Fashion Meets Science: Analysing Students' Views on Fashion Design and Pattern Making

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Abstract
This paper analyses science students' acceptance of subjects related to fashion and clothing. This study aims to analyse acceptance levels of students learning fashion-related subjects when enrolled in the Diploma in Textile and Clothing Technology, which is under the Faculty of Applied Sciences. A questionnaire was given to a group of students (n=59) who enrolled in fashion-related subjects consisting of close-ended and open-ended questions. This allows for a quantitative assessment of acceptance levels while also capturing qualitative insights into students' attitudes, motivations, and concerns regarding their studies in fashion design and pattern making. Findings reveal a multifaceted perspective on the intersection of fashion education and scientific principles, highlighting a strong appreciation for creative aspects of fashion design alongside a recognised need for rigorous technical and theoretical knowledge. Students emphasize the importance of practical skills, such as drawing and hands-on experiences, while advocating for a curriculum that integrates industry relevance and interdisciplinary approaches.
Keywords: Science Students, Perception, Fashion Design, Clothing Subjects, Pattern Making

Introduction
The textile and clothing industries are integral to the national economies of numerous countries (Jones, 2006; Dicken, 2003). In Malaysia, this sector is experiencing rapid growth. According to the Malaysian Investment Development Authority (n.d.), the textile and clothing industry is projected to generate USD 5.2 billion in 2023. As the industry expands, stakeholders are increasingly focused on leveraging available opportunities to their advantage. To remain competitive, textile and clothing industry players are seeking highly versatile candidates capable of executing both theoretical and practical tasks that will drive their businesses forward. Employers are prioritising graduates who possess proficiency in information technology (IT), creativity, innovation, and a deep understanding of the evolving dynamics within the industry (Chida & Brown, 2011). Consequently, it is important for

Malaysia's textile and clothing programs to undergo significant transformation to meet the evolving demands of the industry.

The evolution of this sector requires incorporating contemporary subjects and technical skills that meet the industry demands. Consequently, fashion and pattern-making subjects are now crucial for increasing graduates' employability (Bicho et al., 2022; Zanu et al., 2024). In the fashion and clothing industry, technical skills in designing, patternmaking, and sewing are essential for graduates to market themselves and establish niche careers effectively (Zakaria et al., 2022). These additional skills enhance graduates' practical capability but also boost graduates' confidence and competitiveness in a highly competitive job market.

To create an optimised curriculum, science students' acceptance and engagement towards fashion-related subjects must be evaluated and understood. Understanding science students' acceptance level toward the fashion subject is vital in creating the best educational experience and assisting them in preparing for their professional careers (Renninger & Hadi, 2017). Acceptance and engagement levels can significantly influence students' learning experiences and outcomes. Student attitudes, interests, and expectations are fundamental in shaping their educational journey and professional preparedness. Therefore, assessing these elements is essential for developing a curriculum that meets academic standards and aligns with students' objectives.

This paper aims to analyse the acceptance levels of students enrolled in the Diploma in Textile and Clothing Technology towards fashion-related subjects. Student attitudes, interests, and expectations of these subjects were explored and analysed. This study provides insights to enhance the curriculum and better integrate science and fashion, preparing students for innovative careers in the textile and fashion industries. This project aims to contribute to the continuing conversation on interdisciplinary education, specifically at the interface of science and fashion. The outcomes of this study benefit the curriculum development and support broader educational strategies that foster creativity, technical expertise, and industrial readiness among the graduates. The holistic approach is also essential for nurturing the next generation of professionals who can drive innovation and sustainability in the textile and fashion sectors.

Methodology
A questionnaire is the most classic tool for obtaining primary data (Roppa & Rani, 2012). This study employs a mixed-method orientation between quantitative and qualitative methods by using close-ended and open-ended questions. Students were asked close-ended questions before they answered open-ended questions to enhance their answers regarding the value of fashion-related subjects.

Quantitative data were collected using a closed-ended questionnaire. The sampling strategy used was purposive sampling involving students from the Diploma in Textile and Clothing. Second-year students were targeted as these students have completed all fashion and clothing-related subjects. Google Forms was utilised as the platform for disseminating the questionnaires. A total of 59 students took part in the study.

The questionnaire was divided into five sections. The questionnaire's first section (Part A) seeks to obtain demographic information, including a question on the students' science background. The second part (Part B) was about the level of interest where students needed to choose whether they liked or disliked fashion and pattern-making subjects introduced during their study. The questions continue with Part C, with five questions on the level of understanding and skills in fashion and pattern making that the students have learnt after they completed the subjects. The last part, Part D, is the achievement level (grades) of every student to determine how the understanding and skills can be related to the student's grades. Part A until D was given the answer choices 'Yes' and 'No'. An open-ended question was asked in the fifth section, which is Part E, asking what the most useful and valuable aspect of the course is.

All data were analysed using descriptive and correlation analysis. Correlation analysis is a statistical method used to measure the strength between two variables. Generally, correlation analysis will determine the relationship between the students' grades and their level of understanding and skills in fashion-related subjects.

Results and Discussion
Close-Ended Questions
Table 1 displays respondents' demographic details, i.e., gender, ethnicity, and science background. There were 59 respondents in total, with 94.9% women and the remaining 5.1% men. Half of the respondents come from a science background (50.8%), while another 49.2% were from a non-science background. Although the Diploma in Textile and Clothing is under the Faculty of Applied Sciences, more students from non-science backgrounds were accepted to enrol in this program, which made the ratio of science and non-science backgrounds almost 1:1.

Table 1
Demographic details (n=59)

Details	Frequency	Percentage (%)
Gender		
Male	3	5.1
Female	56	94.9
Ethnicity		
Malay	58	98.3
Others	1	1.7
Science Background		
Yes	30	50.8
No	29	49.2

The following bar graphs in Figure 1 and Figure 2 provide a comprehensive overview of science students' engagement with fashion-related subjects, specifically focusing on their level of interest and understanding in subjects such as fashion design and pattern-making. As the textile and clothing industries evolve, understanding students' perceptions and competencies in these areas becomes increasingly vital for curriculum development (Gault, 2017). By analysing these graphs, we can gain valuable insights into how effectively the current educational offerings resonate with students and identify opportunities for

enhancement. The data presented will serve as a foundation for discussing the implications of student interest and understanding of their overall learning experience and career preparedness in the fashion industry.
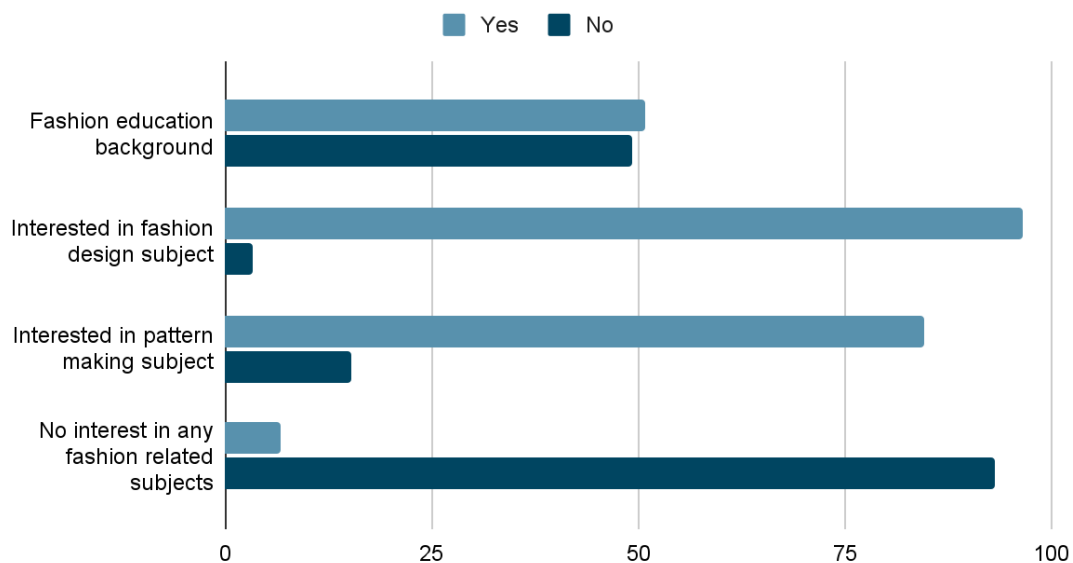

Figure 1 Level of Interest (n%)

The bar graph in Figure 1 illustrating the "Level of Interest" among science students towards fashion and pattern-making subjects provides critical insights into students' engagement within the courses. This graph categorises interest levels into segments such as yes for high interest and no for low interest. For instance, 97% of students indicated 'Yes' towards the question of interest in fashion design subjects; this would suggest a favourable perception of fashion-related textile courses, which is essential for fostering a positive learning environment. Conversely, 3% of students fall into the 'No' category, which highlights potential challenges that may hinder engagement, prompting a need for educators to explore underlying factors contributing to this disinterest. Understanding these dynamics is crucial for curriculum development, as it enables academic institutions to tailor course offerings that align with student preferences, thereby enhancing motivation and participation in the learning process (Attin & Jeffery, n.d.).

Conversely, while 85% of students express an interest in the pattern-making subject, only 15% categorise themselves as having 'No' interest. This represents a significant concern that must be addressed. The reasons behind this disinterest could be multifaceted, including a lack of awareness about the relevance of fashion in science, perceived difficulty of the subject, or insufficient exposure to practical applications (Roberts et al., 2019). Understanding these factors is vital for educators to develop strategies aimed at boosting engagement, such as integrating real-world applications, guest lectures from industry professionals, or hands-on projects that illustrate the intersection of science and fashion (Kazlacheva et al., 2018).

Based on Figure 1, approximately 51% of students enrolled in this course have a fashion education background, while 49% do not, indicating a near 1:1 ratio of the students with and without prior fashion experience. The presence of students from both backgrounds could significantly contribute to the overall enthusiasm for fashion-related subjects. This

balance may contribute to the high overall interest in fashion-related subjects, as reflected in the bar graph where 93% of students express enthusiasm for these topics, leaving only 7% without any interest. Such a significant level of interest suggests that students recognise the value and relevance of fashion education, potentially enhancing their engagement and motivation in the courses (Choi, 2017).
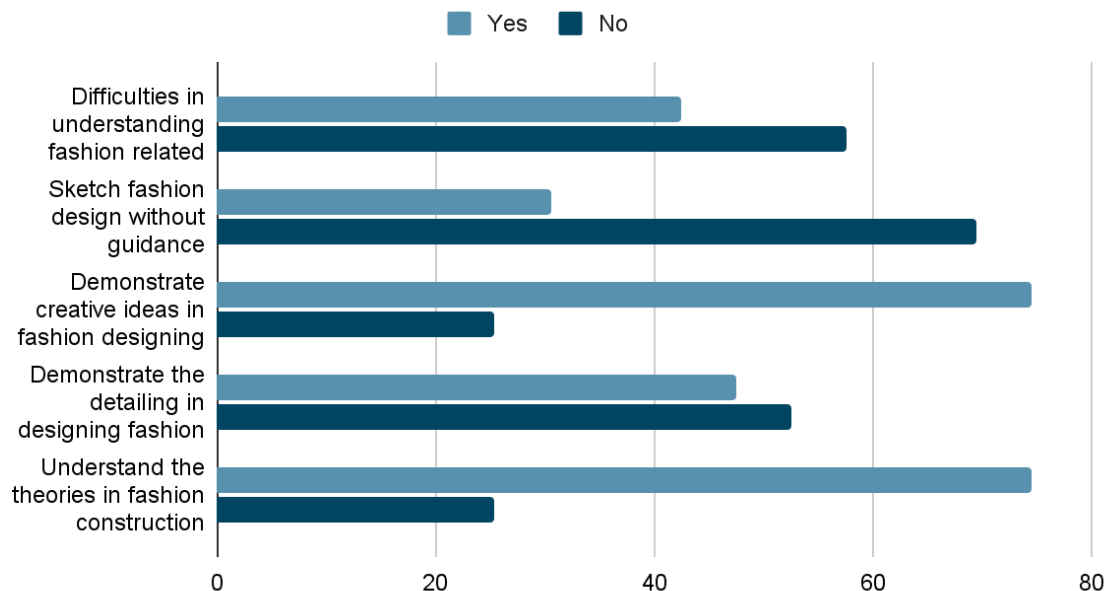

Figure 2 Level of Understanding and Skills (n%)

The second bar graph in Figure 2 depicts the "Level of Understanding and Skills" acquired by students post-completion of fashion-related subjects, serving to assess the effectiveness of the textile course program. This graph categorises students into 'No' as high understanding and 'Yes' as low or moderate understanding. 58% of students fall into the 'No' category; this would indicate that the subjects successfully impart essential knowledge and skills relevant to the fashion industry. However, 42% of students are in 'Yes,' as in moderate and low understanding; this raises concerns regarding gaps in teaching methodologies or content delivery. These findings underscore the importance of continuous evaluation and refinement of the textile course, ensuring that it meets the educational needs of all students and equips them with the competencies necessary for successful careers in the textile and fashion industries (Raichurkar, 2018).

However, the survey revealed that 30% of students self-identified as capable of sketching fashion designs without guidance, while 70% indicated their inability to do so. These findings suggest potential gaps in the educational curriculum. Students who chose the 'No' may possess some fundamental knowledge but require additional resources or guidance to achieve proficiency. Conversely, 75% of students demonstrated creative ideas in fashion design, while 25% exhibited limited creativity and knowledge. This disparity underscores the urgent need for course reassessment, instructional improvement, or additional support services to provide students with a comprehensive range of design ideas.

These insights emphasize the paramount importance of continuous curriculum evaluation to ensure its alignment with the diverse educational needs of all students. While

the majority of the students (75%) demonstrated an understanding of fashion theories, 25% encountered significant difficulties comprehending the underlying concepts. By addressing these identified gaps and enhancing instructional methods, educators can effectively prepare students for successful careers in the textile and fashion sectors. This approach fosters an integrated curriculum that aligns with industry demands, promoting a well-rounded education that equips students with the skills and knowledge necessary for thriving in these dynamic industries (LeHew & Meyer, 2005).

Open-Ended questions
The responses to questions 6 and 7 in the survey reveal several key aspects of the course that students found particularly useful and valuable. Primarily, question 6, which students emphasised the significance of creativity in fashion design, noticing that it enhances their ability to produce unique and innovative works. Students across various institutions consistently report that creative expression is crucial for their engagement and success in the field (Sawitri et al., 2020). Additionally, a solid understanding of fashion history was highlighted as crucial, as it allows students to appreciate the evaluation and cultural significance of the field.

Practical skills were also a focal point, with many students expressing satisfaction with hands-on experiences, such as learning to operate sewing machines and creating tangible items like pillows and tote bags. Furthermore, some respondents recognised the course's broader curriculum, which encompasses subjects such as management and statistics, thereby providing a comprehensive educational experience beyond the confines of fashion alone. Lastly, the acquisition of technical skills, including pattern making and fabric dyeing techniques, is noted as beneficial for their future endeavours in the fashion industry.

In summary, this feedback underscores the importance of a multifaceted approach to fashion education that integrates creativity, practical application, and interdisciplinary knowledge. The incorporation of interdisciplinary subjects, such as marketing, management, and technical skills, is increasingly recognised in fashion design evaluations. Programs that offer a broader educational framework tend to receive positive feedback, as they equip students with a diverse skill set relevant to various aspects of the fashion industry (Roberts et al., 2019). This mirrors the current course's approach of covering additional topics beyond fashion, reinforcing its comprehensive educational value.

Collectively, the responses to question 7 reveal several avenues for enhancing the course, focusing on both practical and theoretical development. Firstly, students expressed a strong desire for increased relevance to the fashion industry, emphasising the importance of understanding industry standards and practical applications in design. Additionally, there was a notable emphasis on skill development, particularly in drawing, with students advocating for regular practice to enhance their design capabilities. Effective study strategies were also a common theme, with suggestions for improved time management and collaborative study approaches to promote teamwork and smart learning (Hua et al., 2013).

Furthermore, respondents highlighted the need for more hands-on experiences, such as workshops that would allow them to apply their skills in real-world contexts. Theoretical knowledge was another area of focus, with many students calling for a deeper exploration of

fashion-related science and technical aspects to provide a robust understanding of materials and techniques. Finally, there was a consensus on the necessity for better preparation strategies before classes and examinations, aimed at improving overall learning outcomes. This feedback underscores the students' desire for a more interactive, practical, and theoretically grounded curriculum that aligns closely with industry practices and fosters personal skill development.

Conclusion

In conclusion, the investigation into the acceptance of fashion-related courses among students with science backgrounds reveals a multifaceted perspective on the intersection of fashion education and scientific principles. The findings indicate a strong appreciation for the creative aspects of fashion design, alongside a recognised need for rigorous technical and theoretical knowledge (Zeng, 2020). Students emphasize the importance of practical skills, such as drawing, and hands-on experiences, while also advocating for a curriculum that integrates industry relevance and interdisciplinary approaches (Oviawe et al., 2021).

This survey has several limitations. Firstly, the sample size may be limited and lack diversity, affecting the generalisability of the findings. Self-selection bias is another concern, as participants may already have an interest in fashion, skewing the results (Stimson & Wang, 2023). Additionally, unclear or ambiguous questions could lead to misunderstandings, and reliance on closed-ended questions may restrict the depth of insights captured. The findings represent opinions at a specific time, potentially overlooking changes in industry trends or educational practices (Stimson & Wang, 2023). Focusing solely on current students excludes valuable perspectives from alumni or industry professionals, while cultural and regional differences may not be adequately represented. Lastly, emotional factors can influence responses, complicating the interpretation of acceptance and interest in fashion courses (Roberts et al., 2019). Acknowledging these limitations is essential for refining future research in this area.

Responses highlight the desire for courses to encompass not only traditional design elements but also the scientific underpinnings of materials, techniques, and sustainability practices. This reflects a growing awareness of the role that science plays in modern fashion, underscoring the necessity for educational programs to evolve in alignment with industry demands and student interests. Overall, the findings suggest that a comprehensive curriculum that balances creativity, technical skill development, and scientific knowledge could significantly enhance the appeal of fashion-related courses for students with science backgrounds, ultimately fostering a more integrated and innovative approach to fashion education.

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