). Their familiarity with integrating technology into the curriculum ($\bar{x} = 4.57$) suggests their willingness to explore this approach. The survey also revealed areas in which teachers might benefit from further support. Their responses indicated slight agreement regarding familiarity with online quizzes ($\bar{x} = 4.28$) and online discussions ($\bar{x} = 4.31$) for teaching. Similarly, there was a neutral stance regarding the ease of using the digital curriculum ($\bar{x} = 4.39$) and the effectiveness of purely online learning experiences ($\bar{x} = 4.28$). Teachers' self-reported confidence in managing student learning within a technology-enriched environment was also slightly above neutral ($\bar{x} = 4.46$). The low standard deviation ($SD = 0.53$) suggests a high degree of consistency in the teacher responses.

Table 2: Teachers' readiness to use ICT when teaching fashion and fabrics.

Teacher readiness	$\bar{x}$	Std	DE
1. I am competent in using email, gmail	5.44	0.71	A
2. I am competent in using word processing software	5.28	0.78	A
3. I am competent in using presentation software such as power point	5.35	0.93	A
4. I am able to download files from the internet and upload to my laptop	5.48	0.77	A
5. I can use social media to teach my students	5.13	0.87	A
6. I am familiar with the ways of integrating technology into the curriculum	4.57	0.23	A
7. I am familiar with designing online quizzes and use them in teaching my classes	4.28	0.44	SLA
8. I familiar with using online discussions and teaching my classes.	4.31	0.42	SLA
9. I can be able to convert the printed content and activities in the curriculum to the digital	4.5	0.35	A
10. I can manage and control students learning in a technology-enriched classroom	4.46	0.38	SLA
Overall	4.78	0.53	A

The quantitative data analysis (mean score of 4.78, Table 1) aligned with the qualitative interview findings. Teachers

expressed a willingness and positive attitude towards integrating ICT into their fashion and fabric lessons. They reported feeling competent and motivated to leverage technology in their teaching practice. This convergence between the quantitative and qualitative results strengthens the overall conclusion regarding teacher readiness for ICT integration in fashion and fabric education.

ICT engages a tech-savvy generation

The pervasiveness of technology in today's world necessitates its integration with fashion and fabric education. Children readily embrace technology from a young age using tools such as cell phones. Similarly, ICT can revolutionize learning in fashion and fabric. Technology has the potential to foster a more student-centered learning environment, a key element for keeping students engaged and abreast of global trends. The teacher survey underscores this point, with respondents emphasizing the need for ICT to maintain relevance. One respondent stated, *'We need ICT in Fashion and Fabrics to align with current trends, as technology is ubiquitous in the workplace'* (Educator 2). ICT integration offers numerous advantages to both teachers and students. The lack of a single prescribed textbook for Fashion and Fabrics can be mitigated by leveraging this technology. As Educator 3 noted, *"ICT is needed because there is limited teaching material for Fashion and Fabrics. This can motivate learners to conduct independent research."* Furthermore, Fashion and Fabrics are highly practical subjects. Mastering concepts often requires students to observe teacher demonstrations, which can be time-consuming. One student aptly highlighted the challenge: *"ICT is technology, right? I think it's needed in Fashion and Fabrics to cover the syllabus quickly. We have to draw a lot per topic, which is time-consuming. Projecting images allows students to learn from the screen while you explain"* (Educator 9).

Teachers embrace technology

Teachers should be competent in using computers or at least have basic computer skills to be ready to integrate ICT in teaching fashion and fabrics. Such skills include typing on Microsoft word, printing, researching information from the Internet, and using micro soft power points to create slides. It appears that most of the fashion and fabrics of high school teachers possess these basic skills. *“I am not that competent but I do have the basics so I wouldn’t have much of a problem in teaching,”* Educator 10 stated. Before the introduction of the ICT subject in Eswatini, most high schools had already offered computer lessons to students; however, there was no exam for this subject. Even though some schools, especially those located in rural areas, did not have this subject/sub ject/did not have computers at all, going to tertiary helped them a lot as they also got the opportunity to use computers for the first time. *“My first encounter with computers was in high school then, then tertiary and now I sometimes use it at work,”* commented Educator 11.

Teachers’ motivation

Integrating ICT in fashion and fabrics will motivate the teacher because it will make lessons more interesting for the teacher; it will improve presentation of content and make lessons more fun for the children. Usually, teachers write many notes on the board for the students to copy, so instead of doing so, the teacher will simply type her notes and print them out. During class, she will no longer write on the board, but will use the projector to project her slides. It appears that most teachers do not like writing notes on the board; hence, this new teaching method will motivate many teachers. *“It will relieve me from writing a lot of notes. In as much as the teacher is relieved so will be the learner.”* Noted Educator 7

In agreement with Educator 7, the teachers will be relieved from a lot of handwriting, such as lesson plans. *“It can make your work to be easier. Like once you start using*

laptops, you can prep only once and store it in your folder,” Commented Educator 8. Teachers will be motivated when using ICT because not only will their work be simplified *“This will allow me to get more information than I currently have, as we do not have books. I will also be able to show learners things they do not know about like the runway. Having something to show the learners will motivate me and also my computer skills will improve daily,”* Educator 3 stated.

This study explored the readiness of fashion and fabric teachers in Eswatini to integrate Information and Communication Technologies (ICT) into their teaching. The world is increasingly reliant on technology, and students today have been comfortable using tools such as cell phones from a young age. Research by Semerci and Aydin (2018) supports this, highlighting the adaptability of “Net Generations” to technology. ICT integration can address several challenges faced by fashion and fabric teachers. This study revealed that ICT allows for remote learning, a valuable tool during the COVID-19 pandemic and beyond. This aligns with Gillespie’s (2006) findings that technology facilitates access to information and encourages student interaction. The study further revealed that while teachers have basic computer skills, such as using Microsoft Word and PowerPoint, they lack specialized training in ICT integration in their subject area. This aligns with Galanouli et al. (2004) and Shah (2022), who emphasized the importance of training that equips teachers with the necessary knowledge and skills to effectively use ICT in their lessons. Teachers view ICT as a way to make their work easier and more enjoyable. The ability to edit lesson plans, share digital notes, and use instructional videos can save time and provide students with additional learning resources. This aligns with research by Cope and Ward (2002); Vrasidas and McIsaac (2001), who highlight the potential of technology to improve lesson presentation and student engagement. Fashion and fabric teachers in Eswatini were enthusiastic about integrating ICT into their teaching. However, to address these challenges and

ensure their successful implementation, training and improved access to technology are crucial.

Teachers attitudes on the Use of ICT when teaching fashion and fabrics.

Fashion and fabrics teachers were asked about their attitudes towards integrating ICT when teaching fashion and fabrics. Generally, the results presented in Table 3 indicate that teachers possess a positive attitude towards integrating ICT when teaching fashion and fabrics ($\bar{x} = 5.06$). Specifically, the teachers agree that they feel confident learning new computer skills ($\bar{x} = 5.41$); that they are aware of the great opportunities that ICT offers for effective teaching ($\bar{x} = 5.13$); that they think ICT supported teaching in FF will make learning more effective ($\bar{x} = 5.17$); that they think the use of ICT will enable the students' to be more active and engaged in the FF lessons ($\bar{x} = 4.96$); that the use of ICT will help FF teachers to improve teaching with more updated materials ($\bar{x} = 5.28$); that they think the use of ICT in teaching FF will improve their students results ($\bar{x} = 5.19$); that the use of ICT will enable them to teach anywhere ($\bar{x} = 5.24$); that the use of ICT in teaching FF will reduce their workload(e.g writing notes on the chalk board ($\bar{x} = 5.48$); that the use of ICT will attract more students to join FF ($\bar{x} = 5.00$) and that they feel confident that the school administrators will allow this method of teaching ($\bar{x} = 4.76$). The results further indicate that teachers slightly agree that they do not believe that they can teach Fashion and Fabrics effectively without the use of ICT ($\bar{x} = 4.04$). The overall standard deviation ($SD = 0.53$) indicates that there was insignificant variation in the opinions of the teachers.

Table 3: Teachers' attitudes on the use of ICT when teaching fashion and fabrics

Attitudes	$\bar{x}$	STD	DE
1. I feel confident learning new computer skills	5.41	0.83	A
2. I am aware of the great opportunities that ICT offers for effective teaching.	5.13	0.06	A
3. I think ICT supported teaching in FF will make learning more effective.	5.17	0.90	A
4. The use of ICT will enable the students' to be more active and engaged in the FF lessons.	4.96	0.91	A
5. The use of ICT will help FF teachers to improve teaching with more updated materials	5.28	0.81	A
6. I think the use of ICT in teaching FF will improve my students results	5.19	0.80	A
7. The use of ICT will enable me to teach anywhere.	5.24	0.13	A
8. The use of ICT in teaching FF will reduce my workload(e.g writing notes on the chalk board	5.48	0.84	A
9. The use of ICT will attract more students to join FF	5.00	0.08	A
10. I feel confident that the school administrators will allow this method of teaching	4.76	0.08	A
11. I do not believe that I can teach FF effectively without the use of ICT	4.04	0.44	SLA
Overall	5.06	0.53	A

Legend:	Descriptive Equivalent	(DE)
0-1.4	Strongly disagree	(SD)
1.5-2.4	Disagree	(D)
2.5- 3.4	Slightly disagree	(SLD)
3.5 - 4.4	Slightly agree	(SLA),
4.5 – 5.4	Agree	(A),
5.5 - 6	Strongly agree	(SA)

Quantitative analysis revealed a positive attitude towards incorporating ICT into fashion and fabric instruction. This finding was corroborated by qualitative interviews in which teachers expressed enthusiasm for utilizing ICT in the classroom. They specifically cited the benefits for students, including enhanced engagement and improved academic performance. Additionally, teachers reported increased confidence in their teaching and reduced workload when utilizing ICT resources.

Empowering students with ICT in fashion and fabrics

Educators hold a highly positive view of integrating ICT into fashion and fabric curricula, recognizing its potential to empower students to leverage ICT in understanding the concepts in FF. This aligns with the increasing reliance on technology in the fashion industry, encompassing all stages of garment production. By providing early exposure to these tools, educators empower students with the skill set they may need to pursue careers as fashion entrepreneurs. As Educator 10 aptly stated, *“The prevalence of technology in today’s world necessitates its early introduction, ensuring a smoother transition as students navigate their future endeavours.”* Furthermore, integrating ICT fosters independent learning by encouraging students to conduct research and complete their projects autonomously. Educator 7 reinforced this notion, highlighting the development of computer skills as a critical asset, stating, *“Technology proficiency is a sought-after skill in today’s job market. Utilizing ICT simplifies project completion and fosters overall knowledge in this domain.”*

Reducing teachers' workload

Teachers normally have a heavier workload, including curriculum planning for each term, daily lesson plan creation, in-class instruction with traditional board utilization, ongoing classwork assignment and assessment, and implementation of practical lessons at least twice weekly. Technological integration offers the potential to streamline these tasks. Educators perceive computers as essential tools for alleviating their workload and enhancing their efficiency. As Educator 5 aptly stated, *“Technology can demonstrably reduce workload. For instance, lesson plans prepared in PowerPoint presentations become reusable resources, eliminating the need for yearly repetition. With digital storage, edits can be made seamlessly for future iterations.”* Furthermore, technology transcends its role in lesson delivery by empowering educators through efficient information acquisition. Educator 7 highlights this benefit, noting, *“Technology facilitates access to information via search engines. Google can simplify complex topics and provide visual aids such as pictures and videos, enhancing comprehension for both educators and students.”*

Teachers' confidence

A teacher's confidence in teaching is lifted when she knows her content well. The use of technology to search for information and be able to deliver it to learners will make the teacher confident in class. When the teacher is confident, the learners gain trust. Students are usually quick to spot a teacher who is unsure of her content or what she is teaching, and then they suddenly lose confidence in her. Introducing ICT into fashion and fabrics will boost teachers' confidence because now she will have so much information to share in a more understandable way, for example, showing the students a video on how to make cotton fiber from a plant instead of just reading and cramming the steps. *“I will easily understand some topics and deliver information in a much simplified way,”* stated Educator 7. Another way in

which teachers' confidence will be boosted is when they use the computer often and gain more experience and skills. Teachers suggest that the more computers they use to teach, the more their skills for using computers will improve. *“The teacher will be able to use the projector because even when you do presentations elsewhere, you will be used to this thing. In that way the teacher's confidence will be boosted,”* explained Educator 3.

Teachers expressed confidence that ICT integration would equip students with valuable competencies in both the fashion industry and general computer literacy. Karami et al. (2013) emphasized the importance of equipping students with life skills, such as communication, problem-solving, and collaboration, all of which are crucial for success in the modern workplace. Therefore, early exposure to technology through fashion and fabric education could prepare students for future challenges. The study highlights a concerning trend: Fashion and Fabrics consistently have the lowest number of students taking final exams compared to other practical subjects. Data from ECESWA (2021) demonstrate this disparity, with significantly fewer fashion and fabric candidates (1366) compared to Food and Nutrition (2285) in the final year. However, the teachers believe that ICT integration can reverse this trend. Kisirkoi (2015) suggested that technology-based instruction can increase student enthusiasm, interest, and creativity, potentially leading to higher enrollment in fashion and fabric. Another motivating factor for teacher support is the potential for ICT to streamline teachers' workload. Fashion and Fabrics teachers often cite extensive content, requiring substantial note-taking and practical demonstrations for each topic. The current research indicates that effective ICT integration can alleviate this burden. Johnson et al. (2016) highlighted benefits such as access to online resources, the ability to save and revise digital lessons, and the ease of sharing materials with colleagues, all of which can significantly reduce planning and preparation time, particularly for primary school teachers.

Teachers' knowledge and skills in using fashion computer aided design software

Fashion and fabric teachers were asked about their knowledge and skills in using fashion computer aided design software. Generally, results presented in Table 4 indicate that the teachers lack knowledge and skills in using these fashion computer aided design softwares ($\bar{x} = 2.32$). Specifically, the teachers disagree that they are able to use different kinds of apps used for sketching designs like coreldraw ($\bar{x}=2.17$); that they can use computer softwares to create basic block patterns like (adobe illustrator) ($\bar{x} = 2.26$); that they can use the computer to grade basic block patterns and adapted patterns ($\bar{x} = 2.13$) and that they can use the computers to visualize the laying out of pattern pieces on fabric ($\bar{x} = 2.31$). Further, results indicate that the teachers slightly disagree that they are competent in using fashion computer aided design software ($\bar{x} = 2.63$); that they are familiar with creating a mood board digitally using a Matboard ($\bar{x} = 2.26$) and that they can use the computer to visualize different fabrics against a chosen design ($\bar{x} = 2.5$).

The overall standard deviation of ($SD = 0.32$) indicated that there was insignificant variation in teachers' opinions.

Table 4: Teachers' knowledge and skills in using fashion computer aided design software

Knowledge and skills	$\bar{x}$	STD	DE
1. I am competent in using fashion computer aided design software	2.63	0.37	SLD
2. I am familiar with creating a mood board digitally using a Matboard.	2.26	0.39	SLD
3. I am able to use different kinds of apps used for sketching designs like coreldraw	2.17	0.32	D
4. I can use the computer to visualize different fabrics against abchosen design	2.5	0.39	SLD
5. I can use computer softwares to create basic block patterns like (Adobe illustrator)	2.26	0.21	D
6. I can use the computer to grade basic block patterns and adapted patterns.	2.13	0.16	D
7. I can use the computers to visualize the laying out of pattern pieces on fabric.	2.31	0.42	D
Overall	2.32	0.32	D

Legend: Descriptive Equivalent (DE)
 0-1.4 Strongly disagree (SD),
 1.5-2.4 Disagree (D),
 2.5- 3.4 Slightly disagree (SLD),
 3.5 - 4.4 Slightly agree (SLA),
 4.5 – 5.4 Agree (A),
 5.5-6 Strongly agree (SA)

Quantitative analysis revealed a gap in teacher proficiency in fashion computer-aided design (CAD) software. This finding was corroborated by qualitative interviews, in which teachers

acknowledged a lack of skills and knowledge in this area. Fashion design software, a subcategory of computer-aided design (CAD), empowers users to create both two-dimensional (2D) and three-dimensional (3D) sketches, illustrations, and technical packages (tech packs) with annotations for specific design elements. TUKA CAD, for example, offers a suite of features including pattern-making, automatic pattern updates upon size grading, marker making, and artwork/logo integration. Proficiency in such software can significantly reduce the workload of both students and educators, allowing for more time dedicated to practical garment construction and theoretical revisions. However, the study revealed a lack of familiarity with fashion CAD software among the educators. As Educator 4 stated, *“I am unable to comment as I have no knowledge of these programs.”* While not every educator was entirely unfamiliar, some, like Educator 11, acknowledged past exposure to software names during university studies, but lacked any practical experience. Educator 11 noted, *“While I have limited knowledge of these programs, I recall the names from university, but they were only mentioned briefly.”*

Thus, the importance of CAD software in modern fashion education cannot be overstated. Tools such as TUKA can streamline pattern making, grading, and marker making, ultimately enhancing efficiency (Oppong et al., 2014). These qualitative insights reinforce the quantitative findings, with teachers acknowledging their lack of knowledge and practical experience. As cited, teachers admitted complete unfamiliarity or only theoretical exposure during university, indicating a gap between academic knowledge and practical applications. The implications of this deficiency are therefore significant. The inability to use CAD software hinders teachers’ capacity to effectively prepare students for the contemporary fashion industry, where digital design tools are essential. It also limits the potential for efficient lesson delivery, potentially affecting students’ learning outcomes. The disparity between the

required industry skills and teacher competence prompts the need for immediate intervention through targeted professional development programs focused on CAD software training.

Comparison of teachers' readiness by age group

An ANOVA test was run to compare readiness to use ICT when teaching fashion and fabrics among teachers of different age groups [20-29 years, 30-39 years, 40-49 years and 50 – 59 years]. The results presented in Table 5 show that there was a significant difference ($p < 0.05$) in teachers' readiness by age group $F_{3,50} = 3.66$, $p = 0.02$. Specifically, post hoc analysis using Benferroni indicates that there is a significant difference on teachers from the age group 40-49 years ($\bar{x} = 4.16$), this group of teachers slightly agree that they ready to teach fashion and fabrics using ICT, whereas teachers from the age groups [20-29 years ($\bar{x} = 4.67$), 30 – 39 years ($\bar{x} = 5.00$) and 50-59 ($\bar{x} = 5.33$) all agree that they are ready to teach fashion and fabrics using ICT.

Table 5: Teachers' readiness to use ICT when teaching fashion and fabrics

		N	$\bar{x}$	SD	F	p
Readiness	20-29 years	15	4.67	0.72	3.66	0.02*
	30-39 years	27	5.00	0.74		
	40-49 years	9	4.16	0.69		
	50-59 years	3	5.33	0.58		
	Total	54	4.79	0.78		

*Significant at 0.05

** Significant at 0.01

Conclusion and recommendations

This study investigated the readiness of Fashion and Fabrics teachers in Eswatini to integrate Information and Communication Technologies (ICT) into their teaching. The findings revealed a positive teacher disposition towards ICT integration, with educators acknowledging its potential to enhance student engagement, improve academic performance, and streamline their workloads. However, a gap in teacher proficiency in fashion Computer-Aided Design (CAD) software was identified. The study employed a mixed-methods approach, utilizing both quantitative and qualitative surveys. Quantitative data analysis indicated a generally positive attitude towards ICT integration. Teachers expressed confidence in their basic computer skills and willingness to use ICT for educational purposes. Qualitative interviews corroborated these findings, with educators highlighting the potential benefits of ICT in student learning and teacher workload reduction.

However, this study also identified the need for further support in specific areas. Teachers reported a lack of familiarity with online quizzes, discussions, and the integration of digital curriculum materials. Additionally, the quantitative and qualitative data revealed a lack of knowledge and skills regarding fashion CAD software among the educators. Overall, the study suggests that Fashion and Fabrics teachers in Eswatini are enthusiastic about integrating ICT into their teaching. To ensure successful implementation, schools and policymakers should address the identified gaps in teachers' knowledge and skills through targeted training programs. Equipping teachers with the necessary expertise in using ICT and fashion CAD software will maximize the potential benefits of technological integration for both teachers and students.

Based on the findings of this study, targeted professional development programs are crucial for fully leveraging teachers' positive attitudes and existing basic ICT skills. These programs should focus on effectively integrating ICT into the Fashion

and Fabrics curriculum, specifically addressing the areas where teachers expressed less confidence, such as designing online quizzes and discussions. Furthermore, providing ongoing technical support and access to digital resources will facilitate a smoother transition and enhance the overall effectiveness of ICT integration into fashion and fabric education.

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