

Sustainability in Fashion and Textiles Education: A Classroom Project Approach

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Abstract

In the 21st century, sustainable development has become the focus area for businesses and industries, especially the fashion and textile industry, which is largely responsible for causing harm to the planet and eco-system. The fast fashion business model has fostered overconsumption habits, leading to a huge amount of waste generation, thus impacting the environment, health, and well-being of people. Therefore, it is imperative for the fashion industry to plan sustainable business strategies that regenerate the environment, support ethical practices, and yet support economic growth.

Sustainable development can be achieved only through the efforts of designers, manufacturers, retailers, organizations, academia, and government, and by building consumer awareness. Fashion institutes nurturing professionals for the industry should take up the responsibility to integrate sustainability into their curriculum and impart training to develop competent individuals who can drive effective sustainable models in the industry. UNESCO's Education for Sustainable Development (ESD) for 2030 endeavors to empower individuals to make informed decisions and collectively change society and protect the planet. To inculcate an effective understanding of sustainability, the pedagogical approach in ESD entails interactive, engaging, and experiential training for learners.

This research examines a case study where a real-time project was integrated into the Surface Design Project module for third-year textile design students. The objective was to impart understanding of sustainability through project-based learning with continuous feedback from the industry. The pedagogy and subject deliverables were restructured based on the education for sustainable development (ESD) framework. Through this study, the researchers assessed the impact of the project on students' understanding and application of sustainable practices to achieve surface designs. Following completion of the project, an assessment was conducted by subject faculty and the industry sponsor, and a structured questionnaire was distributed to the students

to solicit their feedback. The findings demonstrate the relevance of an industry-linked classroom project that significantly enhanced the students' learning and experience in the domain of sustainable design.

Keywords: Sustainability, classroom project, pedagogy, industry collaboration, experiential learning

Introduction

The fashion industry is one of the most significant industries in the world, with a noteworthy contribution to the global economy. According to Statista (2021), the total consumer spending on apparel and footwear globally is estimated to reach 2,571,939.42 million USD by 2025. The ever-growing textile and apparel industry is mainly blamed for causing ecological disturbance due to excessive use of resources, chemicals, and mounting landfills. Preuit and Yan (2017) state overconsumption of clothing as a major concern, which drives businesses to manufacture more and more products, thus pushing consumers to purchase new items and discard older clothes while they are still wearable. The growing population and increasing pressure on Earth and its natural resources are serious concerns that require immediate attention towards sustainability.

Sustainable fashion is a widely used term in today's world, gaining the attention of all stakeholders, including industry, governments, academia, and consumers. Though there are several conversations revolving around fashion sustainability, there is limited conceptual understanding; therefore, terms like eco-friendly, green fashion, organic, biodegradable, or zero-waste fashion are used interchangeably. The term 'sustainability' is used in the context of both environmental and social concerns; thus, sustainable fashion encompasses ethical fashion as well as eco-fashion (Payne, 2018).

Shen and Sethi (2021) are of the view that over the years there has been a lot of discussion about making the fashion industry sustainable, but sadly, sustainability efforts have declined. The fashion industry has a commercial approach that entails quick design solutions to cater to the market, thus making it challenging for designers to reflect on the environmental impact and ethical sourcing while designing products (Smal, 2014). Mora, Rocamora and Volonte (2014) explain the difficulty of making fashion sustainable due to the complex textile supply chain from farming to retail, where each step contributes to damage to the environment or the health and wellbeing of the workers. The biggest challenge for the fashion industry would be to balance sustainable fashion production with consumer preference for a wider range of affordable products (Gong, 2014).

According to trend forecaster Geraldine Wharry, as cited in the BOF & Mckinsey 2022 report, there exists a wide spectrum of consumption patterns, ranging from rising ultra-fast fashion consumption to the conscious consumer. However, she predicts a change in the future where mindful consumers may try to connect their purchases with their impact on society, while others might make an effort to recycle and reuse their possessions. To bring about a change, sustainability needs to be an integral part of fashion education in order to train environmental thinkers, socially responsible professionals, and conscious consumers. According to Armstrong and LeHew (2013), there is a huge responsibility on education to respond in order to prepare 'sustainability-minded change agents' who will lead the way to develop and evolve strategies for green fashion. Morrish (2017) elucidates the urgent need to educate learners and prepare them to adapt and embrace change within their practice, responding to social, economic, cultural, political, and environmental factors. A study by Onur (2020) affirms that design education can be an important means to develop an ethical fashion structure when its values and principles are reinforced by responsible and conscious individuals.

Education for Sustainable Development (ESD), conceived by UNESCO, addresses global challenges like global warming, decreasing biodiversity, rampant use of resources, and inequality. The collective action of humans has modified the planet's ecosystems, leading to severe consequences. ESD endeavors to provide learners with knowledge, skills, and values to make informed choices and decisions and nurture the planet for a better future. The ESD framework encourages the integration of sustainability issues into all types of learning through project-based, interactive, and learner-centric pedagogy. The objective is to empower learners to be responsible for the present and future generations for a dynamic 'societal transformation', thus building a more sustainable planet (UNESCO, 2020). Previous studies indicate the integration of the ESD framework in the fashion and textiles curriculum for effective learning and application of sustainable practices. A case study conducted by Armstrong and LeHew (2013) describes the holistic application of ESD in an apparel product development course that enhanced the students' learning experience. Lim (2020) presents another case study on practice-based learning through a zero-waste fashion design module conducted with Fashion Design students of Birmingham City University that augmented students' understanding about sustainable fashion and manufacturing.

Project Implementation

The classroom project was undertaken as part of the Surface Design Project subject with third-year students of the Textile Design Department at the National Institute of Fashion Technology (NIFT), New Delhi. This project was sponsored by the Centre of Excellence for Khadi¹ under the aegis of Khadi and Village Industries Commission,

Ministry of MSME, in association with NIFT. The project brief entailed an in-depth study of Khadi as a material, an understanding of sustainable practices, and following the same to develop creative surfaces on Khadi for designing home and apparel collections. Prior to the project, students were aware of the value-addition on fabric and equipped with surface ornamentation skills, including embroidery, resist-dyeing, printing styles and methods, and different fabric manipulation techniques.

Methodology

The main objective of the study was to assess the students' learning and application of sustainable practices to attain the deliverables of the design project. The central research question revolved around students' experience during the implementation of the project and the impact of a real-time sustainable design project on the overall learning outcomes. To conduct the research, a qualitative case study approach was most appropriate in order to conduct an in-depth, detailed analysis of a group of students within a realistic situation. The sample included a total of 39 third-year Textile Design students: 17 Textile Design students with a specialization in apparel and fashion accessories and 22 Textile Design students with a specialization in home and spaces. The key learning outcomes envisaged were an understanding of Khadi as a material and the application of sustainable design concepts for design developments.

The pedagogical framework followed is depicted in Figure 1. The project started with an introduction to the project brief and a session by the CoEK design team on Khadi as a sustainable fabric and the sustainable approaches followed by the Center. The entire class was divided into smaller groups (5 to 6 students per group) to conduct a market survey on Khadi fabrics and products through e-commerce platforms and physical stores run by KVIC in Delhi and NCR. The second assignment entailed a study of apparel and home textile brands that practice and apply sustainable design methods to their end products.

As part of the project brief, CoEK had assigned three India-centric themes to the class. The students were divided into three groups to brainstorm on the theme and develop research boards. This was followed by the development of the inspiration board, technique and trim board, look board, and client board by each student. Further, based on the design direction, creative surfaces were developed using sustainable methods and techniques.

To gauge the students' experience and understanding of sustainable design and practices post-project, a structured questionnaire comprising closed-ended and open-ended questions was developed. The link to the questionnaire prepared on Google Forms was shared with all 39 students who participated in the project. The close-ended questions

were measured using a 5-point Likert-type scale ranging from strongly disagree (1) to strongly agree (5). Questions related to students’ learning about sustainability and their views about the project experience and outcomes were incorporated to analyze the impact of the industry-linked classroom project. The personal information, including student names, was not asked for in the questionnaire in order to illicit an honest response from the students. Further, students were also informed regarding maintaining confidentiality about their identities and comments.

The study employed a mixed-methods approach combining quantitative and qualitative data analysis. The close-ended responses obtained from the questionnaire were analyzed using descriptive statistics, and the open-ended questions were analyzed using content and narrative analysis. Both quantitative and qualitative data were interpreted to conclude the findings. According to Chandrasekaran and Al-Ameri (2016), assessment of a project is the method of reviewing, interpreting, and making judgments about students’ learning. The researchers also took into consideration the evaluation of students’ design developments and feedback from the client (CoEK) following the completion of the project.

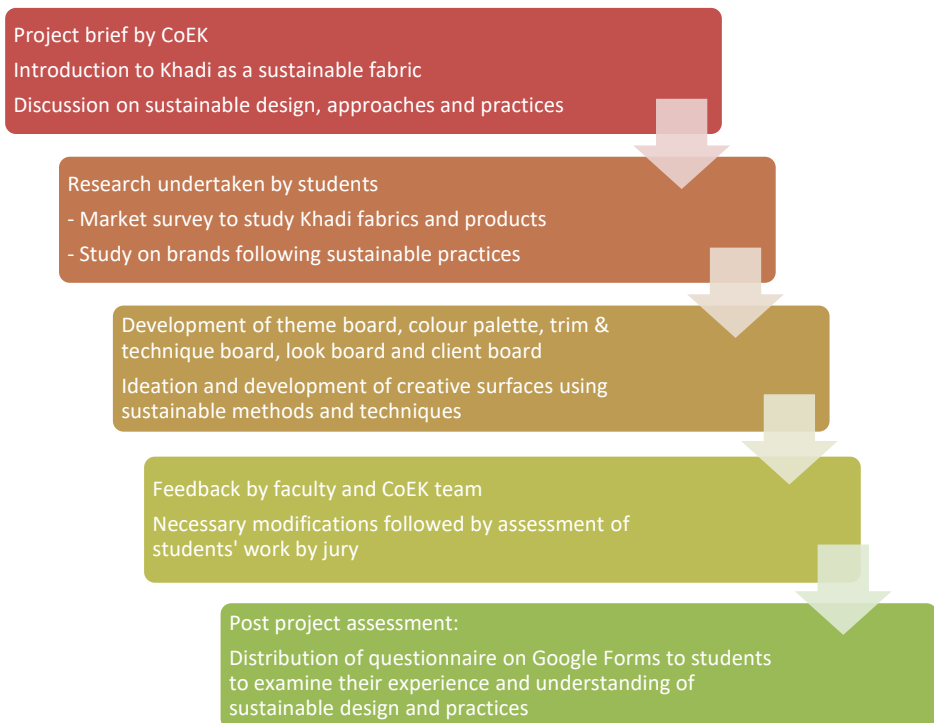


Figure 1: Framework of the industry-linked project and assessment

Results

The following findings are based on the student responses obtained from the questionnaire. Responses were received from 32 students. The questionnaire was structured to assess the students' understanding of sustainability and practical application to achieve value addition on Khadi. The questions were also framed to ascertain the impact of a live industry-linked project in comparison to other hypothetical design projects. The close-ended questions were formulated as statements that were measured using a 5-point Likert-type scale.

To gauge their understanding of sustainability, students were asked if they were aware of sustainable design and its approaches prior to the project. It was observed that 46.9 percent of students strongly agreed, and 37.5 percent were in agreement that they were aware of sustainable fashion concepts even before the project was introduced (Figure 2). The finding indicates that the majority of the students were familiar with the concepts and principles of sustainable design.

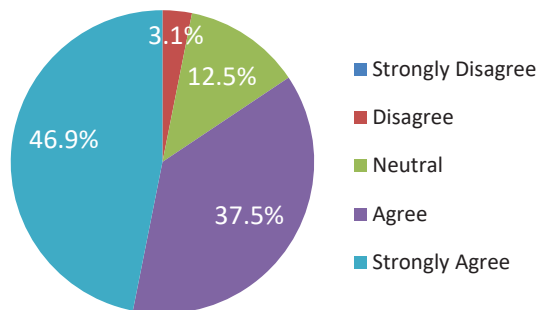


Figure 2: Response to 'I was aware about sustainable design and its approaches even before the project was introduced'

The respondents were asked if the classroom project increased their knowledge and understanding of sustainable design and practices. 46.9 percent of the class strongly agreed that the classroom project enhanced their knowledge regarding sustainable practices, and 37.5 percent of the respondents agreed with the statement (Figure 3). It can be observed that for most of the students, the classroom project provided an opportunity to broaden their perspective on the subject of sustainability.

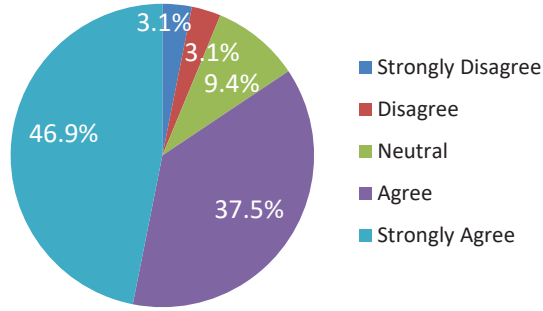


Figure 3: Response to ‘The classroom project enhanced my learning about sustainable design and practices’

One of the learning outcomes of the project was to develop an understanding of Khadi as a fabric and its relevance as a sustainable material of national importance. It was noticed that 65.6 percent of the respondents strongly agreed, and 25 percent concurred with the statement that their knowledge about the Khadi fabric had expanded while doing the classroom project (Figure 4). The data demonstrates that the classroom project served as a catalyst to provide deeper insights and appreciation for the traditional Khadi fabric to the students.

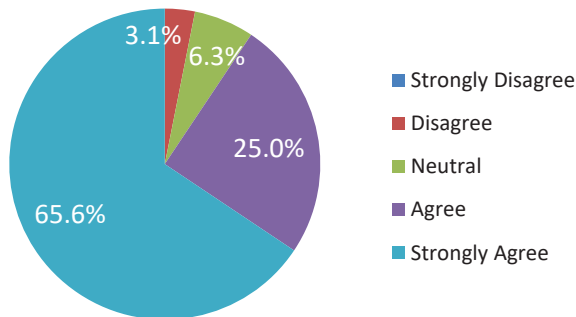


Figure 4: Response to ‘The project increased my knowledge about Khadi fabric’

It was important to determine if the project helped students use sustainable methods for designing and developing the surface swatches. Figure 5 depicts that half of the class strongly agreed, and another 28.1 percent were in consensus that the classroom project assisted them in employing sustainable processes for designing creative textile surfaces. The findings reveal the significance of the hands-on project that assisted students to learn and imbibe different techniques for sustainable development of value-added Khadi samples.

The participants were asked if the application of sustainable techniques and practices enhanced their creative design process during the project. 37.5 percent of the class strongly agreed and another 37.5 percent agreed with the statement, while 21.9 percent were neutral on the statement (Figure 6). The data reveals that 75 percent of the class was of the view that sustainable methods and practices augmented their creative thinking and design process during the classroom project.

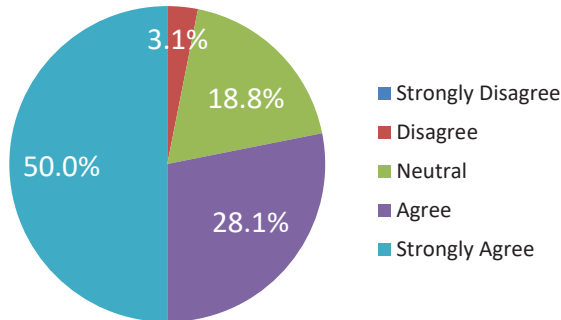


Figure 5: Response to 'The classroom project helped me to use sustainable approach and methods for designing'

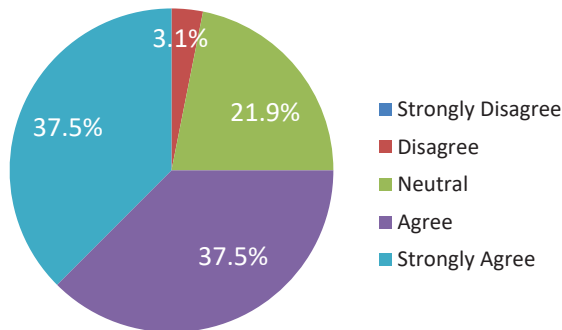


Figure 6: Response to 'Sustainable techniques and practices enhanced my creative thinking and design process'

An important research objective was to ascertain if the design project contributed to inculcating sustainability-driven attitudes, values, and preferences in future designers. 68.8 percent of the class strongly supported the idea of using sustainable design practices in their future projects, and 25 percent supported the idea (Figure 7). Regarding awareness about environmental concerns, 50 percent of the students strongly agreed

and 37.5 percent agreed with the statement, making an overall 87.5 percent of the class concur that they have become more aware of environmental issues pertaining to the fashion industry following the project (Figure 8). In response to the statement ‘As a future designer, I would make efforts to make consumers aware regarding responsible buying’, 65.6 percent of the class strongly agreed and 28.1 percent of the respondents agreed, thus a total of 93.7 percent were in agreement with the statement (Figure 9). The findings illustrate that the project instilled in students the importance of the environment and social responsibility as professionals in the field of fashion. The project helped pave the way for young designers to create eco-friendly and socially conscious designs and make sustainable choices to prioritize the planet and its people in their future design endeavors.

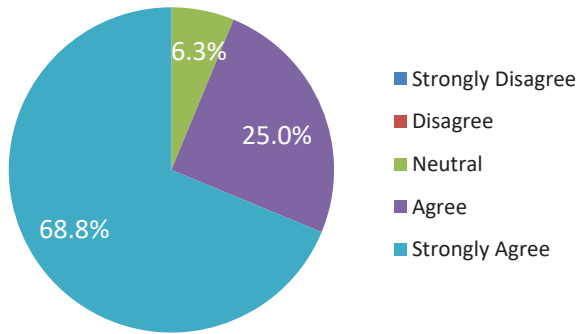


Figure 7: Response to ‘I would like to use sustainable design practice in all my future projects’

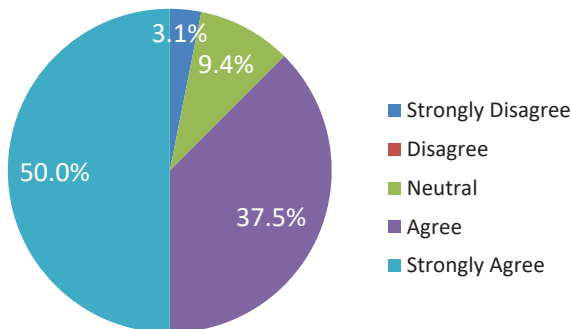


Figure 8: Response to ‘Post project, I have become more aware about the environmental issues pertaining to the fashion industry’

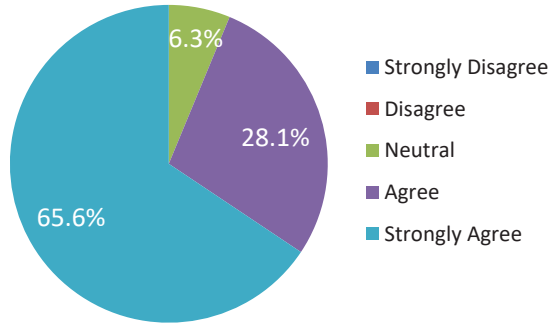


Figure 9: Response to 'As a future designer, I would make efforts to make consumers aware regarding responsible buying'

The study also attempted to examine changes in students' buying behavior post-project. Figure 10 indicates that 43.8 percent of the participants showed a strong inclination to buy Khadi products, and another 37.5 percent showed an interest in purchasing Khadi. Responding to the statement 'Following the project, I am interested in buying sustainable products', 62.5 percent strongly agreed and 28.1 percent agreed to the statement (Figure 11). The data highlights that post-project, the majority of the students developed a greater appreciation for hand-spun and hand-woven fabric and also the importance of making conscious choices as consumers.

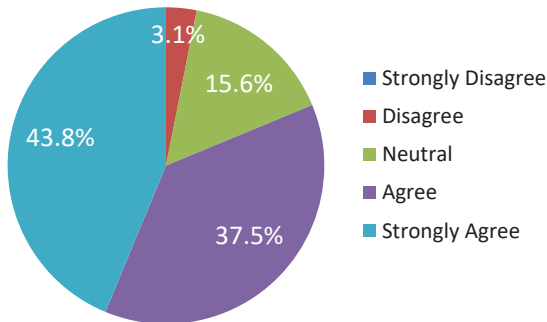


Figure 10: Response to 'I am interested to purchase Khadi products'

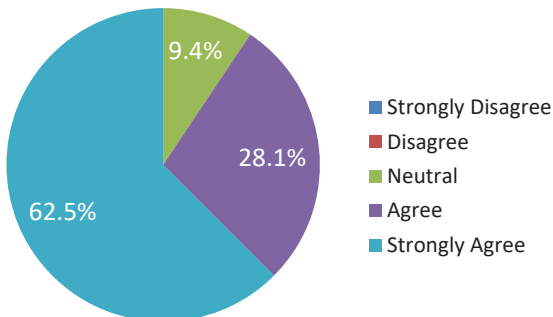


Figure 11: Response to 'Following the project, I am interested to buy sustainable products'

The questionnaire included four open-ended questions to infer students' understanding of sustainable design, learning outcomes, and the overall experience of an industry-linked classroom project. The students were asked about the key sustainable facts learned during the implementation of the project. The students' comments covered sustainable practices and techniques, from raw materials to end products and the product life cycle. Students mentioned the use of natural fibers, natural dyes, biodegradable trims, zero-waste planning, and a focus on reusing and recycling approaches. Some of the students specifically raised the concern of plastic as a non-sustainable material and its replacement with biodegradable materials. One student hinted that 'plastic trims affect the environment to a high extent' while another added 'no use of plastic in the form of buttons'. Two students were of the view that 'sustainable can also be beautiful'.

The response from students conveyed their in-depth understanding of Khadi as a sustainable material that is environmentally friendly and an income generator for India's rural communities. The following are representative comments that display students' understanding:

- "The spinning of Khadi does not use machines or energy and therefore has a low carbon footprint. The manufacturing and production processes make Khadi sustainable."
- "Khadi focuses on labor intensity and the provision of jobs to artisans and weavers."
- "Khadi clusters generate direct income for our rural communities."

The project exposed students to different sustainable brands in their secondary research; as stated by a student, "I got to know about various sustainable brands in the market and how they are using different practices to make eco-friendly products", alongside a snide comment, "The reality of the brands...".

The students were asked to elucidate the sustainable methods and techniques they incorporated to create surfaces for the classroom project. The students indicated the usage of natural materials and trims as well as handcrafted surface embellishment techniques like hand embroidery, tie-dye, block printing, and eco-dyeing. The students also emphasized the utilization of waste fabric scraps to execute appliqué and patchwork. Some of the students mentioned the application of natural dyes like turmeric, tea, and coffee on Khadi to make it completely sustainable. Special care was taken to select materials and trims for value addition that do not cause harm to the environment. Many students indicated 'the replacement of plastic trims with metal, wooden, or cloth trims'. Figures 12 to 17 represent some of the surface swatches developed by students during the module.



Figure 12: Turmeric dyed swatch with fabric manipulation by Ms. Aishani Debnath



Figure 13: Fabric scraps coiled and applied on surface with hand embroidery by Ms. Anushca Gangwar



Figure 14: Appliqué with fabric scraps and hand embroidery on coffee dyed fabric base by Ms. Mugdha Prashant Kulkarni



Figure 15: Metal rivets attached on ombre dyed fabric by Mr. Shubham Raj



Figure 16: Patchwork with left over fabrics highlighted with block printing and hand embroidery by Ms. Tanvi Jain



Figure 17: Waste yarns and fabric strips couched using hand embroidery on tea dyed fabric by Ms. Tanvi Jain

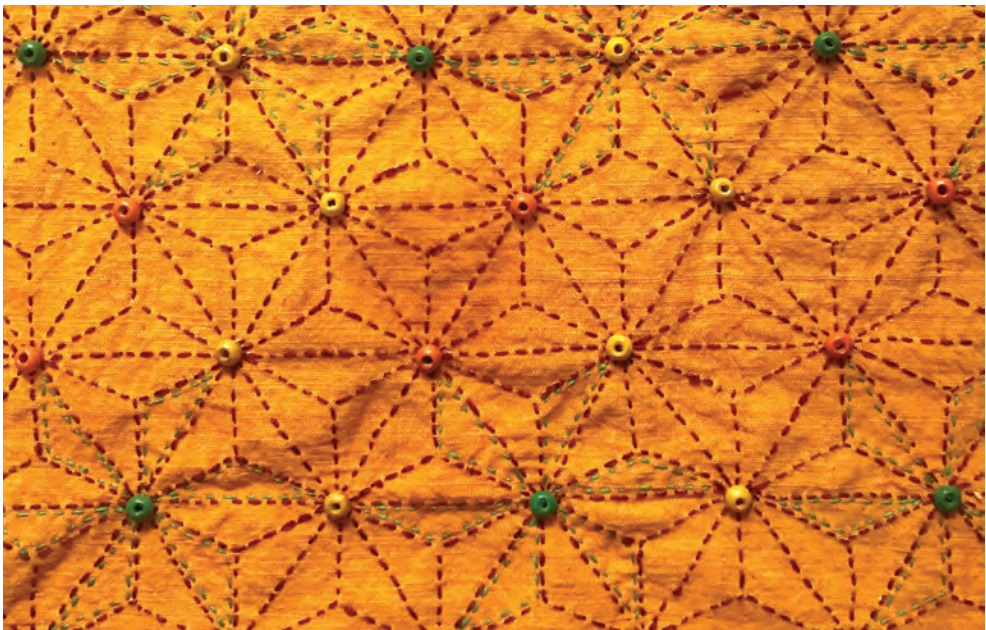


Figure 18: Hand embroidery with wooden beads on turmeric dyed fabric by Ms. Vipra Neema

Constraints are an integral part of any design project. Responding to the constraints experienced during the project, 15.6 percent of the participants faced time management issues. The other limitations stated by students were related to material constraints, keeping in view the sustainable approach that had to be followed for the development of surface swatches. The constraints related to materials are evident from student comments like “avoiding any unsustainable embellishment”, “achieving the desired effect without harming the environment”, “working with fine-quality Khadi, as it was for the first time”, “attaining a minimalistic look on the handmade Khadi” and “challenging to plan sustainable techniques on Khadi”. Few students conveyed issues pertaining to dyeing and color matching as per the color palette given by CoEK for the surface developments.

To obtain students’ perspectives on the project experience, they were asked to share their views on how the industry-linked classroom project was different from other design projects undertaken by them during the course. On the basis of the responses received from the participants, three key learning outcomes emerged. The first learning was the real-time application of sustainable practices in a design project. As mentioned by a student, “This project was completely sustainable in terms of fabric usage, printing, or surface techniques”. Most of the participants felt that the project enhanced their understanding of sustainable design and approaches and challenged their minds to conceptualize environment-friendly innovative ideas. A student states, “The project made me aware that creativity lies in sustainability, and its application can broaden one’s thinking process”.

Secondly, the project increased students’ awareness and knowledge about Khadi fabric. For the majority of students, handling Khadi was a first-time experience. Some of the participants indicated that the project generated interest in Khadi, India’s pride and future flag bearer for sustainable development. Few respondents hinted at an emotional connection with Khadi; as one student added, “It felt like a contribution to craft and nature”.

Thirdly, the students valued the hands-on live project with ongoing feedback from the industry. The following are student comments that demonstrate their experience during the project.

- “This project was one of the most hands-on projects. Each step involved careful planning and implementation. Definitely gave a sense of accomplishment upon completion.”

- “Industry mentors gave feedback on our explorations, which helped us understand the desired outcome.”
- “One-on-one conversation with the actual buyer.”
- “Designing with a production-friendly approach.”

It is deduced that the integration of a real-time industry project in the module enhanced the students’ overall learning experience. The CoEK project gave students the opportunity to practice and follow a sustainable approach to achieve the desired outcomes, and in the process, they developed an appreciation for Khadi as a material. The ‘learning by doing’ approach, coupled with interactive sessions and continuous feedback from the industry, improved student engagement and performance.

Analysis

Design education is an essential means to impart relevant knowledge to young designers and equip them with skills and abilities to handle the challenges of today. With the increasing requirement for sustainability specialists in the industry, integrating sustainability studies into the fashion and textiles curriculum is of utmost importance. Incorporating sustainability into the course is ‘a responsible action by the educators’ to ensure the employability of students after graduation (Lim, 2020).

The industry-linked classroom project conducted by the researchers was an attempt to strengthen students’ understanding of sustainable design through real-time learning. Based on the responses obtained from students, it was determined that the majority of the class was already aware of sustainable design and its approaches before the commencement of the project. However, the classroom project was meaningful and fruitful in many ways. It served as a platform for students to develop a better understanding of sustainable practices followed by home textile and apparel brands. The theoretical understanding of sustainable design was further strengthened due to the practical approach followed to develop sustainable surface swatches. Interactive sessions, consistent feedback, and critique from faculty and industry mentors further enhanced students’ learning and led to improvements in their design concepts and implementation. The CoEK project entailed the use of only Khadi fabric. The project increased students’ knowledge about Khadi, which was being handled for the first time by most of the students. The constraints of using sustainable techniques and materials in Khadi encouraged students to explore and innovate in a sustainable manner, thus enhancing their creative design ideation process and skills. Working closely with hand-spun and hand-woven Khadi instilled a sense of pride among students as a means to promote India’s fabric and artisans.

After the completion of the project, the majority of the class expressed their interest in incorporating sustainable practices into their future projects. Through this project, students became aware of the environmental issues concerning the fashion and textile industries, and based on their learning, they indicated their eagerness to make consumers aware of responsible buying behavior. The project also inspired students to make sustainable consumption choices. The project was a small step to train young minds to be responsible and conscious professionals with the abilities to strategize and design sustainable solutions.

The success of an industry-linked project can be gauged from the students' performance and the approval and acceptance of designs by the sponsor. In this project, the final surface developments (five per student) were submitted to the CoEK office. According to the terms and conditions of the project, CoEK would purchase the twenty best designs. However, the design team selected twenty-nine of the best surfaces. The selected students were conferred with a cash prize (per swatch) and a certificate of appreciation. The remaining surface developments were also acknowledged by the CoEK team, which will be displayed on their knowledge portal with a credit line to the student as the creator of the swatch.

Conclusion

Design for sustainability is a critical input that will assist designers to re-imagine and reframe industry practices, strategically address concerns, and implement sustainable fashion practices. Designers can play a crucial role as change agents in the industry, impacting production and consumption patterns, facilitating awareness among consumers, and influencing their choices.

The study provides a pedagogical framework to integrate sustainable practices into an industry-linked project for focused learning through a hands-on, practical approach. The research emphasizes the relevance of applying sustainable knowledge to design projects to gain a more holistic understanding of the subject. Developing a perception of sustainable fashion is critical, keeping in mind the growing environmental changes. Projects integrating sustainability serve as a platform to inculcate sustainable practices and educate young designers to make conscious decisions while designing, from the selection of raw materials, the process of making, and ethical sourcing to packaging. Such projects play an important role in generating awareness among future design professionals in order to change attitudes, values, and mindsets towards environment-friendly and socially responsible fashion.

The research also points towards the importance of industry collaboration for design projects to strengthen students' understanding of sustainability and its application as a regular design practice. Industry-linked projects help in bridging the gap between academia and industry, as they impart a unique opportunity to students to apply their learning in a real-time situation. Integrating with the industry can help in innovative problem solving that can lead to out-of-the-box thinking and successful ideas to support fashion businesses. Integration of sustainable practices in design projects assists in empowering designers to develop designs responsibly in order to conserve depleting resources, minimize waste, promote fair labor and ethical practices, and curtail the carbon footprint for a healthy planet.

Considering the fashion and textiles industry is a major contributor to global warming and climate change, it is crucial for fashion educators to rethink and restructure their curriculum and pedagogy in order to prepare sustainability-minded young professionals who are equipped to integrate eco-consciousness and ethical practices in the business of fashion.

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Note

1. The Centre of Excellence for Khadi (CoEK) was conceived by the Ministry of MSME to address the needs of the Khadi and Village Industries Commission (KVIC). The Center aims to build on the patronage of Khadi and develop associations with high-end domestic and international markets. It is a center for experimentation, innovation, and design for Khadi fabrics, apparel, home textiles, and fashion accessories.

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