

Curriculum Review and Education 5.0 in Higher Education in Zimbabwe: A Review of Textiles and Clothing-related Programs

Chipo Chuma

Chinhoyi University of Technology, Bag 7724, Chinhoyi, Zimbabwe.

Email: cchuma1976@gmail.com

Abstract

With the Zimbabwe Ministry of Higher, Science, and Tertiary Education (ZMHSTE) implementing the doctrine Education 5.0, there was an emphasis on curriculum review to align programs with the objectives of the doctrine. The main goal of the study was to examine areas in which the content of the curriculum should be focused on Textiles and Clothing related disciplines. As research methods, a qualitative analysis of literature search was conducted during a period of Fulbright scholar study at a US institution to compare content offered in textiles and clothing-related programs. The outcome of the study declares the areas such as exponential disruptive technologies in the textiles and clothing integrated enterprise, brand innovation, supply chain management, data science in the curriculum, and sustainable design and manufacturing as gap areas that were not thoroughly included in the existing programs in Zimbabwe. These content areas should be considered as part of the review to align the programs with the essence of Education 5.0.

Keywords: Exponential disruptive technologies; brand innovation, supply chain management, data science, sustainable textiles.

Introduction

In response to the widespread call for reform, the Zimbabwe Ministry of Higher, Science, and Tertiary Education (ZMHSTE) is making huge strides to transform university education by reviewing and creating new curricula in response to changing knowledge and skill requirements. Thus, the ZMHSTE adopted the doctrine of Education 5.0. In addition to teaching, research, and community service, the Ministry added innovation and industrialization as additional pillars to accelerate Zimbabwe's transition to an innovation-led and knowledge-based economy. Grecikovd, Kordos, and Navickas (2021) note that it will not be possible to manage changes in curriculum review in a few weeks, however, creating such a responsive curriculum and implementing the transitions requires a change in the usual *modus operandi* of higher education. According to Sasipraba et al. (2020), education worldwide is significantly changing, and new approaches and content will be necessary to prepare individuals for the changing social and industrial markets. A good case in point is the changes brought by the Covid-2019 pandemic. The pandemic affected and transformed the education system into an online space. Teachers and

students had already and are experiencing this phenomenon, hence opening space for adjustments in the education system. It turns out that those forms of digital content, knowledge, and innovations will necessarily need to be developed in students.

Authors such as Bongomin et al. (2020) agree that skills of innovation and the creation of industry can be built by developing a new curriculum in the old field of study to incorporate the infrastructure for the industry. Past research confirmed earlier that developing a new curriculum can only be achieved through extensive research and collaborations in curriculum development (Kouwenhoven, 2009; Grmenova, 2019). Thus, the success of the implementation of Education 5.0 in Zimbabwe requires comparative studies in curriculum with international partners to prepare students who will be able to function not only in local contexts but in cross-cultural contexts. New skills and competencies will be required, so the skills of the workforce will have to be shifted in a whole new direction. That is why this paper offers an attempt to analyze the influence of Education 5.0 on Zimbabwe university curriculum contents with a focus on Textiles and Clothing-related disciplines. Specifically, the paper examines the areas on which content of the curriculum should be focused more as part of the curriculum review for the implementation of Education 5.0 in Textiles and Clothing-related disciplines.

Literature Review

Education 5.0

Education 5.0 in Zimbabwe is anchored on developing and delivering higher education system that generates knowledge that results in goods and services (ZMHSTE, 2018). Traditionally education in Zimbabwe has not extended to the direct expansion of industries. In other words, there has been a disconnect between knowledge gained in Higher and tertiary education systems and the local environment as the education system seemed to be concentrating on exotic application domains. This entails that the emphasis of Education 5.0 is to produce graduates who will be equipped with skills that empower them to be innovative towards societal development through transformative science and technology knowledge applications that deliver goods and services (Togo and Gaidzanwa, 2021). The curriculum shifts from preparing students for white-collar and blue-collar jobs to preparing them for job creation by using generated knowledge. The idea is obviously to remodel the higher education curricula to improve the competitiveness of local higher and tertiary qualifications. Education 5.0 is based on the interconnection and interaction of people, technological tools, and machinery with each other so that all previously untapped information is to be fully utilized in Zimbabwe.

The Textiles and Clothing related programs in Zimbabwe

Graduate Textiles and Clothing programs are currently offered in ZMHSTE. University programs currently offer a Bachelor of Science in Fashion design that concentrates on the design, and development of apparel, fashion and textiles products and a Bachelor of Textiles Technology that focuses on the engineering of textiles (Dzikite, 2017). Some polytechnic colleges offer diploma programs in Fashion Design and Garment construction with a particular emphasis on improving hands-on experiences in the learning process. Studies have shown that most students that choose to pursue an education in Textiles and Clothing-related disciplines in Zimbabwe would like to specifically select to seek employment in the few textiles and clothing manufacturing industries.

There is, therefore, the need for most institutions that offer Textiles and Clothing-related programs in Zimbabwe to review, revise and update their programs in line with Education 5.0 to prepare graduates to be innovative to be able to create innovative textiles and clothing products and enterprises.

Research methodology

Based on the educational reform in Zimbabwe, the main aim of this study was to examine the areas in which content of education should be focused in Textiles and Clothing-related programs concerning Education 5.0. As a research method, a literature survey was conducted during a Fulbright period of reading and research at a United States of America institution that offers Textiles and Clothing programs. A comprehensive literature search was done in electronic databases such as Google Scholar, Science Direct, Scopus, Taylor and Francis, and Emerald insight, to examine the educational content reviewed and to compare it with what is offered in Textiles and Clothing programs in Zimbabwe. The data was collated into a narrative and content analysis was used to analyze it.

Results and Discussion

The findings of the study showed areas in which content should be focused more on Textiles and Clothing programs with the implementation of Education 5.0. The results were presented, analyzed, and discussed in the following paragraphs.

Exponential disruptive technologies in Textile and clothing Integrated Enterprise.

The findings of the study showed that content related to exponential disruptive technologies in textile and clothing integrated enterprise is loosely covered in almost all textiles and clothing programs in Zimbabwe. The literature demonstrates that curriculum had to be adapted to reality in the present and future and add new education content with highly specialized skills at the forefront of education at all levels such as automation, artificial intelligence, 3D digital skills, and robotics. This would be necessary to address the lack of expertise and develop innovative graduates who can create textiles and clothing industries and enterprises. Past research like McQuillan (2020) supports the idea that contemporary textiles and clothing designers explore simultaneous and hybrid practices in their work and methods which integrate the design of form into the design of fashion. It, therefore, stands that tools that enable the fluid interaction between design and fashion and textile expression, become valuable in this space. The curriculum must stress the importance of digital tools as an addition, not a replacement. Building on such knowledge and skills is essential for innovation and industrialization. Gress, et al (2016) and Grecikova et al (2021) affirm that the spectrum of knowledge and skills is driven by forces of digital technologies and artificial intelligence. As such the knowledge of 3-dimensional(3D) technologies is a major tool for the textiles and clothing students have at their disposal in Zimbabwe. The use of 3D technologies can enable international collaborations between teams which can lead to a shortened design and development process in an industry context. Though the rate of 3D technology takes up is lower in Zimbabwe, the universities must be at the forefront

of bringing digitalization knowledge and skills to graduates for them to be innovative and create knowledge for the production of goods and services. Past research uses industrial use of 3D technologies even supports that knowledge of optimized features and processes through digitalization in a medium-sized enterprise can lead to increased revenue by millions of dollars a year (Hunt and Sankot, 2019).

Brand Innovation and Management in Textiles and Apparel

It came out from the study that most if not all textiles and clothing programs in Zimbabwe do not have the issues of brand creation and innovation as part of the curriculum. This creates a skill gap in the management of fashion brands. Researchers like Sala (2019) assert that students must be exposed to frameworks and knowledge to create new and innovative brands through a variety of strategies that explore design challenges. This is necessary to help designers in acquiring a better understanding of user needs and their characteristics to ideate and prototype new brands. As technologies develop in 3D scanning, CAD, generative design, and machine learning, a graduate can create exciting unique fashion and textile brands that target even the military, surgeons, and construction workers. It is, therefore, vital for a student to be exposed to brand management, distribution channels, and markets with positioning in the local, regional, and globally competitive environment. This would provide an in-depth understanding of the utilization of textiles and fashion brand marketing communication and promotion tools to build, maintain or expand the brand's value in the textiles and clothing complex market. Researchers like Chen, Qie, Memon, and Yesuf (2021) advocate for content added with a dimension of clothing brand green innovations as this can essentially foster green purchase intentions and behavior among consumers.

Retailing and Supply Chain Management in Textiles and Clothing

With universities mandated to produce goods and services that lead to industrialization, the inclusion of supply chain management becomes key content in programs of textiles and clothing production. Supply chain management has been one of the key competitive aspects fought nowadays between global companies and regions as emerging technologies are used for this purpose. In the textile and apparel complex, the supply chain concept is viewed as a convenient management tool for all manufacturers who strive to improve their product quality, reduce their product and service costs, or shorten their product delivery and response time in a competitive market. Ha-Brookshire (2015) emphasizes that graduates must understand the coordinated set of techniques to plan and execute all steps in the local, regional, and global network used to acquire raw materials from vendors, transform them into finished goods and deliver both their goods and services to customers. In support, Zhong and Mitra (2020) add that content should be focused on the role of the merchandiser and merchandising function together with the measures of performance required by the textile and clothing businesses. With internationalization, the aspects of global trade and sourcing become imminent for graduates to gain knowledge on global sourcing strategies and the identification and analysis of major strategic decisions used in global sourcing as impacted by global trade dynamics (Birou, Lutz, and Walden, 2022). This elaborates that knowledge of global sourcing in the curriculum would help graduates make informed decisions on fiber choices, better understand trade-offs users may make between different raw materials, and become more aware of product performance, requirements, and design compliance

issues. All this will help graduates become true experts in the products they will design and develop.

Data Science in curriculum

Another area that emerged from the literature survey was the inclusion of data science in the curriculum. All textiles and clothing-related programs in Zimbabwe do not have this as an independent course or module but are covered as components within modules such as Statistics or Research Methods. Past studies perceive data science as a necessity and should be integrated into textiles and clothing programs (Merryman & Sheng, 2021). The addition of data science will help in building and structuring more advanced educational goals because students would acquire skills necessary for ideation and problem-solving. As the textiles and clothing industry becomes more data-driven, and due to increasing accessibility of data sets from online media to market intelligence, more textiles and clothing companies use big data and logical tools to advance their operations, and more associated skills are needed by graduates (Moore, 2019; Clayton & Clopton, 2019). It will be crucial for the textiles and clothing graduates to be oriented in big data, be able to quickly retrieve information, work with it and then apply it to practice. As observed by Acharya, Singh, Pereira, & Singh, (2018) and Silva, Hassani & Madsen (2019), the usage of data science in the textiles and clothing industry has been widespread in inventory control, sales forecasting, and analyzing consumers' purchasing behavior. Further research supports that apparel companies have benefited from mass customization on a large scale by utilizing data science. Through analyzing data inputs of consumer purchasing history and demographics, data science-based mass customization enabled apparel companies to successfully cater to consumers' preferred styles and meet their growing needs (Tiihonen & Felfernig, 2017; Dubreuil & Lu, 2020). In this sense, textiles and clothing students can leverage data science to enhance or change how they create new artifacts. As an example, students can integrate data analytics into their fashion design process. By comparing trends, big data tools can help forecast fashion trends in terms of color, pattern, or style. This can then be used to generate ideas for new designs, products, and brands.

Impact of industry on the environment

It has been noted that most programs cover sustainability content loosely, yet it must be given the detail it deserves. Researchers like Murzyn-Kupisz and Ho?uj (2021, p.1) advocate that 'textiles and clothing education requires multidimensional adjustments to curricula, reflecting the complex nature of sustainability problems. Innovation and development of goods and services with unsustainable practices put resources at risk and contribute to global climate change (UNESCO, 2017). The textiles and clothing industry has been a leading contributor to environmental degradation from manufacturing processes through to sales, distribution, and consumption for decades (Alamsyah, Othman & Mohammed, 2020). Therefore, students in textiles and clothing programs in higher education are both consumers and future professionals who will know to effect sustainable industry practices through their innovations and purchases. Research regarding educating students about environmental sustainability suggests that skills can be improved when students have a semester-long exposure to topics instead of just short introductions within another module or course (Connell & Kozar, 2012; Gam & Banning, 2020). There need to study the structure and organization of the integrated textile and clothing complex and its strategic

functions become very imminent. Critical stages involved in the manufacture of textile and apparel products must be examined in detail to provide the student with knowledge and skills to generate sustainable textile solutions characterized by radical experimentation and a firm commitment (Dltria & Colombi, 2022). Students and graduates can become agents of change by providing innovative knowledge-based and practical solutions that promote sustainable development goals through which social, economic, and environmental challenges are addressed in the textiles and clothing industries.

Interdisciplinary Perspectives

In Zimbabwe it was noted that departments and programs are often structured in isolation, not allowing the expertise and knowledge of the students in one discipline to flow to another program concurrently. This form of soloed knowledge was revealed in the study in the textile and clothing-related disciplines where retailing, supply chain and design are often separated into different programs. Results of the literature search revealed that there is a need to change the curriculum in higher education such that instead of narrowly being specialized in one area, emphasis ought to be on a significantly broader overview as people need to be educated in systemic and interdisciplinary thinking within all types of schools (Grencikova et al,2021). This corroborates well with Gtancay & Dudas (2019) who propose that education characteristics might include cross-institutional and cross-cultural opportunities within which the students become creators of knowledge and artifacts that are shared through networks in on/offline environments. Past research noted with concern that while effective collaborations help to produce success and innovation in the textiles and clothing industry, few curriculum opportunities exist for students to gain a holistic view of how the design, merchandising, and retailing principles are brought together as a collaborative effort (Frazier & Cheek, 2016; Wilson & Zamberlan, 2017). Therefore, creating an interdisciplinary learning environment that encourages professional behavior, leadership, and critical thinking is vital in preparing students for the current business environment. Dreamson (2017) asserts that interdisciplinary study provides students with the opportunity to synthesize knowledge and skills, make connections between fields of study, to consider more than one disciplinary approach or methodology in examining or responding to complex problems. For example, a module selected by a student on Agricultural Biotechnology may enable the student to understand and address the basic biological science behind the technology thereby connecting the student to understand better the use of bio-textiles as sustainable innovations. Issues of microeconomics and macroeconomics studied from the business perspective enable the student to understand microeconomic analysis of business decisions in competitive and non-competitive markets, free trade, and tariffs, and to aggregate economic analysis encompassing current public policy issues and effects of monetary policies on textiles and clothing business.

Conclusions

The main goal of this study was to identify the areas in which the content of textiles and clothing-related programs should be focused more on the recently propounded Education 5.0 in Zimbabwe. In this paper, it has been revealed that the curriculum had to be adapted to the reality of the exponential disruptive technologies. This would be necessary to address the lack of expertise and develop innovative graduates who can create textiles and clothing industries and

enterprises. Along with the implementation of new technologies, it was concluded that students be exposed to frameworks and knowledge of fashion branding and management. This is necessary to help designers in acquiring a better understanding of user needs and their characteristics to ideate and prototype new innovative fashion brands. In the textile and apparel complex, the supply chain concept should be studied as a convenient management tool for designers and manufacturers to strive to improve their product quality, reduce their product, and service costs or shorten their product delivery and response time in a competitive market. As the textiles and clothing industry becomes more data-driven, the study established data science as a necessity and should be integrated into the textiles and clothing programs. It will be important for the future workforce to be able to work with big data to be able to quickly find information and apply it in practice. Knowledge of sustainability and environmental issues should continue and increase in textiles and clothing education to produce informed professionals who will have the courage to change industry practices through sustainable innovations. Finally, it was established that textiles and clothing curricula incorporate interdisciplinary knowledge, cross-institutional or cross-cultural opportunities within which the learners become creators of knowledge and artifacts that are shared through a variety of environments.

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