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Encouraging innovation in the fashion industry through university projects

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Abstract

A challenge facing the clothing and fashion industry is the need to integrate different perspectives of visionary innovation. Within current circumstances of the industry and contemporary trends, there are many examples of fashion products and ideas being inspired by, or developed from interdisciplinary and technically oriented components. Based on this direction, curricula in fashion design related departments are being revised to take into account different perspectives of innovations and new technologies related with fashion products. In addition, the interaction between university and industry is an important parameter for the dissemination of the innovation concept from different perspectives, a process in which higher education institutes play a critical role. Within this context, a case project was conducted in the Department of Fashion and Textile Design in a university in Turkey. The aim of the project was to promote a new approach to combining material knowhow with the creative process, and thus draw attention to the intersection of fashion design, technology and innovation. Other investigation issues in this study were the necessity of taking an interdisciplinary approach (and research) for innovation and the contribution of university-industry collaborations.
A group of students from different design disciplines were given topics related with technically enhanced fabrics, such as high-visible fabrics, thermal range fabrics, industrial launderable fabrics, flame retardant fabrics and microencapsulated fabrics. Creating a design concept embracing these technical areas was seen as presenting a suitable level of challenge for students. A knitwear production company provided the fabrics for use in student products. At the end of the project, student projects were assessed by university instructors and company representatives. Student comments were also evaluated through survey analyses. Therefore, evaluation of projects was based on three main pillars: the instructors, the company and the students themselves. As a result, it was seen that this project was a new approach for students, and helped them to work with different restrictions in design to find innovative solutions. Students were able to improve their understanding of the

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effects of technology in fashion design issues, and to extend the boundaries of their creativity by working in an interdisciplinary manner.
Such a university-industry project with students from different disciplines could be suggested as representing an important challenge, with the potential for promoting the development of fashion industry and academic growth, especially in countries like Turkey, where industry faces an extremely-competitive environment.

Keywords: Innovation, Fashion design education, Interdisciplinary, Creativity, Turkey, University-industry collaboration

1. Introduction

In today's market, enterprises are under pressure not only to offer high quality products at competitive prices, but also to be constantly innovative, offering new products and services (Flores *et al.*, 2009). As a highly competitive industry, there is also a continual need for innovation in textiles and fashion. Innovations may emerge at different levels in the fashion system: at the stylistic, idealistic and conceptual levels, as well as in production and cutting technology or in materials. In the history of fashion, the most innovative periods were seen as the seventeenth century, and more recently, the 1920s and 1960s (Loschek, 2009). At the present time, the dominant direction of innovation in textiles and fashion is based on developments in science and technology. Apart from stylistic and idealistic levels of innovation, changes in the last few decades are seen as a revolution in technology, mostly based on interdisciplinary collaborations. According to Martin (2010), the possibility of incorporating 'high-tech' into clothing was first raised in the 1950s in regard to space exploration. 1960s was seen as the time when technology began to have a direct effect on fashion designers' collections, mostly inspired by the space-age aesthetics and developed with high-tech materials. Science, technology and fashion have never been so intertwined as they are now in the 21st century. Most fashion designers believe that the future of their discipline lies in the technological development of textiles (Clarke & O'Mahony, 2005). Interdisciplinary research is one of the main reasons for innovation in today's fashion. Collaboration of teams consisting of chemists, physicists, designers, engineers and professionals from other disciplines have the potential to create the high-tech future of fashion (Quinn, 2007). The current challenge in fashion is seen as the integration of *visionary innovation,* rather than being limited to simple variations in size, color and shape.

It is difficult to find a common accepted definition for 'innovation' due to the great diversity of innovation research in terms of technologies, products, organizations, services and markets. Considering this wide range, research into innovation in textiles and fashion is conducted through diverse processes worldwide. To represent some insights from the world, Tambo (2015) claims that innovation is a cornerstone in any industry's development, and adaption to intrinsic and outside requirements and expectations. He analysed the theoretical and empirical views of innovation in international retail networks using leading actors in the (Danish) fashion industry. To illustrate the view from a country in the Far East, Shin (2015) states that there has been a growing expectation for academics in Hong Kong not only to be innovative in their approach to research, but also to adopt an entrepreneurial approach in transferring knowledge. In this context, many governmental funding opportunities are presented to Hong Kong researchers, and subsequent financial support is offered at the university level. Fossas-Olalla *et al.* (2015) highlights the importance of innovation activity for firms' survival and growth. For companies, they recommend collaboration on innovation activities with other members of their supply chain (customers and suppliers) and with external agents to compensate for any lack of internal innovation capabilities. In their work, they analyze how technological collaboration with suppliers affects product innovation in Spanish manufacturing firms. Cappeta, Cillo & Ponti (2006) analyze innovation in the aesthetic and symbolic elements of products and services. They note that there are many innovations in the market struggling for market acceptance, and the focus of many related studies is on building and testing new models on the emergence and affirmation of a new design in a technology-driven context. Technology is considered

as a major driver for change, both at an industry and at an organizational level. They additionally argue that, for many industries, ranging from the automotive to the hospitality sectors, including creative industries, such as fashion and design, a growing proportion of innovative activity is linked to the aesthetic and symbolic elements of the products or services. Therefore, technological and the stylistic innovations are recognized as reinforcing each other.

There are many current examples of local and international commercial/conceptual projects, which show the tendency towards visionary innovations in fashion. Due to this new direction in fashion, curricula in fashion design departments at higher education level are being revised to incorporate different perspectives on innovations and new technologies. In particular, new bachelor and master degree programs have been established based on the need for expertise and innovative thinking in this new stream of fashion. Guerrero *et al.* (2009) claims that currently, the ability to innovate ensures reliable added-value for career development, which will be increasingly marked by a designer's capacity to adapt to the various creative and work environments.

Higher education institutes play a critical role in the dissemination of different perspectives on the concept of innovation. Flores *et al.* (2009) claim that industry–university collaboration is increasingly becoming an important topic to spur collaboration for innovation in local networks. Their study highlights the importance of universities in the promotion and enabling of the formation of collaborative environments by managing applied research projects, diffusing these concepts, and coaching companies. As they claim:

> "…Universities are considered a focal element for the development and dissemination of new knowledge and technologies for the design, development and commercialisation of new products and processes.
>
> …Very little research has been carried out so far to analyse how different agents in the territory, such as universities, can promote and create new collaborative environments for the transfer of knowledge to foster innovation and promote regional sustainable development."

In a similar context, Etzkowitz (2003) argued that the transformation of academia into a source of innovation is connected with the transformation of innovation from an internal process within individual firms to one that takes place among firms and between firms and knowledge-producing institutions. Their "Triple Helix" model reflects the interaction of university-industry-government aimed at improving the conditions for innovation in a knowledge-based society.

To analyse Turkey's perspective, it is possible to say that the recognition of fashion design as a serious academic subject in the country has come into focus rather late. The development of textile and fashion in Turkey is based on the extensive textile and clothing manufacturing industries. The shift of labour intensive manufacturing industries to Far Eastern countries due to lower manufacturing costs has created problems for countries such as Turkey, since their export-based strategies could no longer be sustained. This changing status of clothing industry in Turkey has led to an increasing interest in design and innovation in textiles and fashion, both at the level of tertiary education and commercial initiatives (Vuruskan & Bulgun, 2012). Today, various funds are being made available by the Turkish government to universities and companies to encourage innovative projects. Innovation week is an example of such an initiative, designed to create a platform organized by the Turkish Exporter's Assembly and the Ministry of Economy, to address innovation, design, technology and R&D themes bringing together universities, companies, students, researchers and entrepreneurs.[*] Similarly, The Scientific and Technological Research Council of Turkey (TÜBİTAK) has initiated alternative funding support for new applications and innovative projects [†].

Within this context, three main topics have been investigated in this study:

[*] https://www.turkiyeinovasyonhaftasi.com/tr/default.html

[†] http://www.tubitak.gov.tr/en

- Current challenges in fashion design as *visionary innovations* based on science and technology
- Necessity of an interdisciplinary approach (including research) for innovation in fashion design
- University-Industry collaborations

Considering that visionary innovations are seen as vital to the future of the fashion industry, the overall aim of this study was to investigate an approach to integrate innovation in fashion design education on the basis of interdisciplinarity, and in collaboration with a business organisation. This is seen as an important contribution to the development of both industrial and academic growth, especially in countries like Turkey, where industry faces an extremely competitive environment. Therefore, a case project was realized in the Department of Fashion and Textile Design at a university in Turkey, planned in collaboration with an industrial partner, involving students from different disciplines. A technically-based theme was selected, allowing an investigation of the three main points as described above.

2. Methods

A detailed project was designed to allow the investigation of the three main issues described in previous section. The case project was developed in a university in the Department of Fashion and Textile Design. The project included a design task for students from different design disciplines. A business organization from the region was selected as the collaborative partner. The company was a knitwear production site, which is amongst the largest 500 industrial companies in Turkey, manufacturing and exporting 15-18 million pieces of womenswear garments per year. The company produces circular knitted fabrics in their knitting and dyeing mill. *

The evaluations of the project were based on three main sources: the university instructors, the company and the students. Qualitative research methods were applied with survey analyses, personal communications and observations. A photo archive was also created during the process. The procedures and the content of the project can be considered under the following sub-titles:

2.1. Project start up and aims of the project

The project took place within an elective course under the guidance of the course instructor. In order to clearly define the frame of the project, meetings were conducted with company representatives. Following this, the project title, “Innovative design development by using technical fabrics” was decided on and a period of 10 weeks was allocated for the project. One field that can be considered as closely connected with fashion and innovation is material technology, which adds value to fashion products in many different ways. Five main areas related with the use of technically enhanced fabrics were selected: high visible fabrics, thermal range fabrics, industrial launderable fabrics, flame retardant fabrics and microencapsulated fabrics. Creating a design concept embracing these technical areas was seen as presenting a suitable level of challenge for students.

Students were informed about the general outline of the project. Their task in the project was to develop a concept and a collection based on technical textiles. The aims for the students were given as follows:

* http://www.suntekstil.com.tr/

- Gain experience of working in collaboration with an industrial partner
- Develop presentation skills to company representatives in a professional manner
- Encourage students from different disciplines to work together and to develop innovative ideas
- Apply the skills and knowhow from their different courses to create an innovative product and process
- Discuss innovations and the new developments in fashion products, materials and technologies
- Extend the borders of creativity by using the cutting edge of technology

After the introduction of the topic to the students, a field trip to the company was organized. The field trip, firstly, included an overview of the company's production facilities. Since students were from different design disciplines, it was important that they were all introduced to the knitting, dyeing and garment manufacturing departments. After this overview, they attended a seminar on the selected five topics of the proposed project.

2.2. Student groups and project time frame

23 students participated in this project, either in their 3rd or final year of study. Groups of 3 or 4 students were formed by the instructor of the course. Special attention was paid to allocating students from different disciplines to each group. While innovation is a mix of design and realization, learning business is also important. Therefore this project included a collaboration of design and business students. Most groups consisted of one student each from the following departments: Fashion Design, Fashion Business, and Interior Architecture or Architecture. Among the 10 weeks of the project process, in-class group discussions, student presentations, final exhibition set-up and jury evaluation took place. The tasks of the project included following procedures in the project brief:

1. A research report about the given topic. Examples of current textile/ fashion/architecture related studies/products/design work -with visuals, short explanations and references
2. Information board (title, short information about the topic and fabric swatches)
3. Concept / Function development
4. Moodboard of the concept
5. 4 looks related with the topic (Front, back and detail drawings)
6. Prototype sewing (One outfit from the collection)
7. Exhibition set up
8. Presentation to the company representatives / Faculty members / Students

2.3. Project exhibition and evaluation of projects

The evaluation of projects was conducted by three groups: instructors, company representatives and students. An exhibition was organized in the Faculty of Fine Arts and Design, in which students presented their work to the company representatives, faculty members and other students. Each group was provided with a 2m2 booth for exhibition. Evaluations were conducted at the exhibition opening by the course instructor, three other instructors from the department, and the designer from the company. This created an interactive platform, in which students were able to present their ideas

both orally and visually through their exhibition stands. This approach encouraged visitors' comments and discussions on the projects.

Apart from the observations and feedback provided at the exhibition, an anonymous survey was conducted to evaluate students' perspectives at the end of the project. The survey included 20 questions evaluating the project in terms of research, innovation, functionality and the progress. Data was collected by the other instructors through personal communications. Observations throughout the whole process were noted, and all visuals were photographed for the archive, both from the products and the exhibition stands.

3. Results

Results of the project are given from the three main partners of this project: university, company and students.

3.1. Evaluation of the project by university instructors

The course instructor's evaluation, based on observations and personal communications, considered the progress of students. By preparing a research report about the given topic and searching for the current textile /fashion/architecture related examples, students were able to prepare a background for their design research. The technical knowhow helped students to extend the limits of their creativity. Students increased their understanding of the importance of the role of interdisciplinary research in such projects, as opposed to being based merely on trends and inspirations.

It was seen that design students were used to developing ideas related with a particular concept, but not with the use of specific materials to a defined target. Therefore, the process was reversed, so that students were limited to using technically enhanced fabrics. They were encouraged to define the target user, and develop the concept accordingly. Even though students were initially resistant to the project theme, thinking that this could limit their `design` capabilities as design students, at the end of the project, they realized that the requirements of the project were matched those of the industry, and this would be a useful preparation for professional work after graduation. Working in groups was another challenge, as students were from different levels and different departments. Such group work reflected the composition of teams in a company. Students were expected to share the tasks of the project among themselves, which was based on their group decisions alone. Even though they allocated the tasks following the procedures in the project brief, each student had the opportunity to follow the whole process from research to prototype production. The procedures in the project brief helped students to keep to the given deadlines and complete weekly tasks. Identifying costs and building up business plans were not included in the criteria given by the company since the aim was for students to concentrate on the innovation of product and concept development, without being limited by other business related parameters.

At the end of the project, three other instructors from the department evaluated projects after listening to student presentations at the exhibition opening. They expressed their satisfaction with the creativity of students despite the restriction to technically oriented knitted fabrics.

3.2. Evaluation of the project by the company

For the final exhibition opening and evaluations, representatives from the company were invited. They expressed their satisfaction with the creativity of the projects. They highlighted that the

limitations of cost, production parameters, business plans and such other factors had the effect of reducing the creativity of designers in professional life. Therefore, they underlined the importance of collaboration of industry with universities, because student minds are more open to new design ideas. Etzkowitz (2003) advocated a similar approach, highlighting the comparative advantage of universities for promoting innovation development.

3.3. Evaluation of results by students

Apart from observations and personal communications with students, a general outline of survey results are also given in this section. According to the results, most students found their prior research successful and value-adding to their process and final collection. They were asked to evaluate their own projects in terms of creativity/ innovation, functionality, and commercial aspects. Results showed that students generally found their products commercially successful and/or functional. Their rating of the importance of creativity and innovation was last. This result shows the different perspectives of company representatives and the students. Even though the projects were evaluated as being creative by the company representatives, this differed from the student perception.

At the end of the project, students realized that creativity and innovation required an in-depth research and know-how of technical aspects related with their topics. Around 70% of students expressed that they had never worked on such a project before. Therefore, these results were important outcomes of the project, showing that such a project could create a different perspective for students, leading to greater awareness of innovation. Students commented on the positive effects of interdisciplinary group work in increasing creativity, developing innovative ideas, becoming more specialized during the project work, and saving time. Most students reported gaining experience by working in collaboration with an industrial partner and found such a collaboration encouraging and constructive.

Considering all comments and results from the survey, it was seen that this project was a new approach for students, and helped them to work with different restrictions in design to find innovative solutions, which can be called a real life scenario. The vast majority of students expressed opinions regarding the necessity for technical innovation courses and projects in design related fields, which was seen as an omission in their current curriculum.

4. Conclusions

This research is based on the fluid conditions of fashion and textile design in Turkey and in the world, in which a clear shift can be seen towards visionary concepts, generally through an interdisciplinary path. This phenomenon should be reflected in the content of design related programs in higher education, as well as the curriculum of existing programs. This study involved such a project in which the technical base for visionary innovations, interdisciplinary student groupings and business collaboration were the main explorations. By the end of the project, students realized the importance of interdisciplinary synergies, either for a conceptual design project or for a commercial product. They understood the importance for innovation of experimentation and discussion in groups.

Since there was an interaction throughout the three pillars in this project, all pillars achieved benefits in different aspects. This collaboration led to the production of ideas of greater innovation. Such a university-industry project with students from different disciplines could be suggested as representing an important challenge, with the potential for promoting the development of fashion industry. Students are the designers, entrepreneurs and business people of future. New visions could be opened up in student minds with such projects.

It is considered that textiles and fashion, two important features of the global economy, have a broad range of applications and that therefore, interdisciplinary work in these areas is crucial.

Considering Turkey's position in the textiles and apparel market, it is clear that, in order to survive in the market, the industry needs to keep up with developments in art and design as well as technology. Visionary innovation and interdisciplinary studies are seen as an added value, and it is believed that the concept of creativity through visionary innovations should play a greater role in the curriculum in fashion design departments at the level of higher education. In addition, it is recommended that companies should invest more time and money in visionary and innovative projects for universities. Similarly, the government should also support university-industry collaborations and innovative projects.

The value of this project is as an example of a contemporary project in Turkey. The approach taken in this study is expected to make a contribution to the development and discussion of fashion education in this context. Implications of the current study include its role as an example, and as a recommendation to higher education institutes of the integration of visionary innovation related interdisciplinary projects and company collaborations into their curriculum. Encouraging students to learn about the concept of innovation from different perspectives is clearly an investment, since this is seen as the future of our industry.

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