5 A fashion design project conducted in collaboration with a sewing company to reuse remnants, and its educational benefits

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Applicable principle

Principle 9: A commitment to promoting sustainability through education

1. Activity objective and background

Awareness of sustainable fashion and recycling businesses continues to grow in the apparel industry, and many companies have now launched efforts to reduce the environmental burden of their production processes. Schools have also begun covering environmental issues in the fashion industry, such as in home economics classes or through inquiry-based learning, and so awareness of these issues is both increasing and spreading among consumers as well.
However, students outside of school are interested in how mass production can make clothing more inexpensive, and it cannot be said that their environmental concerns are being reflected in their purchasing behavior.
Ninohe Fashion Center Co., Ltd., which collaborated with the members of this project, develops factory brand products using leftover fabric and remnants, and practices resource-recycling manufacturing by upcycling surplus materials generated during manufacturing processes. Leftover fabric and remnants are unused materials left over from clothing production processes. Large amounts of surplus fabric from different materials are generated each season at manufacturing sites handling diverse products in small lots. This leftover fabric is normally collected by specialists and discarded as a business expense.
This project was part of a graduation work project led by two students in the Division of Lifestyle Design in the Department of Home Economics of Morioka Junior College. The objective was to verify the feasibility of utilizing remnants through the process of proposing, producing, and evaluating clothing designs. One important aim of this project was to go beyond merely proposing designs, and to contribute to actual production processes in order to consider what exactly sustainable fashion and clothing designs that can be worn for a long time are, as well as to consider what kind of clothing people want today.

2. Activity details

In June, the students went to visit a factory in order to observe the manufacturing site and survey the current situation of leftover fabric and remnants. They were told about the types of situations in which remnants are generated, and were shown actual examples of leftover fabric and materials. The students who participated in this project were both enrolled in the Practical Clothing Production course, but this was their first time visiting a factory. It was a valuable opportunity to see how fabric is handled and learn about production processes.
In July, the students began considering specific designs based on what they had learned. Unlike traditional design where the designer can freely choose fabrics, the students proceeded to consider designs appropriate for the autumn season based on existing design concepts for the factory brand, using only remnant fabric. They met two times with a factory pattern maker (a specialist who creates patterns based on design drawings) to discuss the designs. With guidance from professional factory craftspeople, the students finalized a feasible design by minimizing waste and by considering the brand concept, target audience, relevance to modern tastes, production timeline, fabric properties, and stock levels.

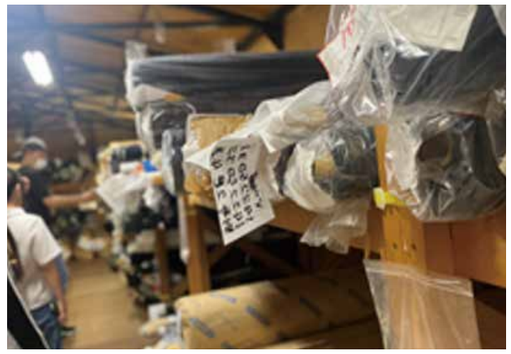

Fig. 1: Visiting the factory and checking remnants

From August to September, the students drafted their own pattern drawings based on the finalized designs, and then created toiles (models for temporary sewing). These patterns and toiles underwent around three rounds of prototyping and revisions based on advice from the factory pattern maker, with factors such as the range of motion, sewing techniques, and design details taken into consideration. The students then used a factory CAD system to convert their completed patterns into industrial patterns for mass production.
They also wrote specification documents for production at the factory. In October, the students participated in actual production work at the factory, and were involved in sewing the first samples. They first used a CAM system (a system that automates and streamlines manufacturing processes based on design drawings) to arrange the patterns, allowing them to see

Fig. 2: Design drawings

Fig. 3: The results of a meeting

how leftover fabric is actually generated. Here, they learned how careful pattern arrangement can reduce the amount of leftover fabric. They also had the opportunity to use extremely difficult equipment during some production processes, and experience firsthand how crucial a role skilled and advanced techniques play in factory production.
In November, the first samples finished by hand by factory craftspeople arrived to be checked by the students. They inspected the samples for measurement and sewing precision and made slight design adjustments, and then requested second samples from the professionals at the factory. In doing so, the students took the perspective of “corporate customers” placing an order and wrote out instructions to precisely indicate the changes they wanted made.
The results of the project were shared with the public. The first samples were displayed in a showroom in the Iwate Prefectural Office in December, while the second samples were displayed during a fashion event held at a shopping mall in the city.

Fig. 4: Creating a first sample

実施時期	活動内容
6月21日	二戸ファッションセンター工場視察 『来衣』の説明・打ち合わせ
7月8日	第一案デザインオンラインプレゼン・チェック
7月29日	第二案デザインオンラインプレゼン・チェック
8月9日	パタンナーによる第1回トワルチェック
9月初旬	トワル修正・仕様書・パターン作成
9月25日	パタンナーによる第2回トワルチェック
10月25日	CAD・CAMシステムによるパターン配置・裁断 1stサンプル作成（一部制作に参加）
11月18日	1stサンプル完成・検品、修正依頼
12月16日~27日	岩手県庁にて1stサンプルの展示 第1次アンケート実施
12月22日	2ndサンプル完成・検品（最終検品） 展示用サンプルの完成
2月16日	イオンモール盛岡に展示用サンプル（2nd） ファッションイベントにて展示

Table 1: Production schedule

3. Activity development

During this project, students gained hands-on experience in the practical processes of clothing production, learned of the importance of reducing waste, and studied specific methods used to create recycled fashion. They also improved their abilities to solve issues at sites and communicate with others, through interacting with factory experts while solving issues.
Finally, they learned how remnants are actually generated in manufacturing processes by involving themselves in production work. During the design process, the students took multiple constraints into consideration, such as which designs would best prevent the generation of remnants, which designs would best suit the brand concept, and whether their designs incorporated basic elements such as functionality and comfort in addition to looking attractive. This allowed the students to develop the ability to take multiple factors into consideration, such as material constraints, brand consistency and feasibility, and to show creativity within constraints in a way not possible through free thinking alone.
The major educational benefit of this project was that the students could take these diverse perspectives into consideration, take sustainable fashion as a personal issue, and engage in multifaceted examination and practice.

Fig. 5: Creating a first sample

Fig. 6: Completed first samples on display