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South African fashion design entrepreneurs' awareness and practices of sustainable fashion supply chain operations

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Abstract

The textile and clothing industry intensifies pollution through the production of fast fashion clothes. The increase in fast fashion clothes imports in South Africa has led to the closure of textile factories and consequent loss of jobs. Sustainable development is a pathway to reducing socio-environmental, cultural and economic harm. Sustainable processes and products create new employment. Fashion design entrepreneurs are often involved and have influence in every supply chain of their business and are thus in one of the best positions to implement sustainable fashion supply chain operations. This qualitative study aimed to investigate South African fashion design entrepreneurs' awareness and practices of sustainable fashion supply chain operations. Participants were selected purposively, and data was collected through semi-structured interviews. The results indicated that most of the participants were aware of sustainable fabrics through personal research. Half of them source and produce sustainable garments on a small scale due to the high price of sustainable fabrics. All the participants had limited knowledge of sustainable design methods. All the participants save their fabric offcuts, and only half of them are motivated by environmental concerns. Furthermore, the results indicated a lack of systems to manage the recycling of fabric offcuts. Given that there are few sustainable fashion design entrepreneurs in South Africa, the study recommends that textile and clothing industry leaders, especially sustainability practitioners, disseminate knowledge and training across the board on sustainable supply chain operations.

Keywords: Fashion design entrepreneurs, Sustainable supply chain operations, Sustainable fabric sourcing, Sustainable garment design, Sustainable garment manufacturing

Introduction

Entrepreneurship is linked to sustainable development because entrepreneurship contributes to innovation, generates employment, influences economic development, betters social issues and assists in dealing with environmental issues (UN, 2015). Sustainable operations in businesses entail those businesses integrating sustainable values into the creation of new merchandise (Zu, 2014) and reconsider their core processes and productions (Fisk, 2010). Given the fact that the textile and clothing industry (TCI) has contributed to the current socio-environmental challenges, fashion design entrepreneurs cannot afford to have sustainable operations as a separate element in their business. Sustainable operations ought to be at the core of their business. The inability to address socio-environmental challenges endangers businesses' capacity to build wealth and to be viable in the future (Zu, 2014,). Businesses that incorporate sustainable practices have a competitive advantage (Bomgardner, 2018). For the South African textile and clothing industry (SATCI) to be sustainable and improve its sustainability efforts, sustainable supply chain operations need to be integrated into business practices and processes to ensure and increase the production of sustainable clothes. South African Fashion Week (SAFW) is a platform for South African fashion designers

to showcase their work. May (2019) reports that SAFW has a record of 580 fashion designers. However, only a small number of fashion designers are socio-environmentally sustainable.

Within this research context, this study aimed to investigate South African fashion design entrepreneurs' awareness and practices of sustainable fashion supply chain operations. Table 1 presents the objectives of this study.

Table 1: Sub-aims of the study.

Sub-aim 1
Explore and describe fashion design entrepreneurs' awareness of sustainable fabrics and garment design methods
Sub-aim 2
Explore and describe how fashion design entrepreneurs balance economical sustainability and socio-environmental sustainability while sourcing fashion materials, designing garments and manufacturing garment
Sub-aim 3
Explore and describe fashion design entrepreneurs' current practices while sourcing fashion fabrics and manufacturing garments
Sub-aim 4
Explore and describe fashion design entrepreneurs' current practices towards economic sustainability in sourcing fashion materials, designing garments and manufacturing garments

Literature review

The emergence of sustainability has led numerous fashion businesses into altering their organisational approaches in their supply chain (Choi & Li, 2015; Shen, 2014). It is worth bearing in mind that altering supply chain operations is a gradual process. This requires fashion design entrepreneurs to evaluate their supply chain operations and identify gaps and opportunities where sustainable supply chain practices and processes can be integrated. This study focused on three stages of fashion supply chain: sourcing, design and manufacturing.

Sustainable fabric sourcing

Sustainable sourcing firstly involves sourcing sustainable fabrics and secondly sourcing locally manufactured fabrics. It is important to note that every fabric has its individual socio-environmental threats (Fletcher, 2014). Sustainable fabrics include organic cotton, recycled polyethylene terephthalate (rPET), wool, linen, hemp, Tencel or Lyocell and bamboo. Some of the sustainable fabrics that can be sourced in South Africa (SA) are cotton produced by the Sustainable Cotton Cluster (Cotton SA, 2016), rPET, linen hemp (Del Monte, 2021), wool, cashmere and mohair (Twyg, 2020). It is important to note that some of these fabrics are sometimes sourced in SA and processed outside the country and vice versa (Del Monte, 2021).

Sourcing locally is reasonably costed and sustainable because it benefits the country's economy through job creation, reduces shipping costs and reduces carbon emissions (Cadigan, 2014; Fontes, 2016; Ho & Choi, 2012; Sprague, 2015). Over previous years, leading retailers sourced fabrics and clothes from China, and this has negatively affected South African textile manufacturers' capacity (Daniel, 2022). Chinese imports

have weakened the South African textile, clothing, leather and footwear industries (SATCLF) (Mahlati, 2017). In 1996, the SATCI had about 1,600 clothing factories. In 2015, the industry had approximately 900 functional clothing factories (Reuters, 2015). The drop in the number of factories indicates the urgent need for South African retailers and fashion design entrepreneurs to source and manufacture locally to improve the economic well-being of the industry and society.

To date, leading retailers have committed to sourcing locally produced fabrics (Daniel, 2022). When large businesses boost the demand of sustainable fabrics, it will help boost production demand from smaller manufacturers and will make sustainable products more reasonably priced and enable customers to purchase more products (Lee, 2014). Sustainable fashion design entrepreneurs often struggle to find reasonably priced sustainable fabrics (Kawana, 2017; May, 2019). Given that the SATCI struggles with adequate mainstream fabric production for its market, it is logical that there would also be a shortage of sustainable fabric production. Thus, where sustainable fabrics are not readily available and are beyond the fashion design entrepreneur's financial capacity, purchasing sturdy polyester should be an alternative. Polyester is a controversial fabric because it is harmful to the environment, yet it is one of the two most used fabrics in the world (DeHaan, 2016; Fletcher, 2014). It is made from non-renewable resources and pollutes the environment (Niinimäki, 2013; Olajire, 2014). However, polyester manufacturing uses less water than cotton manufacturing (Fletcher, 2014), it is durable and has stronger fibres than cotton (Norway Geographical, 2019). The popularity of polyester, due to its affordability and other characteristics, makes it difficult to stop using this fabric completely. In the fashion supply chain, the sourcing stage is followed by the garment design stage.

Sustainable garment design

Sustainable garment design involves careful consideration of the type of fabric and its effects, the manufacturing, the customer-use phase and disposal of garments to reduce harmful global socio-environmental impacts (Zoltkowski, 2022). Sustainable garment design must consider, among others, "economic, social, and environmental values" (Niinimäki, 2013) and cultural values. Fashion design entrepreneurs determine the look of sustainable garments (Sherburne, 2009), as well as the processes and practices that the garment will experience. Fashion design entrepreneurs can use various methods to design sustainable garments, including, among others, zero-waste design methods, design for multifunctional garment design and design for emotional durability.

Zero-waste design methods do not separate the design stage from the manufacturing stage. Zero-waste design is a method of reducing fabric waste at the design stage by considering the cost of the fabric, balancing garment aesthetics, fit and cost and pattern cutting (Rissanen, 2013). Zero-waste design methods consist of and are not limited to draping, zero-waste pattern layout or jigsaw puzzle methods and subtraction pattern cutting (The Cutting Class, 2013; Ecochic Design Award, 2017). The jigsaw puzzle method refers to laying pattern pieces like a jigsaw puzzle to avoid fabric wastage (The Cutting Class, 2013). The subtraction pattern-cutting method is like the draping method in that both subtraction and draping require the fashion designer to "twist, displace, and feed the fabric back to itself" (The Cutting Class, 2013).

Multifunctional garment design – also known as transformable design and convertible design – involves designing a garment that can be reversible, consisting of various elements that can be added or removed by the wearer depending on the occasion or season (Li et al., 2018). Multifunctional garments provide customers with one garment that can be worn in multiple ways, with each look consisting of a different

aesthetic identity and function. It is possible to reduce customers' purchases of new fashion (Lang & Wei, 2019), extend the life cycle of a garment and thereby reduce the number of garments in landfills (Koo et al., 2014).

Emotional durability is a design concept that intends to create a long-lasting emotional connection between the garments and the users (Chapman, 2015). Involving customers at the garment design stage can contribute to creating an emotional bond with the garment (Durrani et al., 2016) and tackling consumption behaviour (Durrani et al., 2016). The sustainable garment design methods discussed above all focus on reducing fabric waste at either the pre-consumer or post-consumer phase. The garment design stage in the fashion supply chain is followed by the manufacturing stage.

Sustainable manufacturing

In this study, sustainable manufacturing refers to the treatment of fabrics at the pre-consumer phase and of garments at the post-consumer use phase. Fashion design entrepreneurs can employ various methods in the treatment of both fabrics and garments at the pre-consumer and post-consumer phases that can contribute to the sustainability of the TCI in SA. This study focuses on a closed loop approach consisting of reuse and recycling practices. According to Cuc and Vidovic (2011) and Holm (2013), reuse and recycling have environmental, social and economic benefits. The closed-loop approach, also known as the "circular economy", refers to the treatment within the clothing factory of fabric offcuts, waste fabrics and merchandise once the garment is no longer useful to the client (Niinimäki, 2013; Pervez, 2017). Given that the closed-loop approach seeks to reduce landfill and extend the life cycle of fabrics (Norwich University, 2020), it is important to note that this approach can be applied both to fabrics that are considered sustainable and those that are not considered sustainable.

Reusing and recycling are approaches conceived to reduce waste and require fashion design entrepreneurs to re-think their entire manufacturing processes and practices. Reuse approaches also involve reselling, renting and swapping (Hendriksz, 2016). In some cases, before garments can be reused, they need to be repaired, which means providing a repair service to customers. Renting clothes enables companies to increase their profit (Hendriksz, 2016). Recycling means modifying the original attributes of fabrics to make new items (Ho & Choi, 2012). One of the ways fashion design entrepreneurs can implement a closed-loop system is by encouraging customers to bring back their used and unwanted clothes. In addition, South African fashion design entrepreneurs can also practise product-centric recycling. Product-centric recycling means that clothing manufacturers recycle their own textile waste (Sherburne, 2009); this approach is intended to generate profit. In SA, the rising cost and limited access to landfill sites indicate the need for the SATCI to strengthen its reusing and recycling systems (Enviroserv, n.d). According to Hendriksz (2016), many overseas businesses and manufacturers join forces with their local governments to reduce carbon emissions, energy and water consumption, waste and their general environmental impacts. It is crucial that the South African government aids the SATCI in obtaining technologically advanced equipment to improve the industry's recycling capacity.

A few fashion design entrepreneurs identify themselves as sustainable. Furthermore, the current climate challenges facing the world and the state of the SATCI denote the need for more fashion design entrepreneurs to adopt sustainable supply chain operations.

Methodology

In this study, qualitative methods were used to explore and describe fashion design entrepreneurs' awareness and their current sustainable fashion supply chain practices. The six participants for this study were selected purposively based on the following four criteria:

1. Must produce clothes for men or women.
2. Must have been in business for at least three years.
3. Must have an online and a physical store
4. Must not be primarily producing sustainable clothes.

The data collection consisted of semi-structured interviews and analysis of documentation found on the participants' websites or social media pages and was conducted in 2020. Due to financial constraints, telephone interviews were conducted. The participants were informed ahead of time that the interview would be recorded. The interviews were recorded using the Another Call Recorder application. The semi-structured interviews were transcribed, coded, categorised and arranged for analysis (Babbie, 2016).

Credibility, dependability and confirmability were the categories used to maintain the trustworthiness of this study. Credibility was maintained by transcribing the recorded interviews, submitting the transcribed interviews to another researcher and by data triangulation. Evaluation of the data collection, data analysis, and interpretation was maintained through continual consultation and discussion with supervisors. This ensured that the dependability and confirmability of the data were maintained. The results and discussion are provided below.

Results and discussion

The findings of this study are discussed based on the sub-aims as shown in Table 1.

Fashion design entrepreneurs' awareness of sustainable fabrics and garment design methods

Regarding awareness of sustainable practices at the fabric sourcing stage, Participant C was the only participant who indicated that she is not aware of sustainable fabrics, stating, "I'm not clued up about sustainable fabrics, and I'll need to be educated more on their benefits. Smal (2016) pointed out that the local TCI is in the early stages of addressing sustainable practices, so there is not widespread awareness in the local TCI. This may explain why Participant C is not knowledgeable about sustainable fabrics. Participants A, B, D, E and F indicated that their knowledge on sustainable fabrics and their benefits was based on personal research. These participants revealed that they found sustainable fabrics to be more expensive than other fabrics. May (2019) and Kawana (2017) report that sustainable fabrics are indeed expensive. To make sustainable fabrics affordable to micro and small businesses, large retailers must continue to source these fabrics.

Regarding awareness of sustainable operations at the design stage, all the participants showed minimal awareness of various sustainable design methods. Participants B, D and F indicated they are conscious that reducing fabric offcuts is environmentally sustainable. Although Participants A, C and E save fabric offcuts, they were not aware that this is a sustainable design method, and their motivation for saving fabric offcuts was economic. Participant B indicated that he experiments with draping, and this is motivated by the plethora of style options that this method offers. Participant is the only participant who uses the design for emotional durability method. However, this participant is unaware of this terminology and that this

is a sustainable design method. This participant's motive for using this method is to increase sales. All the participants were unaware of the other three remaining sustainable design methods: zero-waste pattern layout, subtraction pattern cutting and multifunctional garment design.

Fashion design entrepreneurs balance economic sustainability and socio-environmental sustainability in sourcing, design and manufacturing

Regarding balancing environmental sustainability and profitability, Participants A, B, D, E and F indicated that environmental sustainability and economic sustainability are connected. Participant A indicated that making a profit while disregarding environmental sustainability is counterproductive. According to Brubaker (2015), entrepreneurs can fix catastrophes by innovating sustainable business models that can influence customers and increase profit. Participant D indicated that a designer must be able to solve problems and produce garments that bring in profit. Some of the participants concurred that balancing environmental sustainability and economic sustainability is a process that requires intentional development and time. Some of the methods that participants use to balance environmental sustainability and economic sustainability are reducing fabric waste, using waste for sellable products and producing garments based on orders only. Participant B stated that profit and environmental sustainability is a process that involves both research and collaboration with other professionals who are knowledgeable about environmental sustainability.

With regards to balancing social sustainability and economic sustainability, all the participants indicated that it is possible to balance these. Some of the methods that the participants use to balance social sustainability and economic sustainability are as follows:

- Intentionally producing garments that are affordable to the target market;
- Developing employees' skills through training workshops;
- Providing rent-free space in the retail store for emerging designers' products; and
- Providing factory space for employees' private clients on weekends.

Regarding balancing employees' salaries and social sustainability, three participants indicated that they pay their employees based on existing systems such as the Basic Employment Act, the Bargaining Council, the Companies Intellectual Property Commission (CIPC) and union regulations. One participant indicated that his employees are paid above the existing minimum wage standard. Two participants indicated that they use their standard based on the current cost of living in SA, the daily operational cost of the business, the level of employee work experience and overtime. Overall, the various avenues that the participants use to empower their employees demonstrate a value for human life and the services rendered by their employees.

Fashion design entrepreneurs' current socio-environmentally sustainable practices at the sourcing and manufacturing stages

Participants B, D and F source sustainable fabrics such as linen, sustainable cotton and wool on a small scale. These participants manufacture sustainable clothes on a small scale for their upper-class customers because most of their customers cannot afford the clothes. All the participants revealed that they manufacture their garments in-house. As mentioned, all participants in this study save their fabric offcuts. Participants A and C reuse their fabric offcuts to make accessories. The remaining four participants indicated that they donate their fabric offcuts to their employees, charity organisations and local

communities. Participants D and F indicated that there should be better systems to manage fabric offcuts. The participants are not always able to donate their fabric offcuts, which results in unused fabric offcuts filling up their studios, and these may end up in landfills. Participant F pointed out that as a small business, it is difficult to prepare fabric offcuts and garments for recycling due to a lack of recycling services in the area they operate in. This may suggest that there is a need for more accessible recycling services to streamline recycling for fashion design entrepreneurs.

This study found that garment reuse and renting are not common practice among the participants. Participant A reports redesigning and reusing garments that do not sell. Participant D reported that they occasionally rented runway garments and found that there is no market for renting clothes. This may suggest that fashion design entrepreneurs can initiate and build a renting culture among customers.

Fashion design entrepreneurs' current economically sustainable practices at the sourcing, design and manufacturing stages

Exploring participants' various economically sustainable practices in fashion supply-chain operations was the fourth sub-aim of this study. Economically sustainable practices in this study were threefold, namely sourcing locally manufactured fabrics, businesses making profit consecutively and overall economic contribution to the TCI. Several international authors Cadigan (2014), Ho and Choi (2012), Sprague (n.d.) and Fontes (2016) acknowledge that sourcing fabrics in the country where your business is situated is one way of improving the local economy. Participant A indicated that they source locally manufactured conventional cotton. Participant B indicated that the socio-environmentally friendly cotton and hemp they source are manufactured locally. Based on participant C's website, some of their African print fabrics are produced by South African fabric manufacturers. Participant F sources linen and conventional cotton in SA. Participants D and F pointed out that the industry needs more textile mills to increase local production. In addition, Participant D indicated that they source wool fibres locally, and the fibres are then sent overseas to be woven and finally imported back to SA. Thus, more wool and leather mills are needed in SA to increase the local TCI production capacity, reduce pollution incurred in shipping and alleviate poverty by providing jobs.

Participants B, C, D, E and F source their synthetic fabrics from South African wholesalers who stock imported fabrics. These findings suggest that imported fabrics are readily available in SA and that there are not enough fabric factories to cater to local demand. Importation of fabrics is not economically friendly because it does not benefit the local TCI and the country and impedes the growth of textile and clothing factories. Given that the SATCI has few textile factories, it is understandable that the fabrics that participants source are often imported. Although South African fabric wholesalers may employ a few people, the countries that produce these fabrics have greater economic benefits (in terms of fabric production), good production capacity for their TCI and employment opportunities for their local communities.

With regards to consistently making a profit, participants A, B, C and F revealed that they have been consistently making a profit, and this has allowed them to remain in business. Participant F indicated that having multiple businesses in one location is one of the ways he manages financially. This may suggest that for some small and medium enterprises, it may be necessary for them to expand their services to deal with tougher business seasons. Participants D and E indicated that they were only able to make a profit after three years, and this was due to assistance from a business rescue specialist. Both participants highlighted

the importance of business skills in managing a business. This suggests that without the right sets of business skills, it is difficult to remain sustainable and make a positive contribution to the local TCI and the country. Regarding economic contributions to the TCI, all the participants in this study indicated they are making an economic contribution to the TCI because they manufacture their garments locally.

Conclusion and recommendations

This study has revealed that fashion design entrepreneurs incorporate minimal sustainable practices in one to two stages of their supply chain operations. The minimal sustainable practices are not solely motivated by the desire to contribute to a sustainable TCI and reduce socio-environmental harm. Regarding sourcing, the study revealed that there is a need to educate fashion design entrepreneurs on sustainable fabrics and where to source them. Sustainable fabric manufacturers and stockists need to be visible in the marketplace, as this will further increase awareness and purchases of the fabrics. The data uncovered the knowledge and skills gap at the garment design stage. It is crucial to empower fashion design entrepreneurs with sustainable garment design knowledge and skills training in the advancement of a sustainable SATCI. Sustainable design methods may increase the quantity and variety of sustainable clothes in the South African retail environment and provide customers with more options. The participants in this study have shown that saving fabric offcuts for reuse and donation is a widespread practice while renting and redesigning garments is rare. Garment renting, repair and redesigning are sustainable manufacturing methods that can decrease clothing consumption and the production of new fabric and reduce landfills. The findings of this study reveal that there is a need to promote garment renting and repair among fashion design entrepreneurs and customers. Additionally, fashion design entrepreneurs can practise sustainable manufacturing by redesigning garments that do not sell or by donating them to charitable organisations. Incorporating minimal sustainable practices and processes in one or two stages of the supply chain operations is a starting point towards building a sustainable TCI. For fashion design entrepreneurs to increase their sustainable contribution to the industry, moderate to maximum sustainable practices and processes need to be implemented at every stage of supply chain operations.

This study had a limited criterion. First, we suggest that future research should include clear target market criteria (upper class, middle class and lower class). Second, future studies should have an equal number of participants who have been operating for the same number of years. Participant B stated that sustainability is a journey that takes years to implement. It can be deduced that as a business progresses, there are unique supply-chain operations that must be modified, adapted and preserved accordingly. Third, a longitudinal study will provide in-depth insight into methods that fashion design entrepreneurs can use to transform their businesses in a sustainable manner. In conclusion, this study is not representative of the entire South African TCI. This study offers valuable insight into the current practice of micro- to-small businesses of mainstream fashion design entrepreneurs' sourcing, designing and manufacturing operations.

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