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An Analysis of the Online Teaching and Learning in Clothing and Textiles Programmes in Zimbabwe's Institutions of Higher Learning

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Abstract
The coronavirus, because of its contagious nature, came with many adjustments to our daily lives. One of the adjustments is how teaching and learning is done across the board from primary schools to institutions of higher learning. The purpose of this study was to analyse the online teaching and learning in clothing and textiles programmes in Zimbabwe's institutions of higher learning. This is especially in the light of practical subjects such as Clothing and Textiles, which, are supposed to include practical and hands-on activities. The study selected three lecturers and thirty students from the three institutions of higher learning that delivered online lectures in Clothing and Textiles. In-depth interviews, questionnaires, and observation sheets were the instruments used to collect the data. The collected was analysed both qualitatively and quantitatively in line with convergent imperatives for triangulation and validation purposes. The TPACK was used as a theoretical lens to guide this inquiry. The findings revealed lack of suitable applications and software for virtual prototyping for the online teaching of the practical component of Clothing and Textile programs in higher education institutions in Zimbabwe. It was concluded that the lack of resources renders online teaching and learning as a pedagogical black box, as the lecturers become hand-capped to effectively teach for enhanced student comprehension. The study recommended that Clothing and Textiles departments in Zimbabwe encourage the design of online practical modules for use by lecturers in times of pandemics.

Introduction

Because of its contagious nature, the coronavirus has come with many adjustments to our daily lives. One of the adjustments is how teaching and learning are done across the board, from primary schools to institutions of higher learning. Online learning is generally embraced as one of the critical solutions to safe engagement in teaching and learning. Whilst many online learning platforms sprouted rapidly to allow teaching and learning to happen in real-time, these mainly cater to the theoretical aspects of different disciplines and, unfortunately, do not include crucial practical components. In the Zimbabwean context, the traditional teaching of Clothing and Textiles related programmes before the pandemic involved the theory part, where students are taught theoretical ideas about Clothing and Textiles and the practical component, where the students produce actual garments and go for

attachment in Clothing and Textiles industries (Chibindi, 2017). However, whilst some scholars argue that real change takes place in deep crisis (Fragouli & Tourlaki, 2020), in the Zimbabwean context, questions arise about how prepared Zimbabwean higher education institutions (systems) are for the effective adoption of online modes of teaching and learning. This is especially true in the light of practical subjects such as clothing and textiles, which should include theoretical content and practical and hands-on activities, all done virtually. In a bid to share some insights on the Zimbabwean context, the study was guided by the following research questions:

- How have Zimbabwe's higher education institutions embraced online learning in the teaching and learning of Clothing and Textiles programmes?
- Which resources do lecturers and students in Zimbabwe's higher education institutions have in place for online practical lessons in Clothing and Textiles programs?

Literature Review

Clothing and Textiles in higher education institutions involve theoretical and practical components. The practical component entails the involvement of students in the production process of textiles, fashion designing, garment construction and entrepreneurship (Dzikite, 2017). Several factors that affect the teaching and learning of Clothing and textiles are discussed in the next section.

Factors affecting the teaching and learning of practical subjects

Empirical evidence shows that the teaching and learning of practical subjects are affected by many factors. Firstly, some communities generally despise hands-on courses like Clothing and Textile, Carpentry, Metalwork, Brick laying and driving, as they are assumed to be suitable only for low academic performers (Manwa, Mudekunye, & Mpofu, 2020). A study by Chiweshe, Xavier, Cryton and John (2013) on the gloomy outlook of practical subjects highlighted that practical subjects are rated lower in academic value than theory subjects. This probably explains why some parents would pass comments such as '*How could you fail just to cook and sew'* (Chiweshe et al., 2013, p. 893).

Secondly, the unavailability of physical and online resources hinders the teaching and learning of practical subjects (Manwa, 2019). Furthermore, if the machinery is outdated and not in line with contemporary industrial and online practices, it hinders the teaching and learning practical subjects (Manwa, 2019).

Thirdly, a larger teacher-pupil ratio also negatively affects teaching practical subjects (Rwamu, 2019). Large class sizes affect student's performance because most students do not have the chance to work with the machinery. The teacher also does not have time to engage all students on a one-to-one basis in a large class when teaching a practical lesson both online and face-to-face (Audu, 2019).

Lastly, student motivation and the teaching approach lecturers use are crucial factors affecting practical subjects' teaching and learning. Pardines et al. (2014) explained that self-motivation and good time management are essential factors that affect teaching and learning. This is particularly relevant in online teaching and learning setups where students should be self-motivated and disciplined to stay focused on provided lectures.

Methodology

This study employed a descriptive case study design, using a mixed-method approach to collect data through in-depth interviews, questionnaires, and observation. Convenient sampling was used to select three institutions that offered Clothing and Textiles programs, and three lecturers from these institutions were selected. Simple random sampling was used to select ten students from each institution, totalling 30. The collected data were analysed qualitatively and quantitatively in line with

convergent imperatives for triangulation and validation purposes. The findings of the study are presented in the following sections.

Results and Discussions

Demographic characteristics of the respondents

Table 1. Student demographic profile (N=30)

variable		***Response***	
		Frequency	%
Gender	***male***	4	13.3
	female	26	86.7
Age	***Below 20***	0	0
	21-30	15	50
	31-40	11	13.4
	Above 50	0	0
Highest qualification being studies	***Diploma***	0	0
	Bachelor	30	100
	Master	0	0
	PhD	0	0

As shown in Table 1, most of the students were female (86.7%). This probably indicates the gender bias or stereotyping of people enrolling for Clothing and Textiles as a program. In addition to most of the students being females, 50% of the students were between the ages of 20 to 30 years of age. This indicates that most university students are in their youth stage. Furthermore, all the interviewed students had bachelor's degrees.

Table 2: Lecturer demographic profiles

variable		***Response***	
		Frequency	***%***
Gender	***male***	***1***	***33.3***
	female	***2***	***66.7***
Age	***Below 20***	***0***	***0***
	21-30	***0***	***0***
	31-40	***2***	***66.7***
	Above 50	***1***	***33.3***
Highest qualification being studies	***Bachelor***	***0***	***0***
	Honors	***0***	***0***
	Master	***3***	***100***
	Doctorate	***0***	***0***
Teacher education training	***Yes***	***3***	***100***
	No	***0***	***0***
Teacher education qualification	***Diploma in Education***	***0***	***0***
	Bachelor of education	***2***	***66.7***

	FETC	***0***	
	Post-graduate certificate in education	***1***	***33.3***
Years of higher education teaching experience	***2-3years*** ***3-5years*** ***5-10years*** ***10-20years***	***0*** ***0*** ***2*** ***1***	***0*** ***0*** ***66.7*** ***33.3***

Table 2 shows that the three lecturers investigated were master's degree holders, and their ages ranged from 40 to above 50 years old. They all had teacher training education and 5 years and above teaching experience, meaning they were all qualified and had experience teaching a bachelor's degree in clothing and textiles. This had implications for the type of responses they were giving regarding resources they could identify as crucial for their online teaching.

Modules taught, level and online practical teaching by lecturers

Table 3: Modules taught by different lecturers who were interviewed

Module taught	**Level taught**		**Engaging in online teaching (Theory)**		**Engaging in online teaching (Practical)**	
	Bachelor	**Masters**	**Yes**	**No**	**Yes**	**No**
Pattern making	3	0	3	0	0	3
Clothing Construction Technology	3	0	3	0	0	3
Designing	3	0	3	0	0	3
Advanced Textiles	3	0	3	0	0	3
Pattern Grading	0	0	3	0	0	3
Fashion illustration	3	0	3	0	0	3
Grooming & Self Presentation	3	0	3	0	0	3
Other	0	0	0	0	0	3

Table 3 shows that the most common modules taught by the lecturers interviewed in the three intuitions are Pattern Making, Advanced Textiles, Clothing Construction Technology and Designing. All the above courses have the theory and practical component. It emerged that whilst the theory component of a Clothing and Textiles program was taught to undergraduate students studying for bachelor's degrees through Google Classroom and Zoom online platforms, none of the practical components was taught online. The idea (or the fact that) that all three lecturers taught the same

content had implications for designing an online module template for teaching Clothing and Textiles online that is usable across different universities.

Resources for teaching the practical component of Clothing and Textiles online

Table 4 Online Tools used in the teaching of Clothing and Textiles programs

Online Tools	**Response**			
	Lecturers N=3		**Students N=30**	
	Yes	No	Yes	No
Record and edit audio clips	0	3	0	30
Create annotated, interactive and engaging video content	1	2	0	30
YouTube video editor	0	3	0	30
Create visually engaging content using:	0	3	0	30
Piktochart	0	3	0	30
Canva	0	3	11	19
google draw	0	3	0	30
Use social networking websites to create plans, connect, discover new content on:				
WhatsApp Twitter	3	0	30	0
Facebook	3	0	30	0
Google plus	3	0	30	0
LinkedIn	3	0	30	0
Use blogs and wikis to create participatory spaces for students using:				
Blogger	3	0	30	0
WordPress	0	0	0	30
Weebly	0	0	0	30
Use social bookmarking websites curate and share resources with your class				
Edu clipper	0	3	0	30
Pinterest	3	0	30	0
Create engaging presentations	0	3	0	30
Google slides	3	0	30	0
Create digital portfolios	0	3	0	30
Silk	0	3	0	3
Seesaw	3	0	30	0
Google sites	0	3	0	30
Create non-traditional quizzes, or riddles	0	3	0	30

As shown in Table 4, the data summarises the responses of 3 lecturers and 30 students regarding their usage of various online tools in the teaching and learning of Clothing and Textiles online. The key findings were as follows for each tool.

Neither lecturers nor students utilised tools for recording and editing audio clips, using a YouTube video editor, or creating visually engaging content using Piktochart, Google Draw, WordPress, or Weebly. The table above showed that social bookmarking websites such as Edu-Clipper Silk, as well as tools for creating engaging presentations, digital portfolios, non-traditional quizzes, or riddles, were never utilised by both lecturers and students. On the other hand, online tools such as social networking websites such as WhatsApp, Twitter, Facebook, Google Plus, LinkedIn, Pinterest, Google Slides and Seesaw were used by lecturers and students for networking and educational purposes. The tool for creating annotated interactive and engaging video content was only used by one lecturer, and none of the students used it. Notably, a tool such as Canva was used by at least 11 students even though no lecturer used it.

Overall, the data above shows a significant lack of usage of most online tools. This has negative implications for the quality of the teaching of clothing and textiles online. In addition,, the data reveals lecturers' and students' explicit preference for specific tools over others. In other words, the findings show that while some digital tools are fully integrated into the teaching and learning process, others are underutilised or possibly not understood by students and lecturers. Scholars such as Khan et al., (2017) pointed out that academic achievement depends on the lecturer's ability to use the appropriate media for suitable teaching purposes. For instance, a lecturer trying to use WhatsApp for a hands-on lecture indicates skill or knowledge deficiency in using the relevant digital technologies for communication, like virtual labs and Ed Puzzle. Based on these findings, efforts to improve the adoption and usage of the tools mentioned above could enhance the overall teaching and learning experience in online Clothing and Textiles education.

Table 5 Hardware and software used by the three lecturers and students

Hardware	***Lecturers Response***		***Students Response***	
Hardware Type	Yes	No	Yes	No
Lenovo ThinkPad	1	2	13	17
Acer hardware visualization	2	1	2	28
Software used in design and practical activities				
Open access software	1	2	10	20
Tailor nova	1	2	5	25
Photoshop	2	1	0	30
CorelDraw	2	1	5	25
Gerber	0	3	0	30
AutoCAD	0	3	0	30
Wildginger	0	3	0	30
Optitex	0	3	0	30
3D-CLO	0	3	0	30
3D-Body scanner	0	3	0	30

The data above suggests that there is limited use of suitable hardware and software for teaching clothing and textiles online. For instance, the findings from Table 5 revealed that 1 lecturer and 10 students from the three universities investigated use Open Access. Additionally, two lecturers used

CorelDraw and Photoshop, and Tailor Nova was only used by one lecturer; few students used these two software. In addition, none of the students and lecturers used Gerber, AutoCAD, Wildginger, Opitex, 3D-CLO and 3D-Body scanners. Notably, whilst all this mentioned software could be applicable for teaching online Clothing and Textile practical modules, the fact that because most of them were not used to teach, this indicates the need for both lecturers and students to be trained on the use of such online tools in a bid to improve the teaching and learning experience online.

Other online teaching resources

Table: 6: Any other online resources used by students for practical component

Other resources used by students	**Nature of the application**	**Used for**	**Response Use/No use**	
			Yes	No
Custom T-shirt	Free downloadable and installable application	Designing	25	5
250 Complete dress pattern	Free downloadable installable application with 250 patterns to choose from and modify if you want to.	Pattern making	30	0
Draw fashion Clothes	Free downloadable application with fashion illustrations collection of recent clothes, popular and random	Designing	17	13
Drawing Clothes ideas	Free application with ideas for clothes designs	Designing	24	6
TECHPACKER	Free online Guide on the fundamentals of pattern making	Pattern making	28	2
Creative Curator	Free online beginners pattern making guide	Pattern making	22	8

Table 6 shows the other resources used by the students, not the lecturers. This software primarily focuses on practical aspects of designing and pattern making, not virtual garment prototyping. These resources provided students with tools and guides for designing clothes, exploring fashion illustrations, generating ideas for clothes design and fundamentals of pattern making. For instance, custom T-shirts, Fashionable clothes, and drawing clothes are design ideas. Pattern-making resources used by some students were 250 Complete Dress Pattern, TECHPACKER and Creative Curator. As generally portrayed in Table 6, students tend to utilise online tools more extensively than the lecturers, indicating their reliance on digital resources for online learning. The high usage of this software by students may signify the generation gap in technological use during teaching and learning, and the relatively low usage by lecturers could be a pointer to the need for further training on integrating technology during their teaching practice.

Table 7. Challenges faced by lecturers and students due to lack of suitable resources

(Key: LA-Lecturer from University A. ST8A-Student from University A; ST8C-Student from University C)

Emerging theme	Sub-themes	Supporting statement / narration
Lack of suitable teaching and learning online resources	lack of online resources	*My wish is that if I could be supported with resources for teaching the practical component of Clothing and Textile online, then I will effectively teach all the aspects of Clothing and Textiles- (LB).* *I do not have a laptop and suitable software. I only use my phone, which sometimes have problems of freezing when I try to open different programmes at the same time* (ST12B)
	Other resources	*I sometimes use these open access free applications for pattern making like TECKPACKER because at college there is no specific software for pattern making-* (ST19A).
Issue of connectivity	Poor bandwidth	*It becomes a nightmare and stressful to go dead on the other side of the line when you know that students are waiting and listening attentively on the other side of the line due to erratic network or load shedding-* (LA).
	Lack of data bundles Expensive data costs	*I usually do not attend all the lectures up to the end, because of lack of data bundles. I would rather attend partly and spare the data bundles for other lectures-* (ST22C). *Not all of them attend lectures because of data shortage, -* (LC).
Load shedding	Lack of power supply to use gadgets	*For me load shedding is always a problem, as I have to postpone or cancel lectures quite often-* (LC).

As shown in Table 6, it emerged that the lack of resources poses challenges for both the students and their lectures.

Lack of suitable teaching and learning resources: The challenges faced by lecturers investigated ranged from lack of suitable software to crucial hardware and to lack of a conducive environment for effective online teaching. Two of the three lecturers indicated that they lacked suitable software, and the automated computerised machinery (all the three lecturers) for operationalising the software. For instance, one of the lecturers, when asked what he/she thought would be ideal resources for her to teach Clothing and Textile online effectively had this to say.

My wish is that if I could be supported with resources for teaching the practical component of Clothing and Textile online, then I will effectively teach all the aspects of Clothing and Textiles. (LB)

When asked what resources you think have to be added to ensure effective online teaching and learning, LB answered: *If they can provide CAM, CAD, Gerber and automated computerised machinery.*

A literature review indicated that one of the software used for the effective online teaching and learning of students is CAD/CAM, which is crucial for designing and manufacturing garments (Mazharul, 2021). The statement by (LB) of not having CAM/CAD and Geber indicates that the institution lacks significant resources for teaching Clothing and Textile practical modules online. It also emerged that some students, for example (ST19A), use open access software because the institution does not provide a specific software for Pattern making online. *I sometimes use open-access free applications for pattern making, such as TECKPACKER, because there is no particular software for pattern making at college (ST12B).*

Most students also expressed difficulties accessing suitable gadgets for online educational needs. Most students expressed that they could not afford laptops and smartphones as their costs are beyond reach, and institutions do not offer such gadgets at home. For instance, the statement by one of the students: *I do not have a laptop; I only use my phone, which sometimes has problems freezing when I try to open different programs at the same time (*ST12B**)**. As ingrained in this statement by student **ST12B**, the institution does not provide students with laptops for use at home during online learning. This implies that students who cannot afford such learning resources are left behind during online teaching and learning. This corroborates findings by Wang et al. (2018) that places the problematic issue of lack of resources as this hinders effective learning and teaching. Regarding the lack of a conducive environment for effective teaching, the lecturers and students indicated the absence of a reliable supply of electricity to keep educational gadgets on, lack of reliable data due to high data costs and general poor connectivity bandwidth. For instance:

For me, load shedding is always a problem, as I have to postpone or cancel lectures quite often- (LC).

I do not have a laptop and suitable software. I only use my phone, which sometimes has problems of freezing when I try to open different programmes at the same time (ST12B)

The statements by Lecturer C and the students indicate that the lack of material and non-material resources disrupts online teaching and learning**.** The lack of new technological software and machinery in this discipline of Clothing and Textile in a typical developing country like Zimbabwe corroborates findings by Pha and Ngunyeni (2020), who unveiled that changing from traditional teaching to virtual teaching and learning has been a challenge for many learning institutions in developing countries because of lack of resources.

Discussions

The findings show that most students participating in the Clothing and Textiles programme are females. This finding aligns with those of Nelson and McLeod (2005), who observed that women are more sensitive and pay particular attention to issues that relate to smartness, dress, body, shape, and self, which probably explains this type of enrolment pattern than men. The findings show that most of the students are in their youthful stage. This has positive implications because if proper strategies are implemented, most students could quite quickly grasp the notion of online learning of Clothing and Textiles modules. This is because the youths of today can learn technology use quite quickly compared to adults of today as they are not afraid to try out and experiment with technological use on their computers (Sebastiaan & Peek, 2017).

It emerged from the findings that all the lecturers investigated had ages ranging from 40 to 60 years. Furthermore, they were all Master's degree holders. Their level of education implies that if given the

appropriate training and support in the use of technology during their online teaching of Clothing and Textiles, they can use their educational prowess to master the new technological demands with ease. This is because scholars such as Lee and Hallak (2018) point out that it is pretty easy to teach individuals with higher degrees as they can quickly transfer what they know into new learning. However, their age range (40-60) may disadvantage them in thoroughly learning, grasping and copying the latest technological demands because they might have some inherent fear of the unknown to try out new technologically related things, as observed by Sebastiaan and Peek (2017).

Furthermore, the research findings revealed a significant lack of appropriate resources for teaching the practical component of Clothing and Textile online in higher education institutions in Zimbabwe. All three institutions investigated were found to have no software such as CAD for designing, CAM for manufacturing, and hardware such as automated computerised machines that scholars such as Burke and Sinclair (2014) recommend that they should be part of institutions such as industries and other places where Clothing and Textiles are at the fore. Due to this shortage of resources, lecturers used it to justify why they forgo teaching the practical component of Clothing and Textiles online. Thus, whilst some essential software and hardware are available for teaching in some institutions, the results indicate a shortage of current software and hardware in institutions of higher learning in Zimbabwe regarding the effective online teaching of practical components of clothing and textiles. As unveiled in this inquiry, one can argue that the transition from face-to-face traditional education to online modalities has been smooth for some educational institutions and complex for most institutions with limited resources, especially in developing countries, as also unveiled by other scholars (Pham & Nguyen, 2020). In addition, it was notable that all three institutions are equipped with 'other' teaching resources. However, these other curricular resources are only suitable for in-class or face-to-face teaching and learning about clothing and textiles. This has implications that institutions of higher learning ought to consider securing software for online lecturing on clothing and textiles.

One can argue that this scarcity of resources poses a challenge to the effective transition from traditional face-to-face education to online learning, particularly in developing countries like Zimbabwe. This is because, in an ideal scenario, Clothing and Textile education should encompass theoretical knowledge and practical skills, emphasising the latter (Mupfumira &. Nyaruwata, 2020). Furthermore, scholars such as Bverekwa, Chavhunduka, and Chinyemba (2011) argue that sufficient machinery is essential for achieving this field's teaching and learning objectives. Thus, teaching only theoretical aspects and excluding the practical elements, which was noted in this inquiry, inherently compromises the quality of teaching and learning about clothing and textiles. This is because the practical aspects need the theory to be consolidated with the theoretical components learnt and vice versa. This is because as one does the practical, concrete elements of Clothing and Textiles, one applies the theoretical issues and, in the process, relearns by restructuring the schema in one's brain as postulated by Piaget (1952). Thus, one can also recommend that universities should be equipped with adequate technological resources to facilitate students' online learning. This is because seemingly the shortage of resources has the potential to cripple the online teaching and learning of the practical component of Clothing and Textile in the institutions of higher learning.

Conclusions

Key findings include the significant absence of practical components in online lectures, primarily focusing on delivering theoretical aspects of clothing and textiles only (downplaying the crucial practical aspect) through PowerPoint presentations. This deficiency hindered the application of constructivist learning theories, limited student-student interactions, and upheld students' diverse learning styles in any given group. Recommendations from learning theorists such as Taylor &

Hamdy (2013) and Vygotsky (1978) emphasise the importance of incorporating varied media and interactive learning experiences to cater to the learning preferences of diverse students. Furthermore, lecturers and students encountered specific challenges related to online learning, such as poor network connectivity, lack of suitable resources, and digital illiteracy. Addressing these challenges requires a comprehensive approach involving investment in resources and training in technological proficiency for both lecturers and students. Moreover, there is a need for continued research and collaboration to enhance the effectiveness and inclusivity of online education in Clothing and Textiles. The study underscores the complexity of online teaching and learning of the practical component due to limited resources and expertise.

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