

Design Innovation Challenges and Coping Strategies of Sustainable Apparel Product Development among Fashion Designers in Uyo, Nigeria

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Abstract

The purpose of this study was to examine the design innovation challenges encountered in the process of sustainable apparel product development and the strategies adopted by the fashion designers to cope with the challenges. One research question and one hypothesis guided the study. Using a descriptive survey design, convenient sampling technique was used to select 49 out of 117 fashion designers in Uyo. Simple percentages, means and t-test were the statistical tools adopted to analyse the obtained data. The results of the study showed that challenges in the course of sustainable apparel product development are actually encountered by fashion designers in Uyo at the designing stage ($x = 3.37$). The statistical differences between the strategies adopted by male and female fashion designers to cope with sustainable apparel product development was not significant for design innovation challenges ($t_{\text{calc}} = 0.56$, $t_{\text{crit}} = 1.68$, $P < 0.05$). The findings of the study also revealed that application of the appropriate strategies to cope with apparel product development challenges enhances sustainable production turnover. It was recommended that challenges encountered in the process of apparel design innovation are necessary to harness the capacity of the Fashion designers to sustainably develop apparel products which will satisfy the consumers and as well gain widespread acceptance.

Keywords: design innovation, sustainable apparel, coping strategies, capacity building, fashion designers

INTRODUCTION

Today in this consumer-based society, clothing has become an indispensable part of human lifestyle and apparel product development has become a vital sector that contributes positively to the social and outward personality development of the people. The globalization of apparel manufacturing and shortening of development time has led to the evolution of the different roles within product development. Developing competitive products require a mix of strategy, teamwork and utilization of the right tools. The best practices to create this type of working environment are implemented and continually updated at many leading companies.

Fashion designers who are key players in apparel products are faced with diverse challenges due to rapidly changing fashion cycles, knowledgeable consumers, and rigorous competition and are being driven to more efficiently methods of apparel development (Wickett, Gaskill and Damhorst, 1999). As a result, apparel developers must remain agile to compete and be successful in today's market environment. One way to enhance apparel designers' agility is to assess the challenges encountered in the

development process and the various coping strategies in order to suggest more appropriate strategies for improvement. The designer must evaluate the needs of all stakeholders to determine how to proceed with a design concept and make choices according to the risks and benefits (Howarth and Hadfield, 2006). Klepp (2003) postulated that fashion designers should seek for quality management, which determines the sustainability of fashion business. They should not just design anything; they have to design something that they know will catch the consumer's eyes for sustainability.

According to Kogg (2003), the processes or activities of apparel product development requires that every apparel designer experiences some challenges in one stage or the other, some of which include; technological, timing, resources, perceived value, quality standard, supply capacity, material cost and pricing and design innovation. It is significant to note that encountered challenges are not surfaced to decline or stop the product development of apparel but to motivate the designer to look for alternative direction for improving production in the fashion industry. This demands that

apparel designers should have a positive optimism and develop a positive attitude towards the challenges in order to develop confidence and determination for possible solutions suggestions towards sustainable product development, hence this study.

Mentzer *et al.*, (2001) deduced that the challenge of product development involves the effective selection of distribution agents or more entities that will directly and indirectly be involved in upstream and downstream flows of apparel products and services. Moreover, effective sustainable product development exists as a result of a firm's strategic commitment and orientation towards production. Mentzer *et al.*, (2001) asserted that effective and sound selection of distribution channel or supply chain depends on sustainable apparel products and service development. This however forms the major challenge of consumption which is the final stage of apparel product success (Mentzer *et al.*, 2001). Gam and Banning (2011) suggested that apparel product designers also face the challenge of product distribution. It was posited that heightened creativity and design innovation strategies can be employed by apparel designers to cope with design innovation challenges. They further affirmed that the production challenges can be coped with the application of system-based-thinking defining the problem.

In Uyo, preliminary investigations revealed that the clothing sector has been experiencing a tremendous slow-down in operation probably due to poor acceptance of innovative designs by the consumers, inadequate man power, scarcity and high cost of materials, poor technological support, poor production quality, lack of sufficient distribution channels and inability to satisfy consumers. This creates an illusion that the fashion designers in Uyo cannot compete with their counterparts outside the state in apparel products development. These problems caused many of the fashion designers to fold up probably due to their inability to cope with the challenges sustainably in the course of their apparel products development. Therefore, this study sought to investigate the challenges and coping strategies encountered by the fashion designers at the designing and production stages of sustainable apparel product development in Uyo.

PURPOSE OF THE STUDY

The main aim of the study was to investigate the challenges and coping strategies encountered by the fashion designers at the designing stage of sustainable apparel product development in Uyo. Specifically, the study sought to:

- i) Identify the design innovation challenges faced by fashion designers in sustainable apparel product development.
- ii) Examine the strategies adopted by fashion designers to cope with design innovation challenges.

RESEARCH QUESTIONS

- i) What are the design innovations and production challenges encountered by fashion designers in sustainable apparel product development.
- ii) What are the strategies adopted by fashion designers to cope with design innovation and production challenges faced by fashion designers in sustainable apparel product development.

HYPOTHESIS

H₀₁: There is no significant difference in the mean responses of male and female fashion designers on the strategies adopted to cope with design innovation challenges

REVIEW OF LITERATURE

Apparel Product Development

Apparel product development is the creation and realization of a garment and clothing from its initial concept to its scale of consumption (Kogg, 2003). It involves the entire process from concept to delivering from style creation through garment specification, production, transportation, to final on-floor selling to consumers. Product development is done mainly by businesses in order to satisfy a new to be established customer want or a market niche. Brezet and Van (1997) describes that apparel product development can be tangible for example a physical product or it can be intangible which would mean for example a service that is being offered. There are many things to consider when developing a new product, for example how would the company turn the idea into a product, how to overcome technical challenges and how to market the idea and make everyone in the society aware of the product.

Effective sustainable product development exists as a result of a firm's strategic commitment and orientation toward sustainability. Systems-based thinking is required for implementing a sustainable design process and sustainability must underlie the ethos of the organization before designers can take action (Hong, Kwon, and Roh, 2009). A sustainable design effort that is analytical in defining the problem, innovative in its exploration of potential solutions, and practical in implementing them, is more likely to be successful when it is a result of an organization's strategic green orientation.

Design Innovation

The design stages of the product development process have a direct influence over the final product as this is where the most critical decisions are made, including cost, appearance, materials selection, innovation, performance and quality (Bhamra and Lofthouse, 2007). At this stage, the designer must evaluate the needs of all stakeholders to determine how to proceed with a design concept and make choices according to the risks and benefits (Howarth and Hadfield, 2006). For instance, design choices about cost and aesthetics influence sales while choices about disassembly or re-usability are linked to recovery operations. A product development process integrating sustainability issues requires modifications from traditional practices. Systems-based thinking is required for implementing a sustainable design process and sustainability must underlie the ethos of the organization before designers can take action (Hong, Kwon, and Roh, 2009).

Research suggests that sustainable design requires an integrative approach using the expertise of wide variety of organizational actors who cooperate to develop a product with internal alignment between designers, merchandisers, business strategists, production teams, marketing staff, end of life managers, and corporate responsibility managers to align sustainable options with customer value (Hong *et al.*, 2009). A philosophy that originated in the engineering field, integrative product design underscores the importance of multidisciplinary teams and cross-functional organizations (White, 2008).

Apparel Design Innovation Challenges

One of the challenges is that even though the process is user orientated, the information from users will be intermediated through research to the designers. As a designer, there are several options to approach the problem of reducing environmental impacts of clothing, but the theme is complex and an improvement in one area has a potential for impairing another. Disposable clothing then seems to be a perfect solution as the need for laundering would be completely removed. This would however increase the impacts from production, processing, and distribution (Fletcher and Goggin, 2001). Material selection has consequences for how the products are to be washed, and therefore has a potential for saving energy. However, if this is not communicated to the user or if the user does not want to follow the recommendation, the potential saving is lost.

Coping Strategies in Sustainable Apparel Design Innovation

Fletcher and Goggin (2001) described some coping strategies for apparel design innovation to include

quality management and control, competent designs, innovative design and use of current technology.

Quality Management and Control

Klepp (2003) postulated that fashion designers should seek for quality management, which determines the sustainability of fashion business. They should not just design anything; they have to design something that they know will catch the consumer's eyes for sustainability. Designers have to know what the new trends are and they have to know the change day to day in order to design what the customers' needs are. Clothing designers need to put so much work into their clothing design. Often times, people just buy a certain piece of clothing because it is what everybody else is wearing and it is the new fad without considering the quality of the product. They really do not respect the time and effort the designer has put into the design, even more so they buy them just for the label associated with the article of the clothing. All these things the fashion designers have to understand and try to master to become successful in the apparel industry.

The Use of Current Technology

Application of designed machine and equipment can facilitate garment design and fabrication. Most of the fashion designers in Nigerian communities are not using the latest technologies and machines to achieve best clothing design need of the consumers. Because most of the fashion designers are not technically inclined, it becomes difficult for the design companies to excel in their original perceived design apparel (Hethorn and Ulasewicz (2008).

May-Plumlee and Kenkare (2005) purport virtual design technologies such as product visualization, virtual fit, electronic communication, and networking can potentially reduce waste and maximize design. By working alternately in a 2D textile design environment and a 3D virtual product environment, the designer can create and evaluate textile and product designs without the cumbersome process of sampling and approving each step along the way. Such technology has the potential of reducing fabric usage while enhancing communication among stakeholders. There is some concern about achieving a seamless interface between technologies, the cost of implementing them, and the fact that users may miss the tactile interaction with the fabrics.

METHODS

This study employed descriptive survey research design. It was conducted in Uyo, Nigeria. The population of the study was made up of all the registered practicing fashion designers who are registered with both the

National Directorate of employment, and Ministry of Commerce and Industry, Uyo. The total number of persons was 117 at the time of the study. Purposive sampling technique was adopted for the study to select 49 respondents which represents 41.9% of the entire study population. This technique was suitable because of accessibility, availability and experience of the study participants.

A structured questionnaire known as C-CSSAPROD was face-validated by 5 experts and used for data collection. This was a 20-item instrument that was used by the researcher to elicit responses from apparel designers on challenges and coping strategies of sustaining apparel development. It was a 4-point rating scale to indicate the level of agreement among respondents on the questionnaire items. Test retest reliability was used to determine the internal consistency of the instrument. It was 0.82 at the first instance and 0.85 when re-examined. The research question was answered using means and standard

deviation while the hypothesis was tested using t-test at 0.05 level of significance.

Each of the respondents was given a questionnaire to tick the appropriate alternatives in the spaces provided. Necessary explanations were made to guide the respondents. After this, the respondents were allowed ample time to respond to the items on the questionnaire. Questionnaires were collected back after completion.

In order to score the instrument a key was developed where all the information obtained from the questionnaire was scored. Section A did not require any scoring. The respondents' reactions to each of the items in sections B and C were scored as follows:

Strongly Agree (SA) -4, Agree (A) - 3, Disagree (D) - 2, Strongly Disagree (SD) -1

The research question was analysed using means and standard deviation. The hypothesis was tested at 0.05 level of significance using related t-test

Table 1 Mean Scores of Respondents on Apparel Design Innovation challenges

S/N	Statements	Mean Score	Standard Dev.	Remarks
1	Fashion designers do not invest in new technology e.g Computer Aided Design	3.86	0.35	High
2	Fashion designers are faced with shortage of expertise, skill and vision to promote the apparel design sector.	2.84	0.91	High
3	There is lack of governmental support to invest in new fashion discovery.	3.92	0.27	High
4	Fashion designers lack design catalogues	1.35	0.71	Low
5	Fashion designers are faced with the problem of specialization in apparel product line.	3.93	0.26	High
6	Fashion designers do not design clothes for people considering their dreams and their situations.	3.78	0.42	High
7	Fashion designers do not design clothes to meet global standards.	2.60	1.19	High
8	Fashion designers are not positioned centrally in economic and business model.	3.88	0.32	High
9	Designs from fashion designers are not positioned centrally in economic and business model.	3.80	0.40	High
10	In designing management process clothes do not build in regenerative benefits for people and environment.	3.73	0.45	High
Average		3.37	0.53	

From Table 1, the mean Scores of respondents on apparel design innovation challenges show that Lack of specialization of fashion designers in apparel product line, lack of governmental support to invest in new fashion discovery, inability of the fashion designers to be positioned centrally in economic and business model and inability of the fashion designers to invest in new technology were the most widely accepted apparel design innovation challenges with mean scores of 3.93, 3.92, 3.88 and 3.82 respectively. Lack of design catalogues ranked the least accepted challenge with a mean score of 1.35. The results imply that fashion designers in Uyo have design catalogues which remains an age-long design chart for apparel design. Their

inability to augment to the current technological design such as the use of Computer Aided Design (CAD) is cost implicating thereby, placing the fashion designers in a disadvantaged position to adopting new technologies in design innovation.

From Table 2, the mean Scores of respondents on strategies adopted to cope with apparel design innovation challenges show that fashion designers undergo training on the application of new technology in the designing process (mean score = 3.92), they try hard to employ competent designers (mean score = 3.84) and they design clothes for corporate profit (mean score = 3.82). This implies that in attempt to overcome

design innovation challenges, fashion designers in Uyo have to train and retrain themselves through formal and informal capacity building initiatives. This is however cost implicating leading to their increase in service

charges to cater for the excess expenditure incurred in the training process.

Table 2 Mean Scores of Respondents on strategies adopted to cope with Apparel Innovation Challenges

S/N	Statements	Mean Score	Standard Dev.	Remarks
1	Fashion designers work hard to maintain good quality management and control.	3.75	0.54	High
2	Fashion designers try hard to employ competent designers	3.84	0.36	High
3	Fashion designers undergo training on the application of new technology in apparel design	3.92	0.37	High
4	Fashion designers put effort in hiring skilled personnel in order to improve the quality of the design.	1.35	0.71	Low
5	Fashion designers ensure the use of design catalogues	3.93	0.26	High
6	Fashion designers design clothes for people considering their dreams and their situations.	1.87	0.75	Low
7	Designs by fashion designers must be created locally and shared globally.	3.76	0.43	High
8	Fashion designers design clothes for corporate profit rather than society's good.	3.82	0.38	High
9	Design from fashion designers must be positioned centrally in economic and business model.	1.97	0.65	Low
10	In designing management process clothes must be built in regenerative benefits for people and the environment.	3.43	0.50	High
Average		3.17	0.50	

HYPOTHESIS

H₀: There is no significant difference in the mean responses of male and female fashion designers on the strategies adopted to cope with design innovation challenges

From the analysis of items 11 to 20 of the research instrument consisting of the strategies adopted by fashion designers to cope with design innovation challenges, Table 3 presents a summary of the t-test analysis of the mean scores of male and female respondents. As shown in Table 3, the calculated t-value (0.56) is **less** than the critical value (1.68); hence, the null hypothesis (H₀) of no significant difference between the mean scores of male and female fashion designers on strategies adopted to cope with innovation challenges is **accepted**. This implies that there is no significant difference between the strategies adopted by male and female fashion designers to cope with design innovation challenges.

Table 3: t-test Analysis of the mean scores of male and female fashion designers on strategies adopted to cope with innovation challenges

Variables	Mean	Var.	N	df	t _{calc}	t _{crit}	Remark
Male	3.48	0.03	21	47	0.56	1.68	Not Significant
Female	3.45	0.04	28				

P < 0.05

DISCUSSION OF FINDINGS

The results of the study has revealed that challenges in the course of apparel product development are faced by fashion designers in Uyo at designing, material sourcing, production and product distribution stages.

This agrees with the findings of Kogg (2003) that the processes or activities of apparel product development requires that every apparel designer experiences some challenges in one stage or the other, some of which include design innovation technological, timing, resources, perceived value, quality standard, supply capacity, material cost and pricing.

The results of the study have revealed that the fashion designers in Uyo adopted diverse strategies to cope with challenges encountered in the process of apparel products development. This was evidenced by the mean scores of their responses which were above a cut-off mark of 50% for strategies adopted to cope with design innovation, material sourcing, apparel production, distribution and consumption challenges. This agrees with the findings of Mentzer *et al* (2001) that effective and sound selection of distribution channel or supply chain depends on sustainable apparel products and service development. This however forms the major challenge of consumption which is the final stage of apparel product success (Mentzer *et al.*, 2001).

The results showed that female fashion designers scored less than the male counterparts in their responses to the adoption of coping strategies against design innovation challenges, material sourcing challenges, production challenges and product consumption challenges. This can be attributed to values of the feminine gender which seeks to be naturally reserved thereby not ready to take the risks (financial and stress-related) involved in search of materials and production utilities which guarantee product consumption. The complexity in respect to apparel product acceptance is however low with the female gender such that adopting strategies to cope with design innovations was not a difficult task with female fashion designers since they (females) subscribe to multiple designs and apparel products when compared with the male folks.

Implications For Capacity Building Initiative And Wealth Creation In Apparel Product Development

It is noticeable that building the capacity for sustainability in the apparel design sector is key task of the apparel design programme and must be based on changing human activities (Thompson, 2014). Significantly, a visionary education system with sustainability and capacity building at its heart, producing designers who can use their creativity as a tool for communication together with a holistic interdisciplinary approach is vital to achieve all these tasks (UNESCO, 2002; Centre for Sustainable Fashion, 2009). It is totally agreed with Jones (Jones, 2008) that if design education is to fulfil its potential as an agent of change towards a more sustainable society, sufficient attention must be given to it as the subject of change. Curricula design for this purpose therefore should enable teachers to plan learning experiences that empower their students to develop and evaluate alternative visions of a sustainable future in apparel product design and to work creatively with other disciplines to help bring their visions into effect (UNESCO, 2002). According to Thompson (2014), as teaching of sustainability is comparatively new in Nigeria, the implementation of creative, innovative and sustainable training programmes will be an important part of building capacity for a sustainable future in textiles and apparel design.

CONCLUSION

Challenges in the course of apparel product development are faced by fashion designers in Uyo at designing, material sourcing, production and product distribution stages. Fashion designers in Uyo adopt strategies like the use of computer aided design and catalogues to cope with design innovation challenges.

The findings of the study has revealed that application of the appropriate strategies to cope with apparel product development challenges enhances sustainable production turnover, as such, challenges encountered in the process of apparel product development is necessary to harness the skills of the Fashion designers to sustainably develop apparel products which will satisfy the consumers and as well gain widespread acceptance. Thus, the following recommendations are made:

1. Designers should engage in sustainable designs to cater for the needs of consumers both now and in the future.
2. Fashion designers should be involved in sustainable designs so as to stay competitive in the global apparel market.
3. The government should encourage fashion fairs among indigenous designer's cooperative societies in Akwa Ibom State so as to encourage innovations in apparel initiatives.
4. The government and some private establishment should encourage capacity building initiatives among fashion designers and researchers.
5. Both government and private sector should sponsor proposals in entrepreneurship development in the apparel design sector.

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