Examining External Factors Influencing the Sustainability of New Textile and Fashion Products Using PESTEL Analysis Dashboard

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ABSTRACT

PESTEL is a vital strategic tool that examines Political, Economic, Social, Technological, Environmental, and Legal factors impacting a business. Traditional PESTEL analysis often relies on static reports and manual data compilation, leading to delays and limited insights. Businesses need a dynamic, real-time approach to promptly respond to external changes affecting product success. This approach aims to leverage Power B.I.'s data visualization capabilities to perform comprehensive, real-time PESTEL analysis, enabling more informed and agile decision-making during new product development. Students can incorporate their new products' ideas with current scenario, including PESTEL analysis to have more dynamic forecasts on product sustainability in the market. Effective analysis guides students in navigating external influences during new product development. Integrating Power B.I. with PESTEL analysis introduces an interactive, automated framework that consolidates diverse data sources into visual dashboards. This enhances the accuracy, speed, and depth of external factor assessments, setting it apart from conventional methods. By providing timely insights, this method helps students develop products better aligned with societal needs and environmental considerations, promoting sustainable innovation. Commercially, it accelerates product launch timelines, reduces risks, and increases market adaptability, ultimately benefiting consumers and stakeholders alike. Utilizing Power B.I. for PESTEL analysis offers students a more innovative, efficient way to support new product development, fostering sustainable growth and societal well-being through data-driven strategies.

Keywords— Textile and Fashion, New Product Development, PESTEL Analysis, POWER B.I. sustainability, market share

INTRODUCTION

Product development in Textile and Fashion is one way for undergraduate students to highlight their knowledge and creativity. A lot of new ideas have been integrated with the theory of textile principles combined with advanced technology available. Innovations in textile and fashion have truly expanded our perspectives on the world on the development of newly designed products in medical and health due to ageing society, protective system due to war and natural disaster, new usage of materials and other challenging scenario (Horne, L., 2012). It is very important to make sure the new product can sustain in the market and have an extended maturity in the Product Life Cycle. Traditionally, the approach is through survey to know the acceptance of products to consumers. This method does not analyze any external factors that can influence the sustainability of new products in market. Using this new approach can enhance students' critical thinking. Critical thinking, defined as the ability to assess information objectively and reach rational conclusions, is both a valuable skill and a crucial requirement for succeeding in this ever-changing environment (Glogar, 2025).

A major obstacle to developing critical thinking abilities in students is the traditional curriculum's emphasis on memorization and technical skills, often at the expense of advanced cognitive processes (Akhdinirwanto et al., 2020). A highly effective method for aiding students in enhancing their critical thinking abilities is the implementation of problem-based learning (Benedicto & Andrade, 2022). Due to that, PESTLE Analysis using Microsoft Power B.I. can be integrated to support decision-making and business planning with real-time analytics and market insight tools. By doing this, students can enhance critical thinking and real-world business analysis skills. Students evaluate internal (SWOT) and external (PESTLE) factors affecting their

innovation, using market data visualized in dashboards.

OVERVIEW

The PESTLE acronym stands for Political, Economic, Social, Technological, Legal and Environmental factors. PESTLE framework is a tool to analyze and monitor the macro-environmental factors that have an impact on a company and the industry environment in which it operates. The PESTEL model highlights the importance of certain relevant market traits in formulating global marketing strategies (Schlegelmilch, B.B., 2022). Microsoft Power B.I. is a business intelligence (B.I.) platform that provides nontechnical business users with tools for aggregating, analyzing, visualizing and sharing data. Power B.I.'s user interface is intuitive for users familiar with Excel, and its deep integration with other Microsoft products makes it a versatile self-service tool that requires little upfront training. The Power B.I. service enables users to perform a variety of tasks, which can be broadly categorized into two main activities: creating and sharing content and consuming and interacting with content. Students need to do research on impact factors under each PESTLE analysis. This can enhance students critical thinking with world scenario related to Textile and Fashion product development. For example, in the Environment external analysis, students must search on current trends of awareness related to environmental such as recycle policy, green technology, consumer sensitivity and other related factors. By analyzing this external factor, sustainability and acceptance of new textile and fashion products can be predicted. Furthermore, the dashboard gives students interactive ways to monitor external factors that are always changing. Students can use a dashboard by Microsoft Power B.I. to do a digital presentation during product pitching. This knowledge can help students to be more confident with extra skills and use it when working with companies after graduating from university. Integrating critical thinking skills into the curriculum is not just beneficial but essential for preparing students to handle the complexities and progress in the field (Kettley, 2011)

Problem Statement

Most of the time, students are exposed to theory and practical skills in Textile and Fashion related fields. Students taking notes and being tested for their knowledge teach in the lecture. Students also gained experience by practical work such as in the area, for example testing, dyeing, weaving and fashion technology. Students need to enhance their critical thinking skills and other knowledge in the usage of software. Students completing higher education programs need to possess critical thinking skills (Swart, 2017). This cannot be done just by listening to lectures. Students need to explore and do research, communicating with peers and with real consumers especially on subjects related to new product development in textiles and fashion.

Students struggle to grasp the intricate relationships between internal and external factors that have an impact on the sustainability of new products in the market. This can lead to poor understanding, limited analytical thinking, and weak decision-making skills. Recent studies confirm the significance of critical thinking across various fields, emphasizing its contribution to improving problem-solving skills, encouraging creativity, and promoting continuous learning (Perdanasari et al., 2021). Instructors also face challenges in monitoring and evaluating students' work if it is not interactive and does not represent the whole scenario of studies. Providing instructors with the required resources is crucial for successfully integrating critical thinking strategies in their classrooms, thus aiding students in cultivating these vital skills (Munawi et al., 2020).

In addition, the textile and fashion industries is increasingly driven by data and digital technologies, yet students are often unprepared to meet these demands due to the lack of exposure to interactive software that simulate real-world scenarios. The absence of such tools reduces the practical value of new textile and fashion product development courses, affects student motivation, and contributes to skills mismatches in the job market. Therefore, there is a crucial need for user-friendly solution that enhances critical thinking and powerful presentation tools aligns with both academic goals and industry expectations. These abilities go beyond simply recalling information and adhering to regulations; the system enables learners to analyze critically, resolve issues, and make educated decisions in circumstances that are continuously evolving and uncertain (LeHew & Meyer, 2005)

Benefits To Society

Digital Skill Development**:** The usage of PESTEL powered by Microsoft Power B.I. equips students with essential digital and analytical skills aligned with the requirements of Industry 4.0. Students develop competencies in digital literacy and critical thinking. These skills are essential in a digitally fluent and future-ready workforce.

Accessible Education: Microsoft Power B.I. is an accessible software that can be assed for free as extension of Microsoft software. This can continue to be used when students in the working world.

Empowering Lifelong Learning: It allows learners of all backgrounds to upskill or reskill in textile and apparel product development process and contribute to community development, economic mobility, and sustainable employment opportunities across different socioeconomic groups.

Developing Dashboard with Power B.I.

The first step in doing PESTEL analysis is to gather data on impact factors. Students through brainstorming and research listed all external factors under Political, Economic, Social, Technological, Environmental, and Legal with appropriate subfactors. For example, under Technological, subfactors such as “Imparting New Technology”, “Developing of New Materials”, can be included. Determinations of impact factors in percentage will define which have strong influence on the sustainability of new textiles and fashion products in the market. The data in Excel form will be imported to be used in Microsoft Power B.I. The next step in Power B.I. is to assign each impact factor to build a dashboard where data can be simultaneously inserted when students are working in a group. The dashboard will be used to monitor any changes in impact factor, and this can enhance awareness on external factors when developing new products.

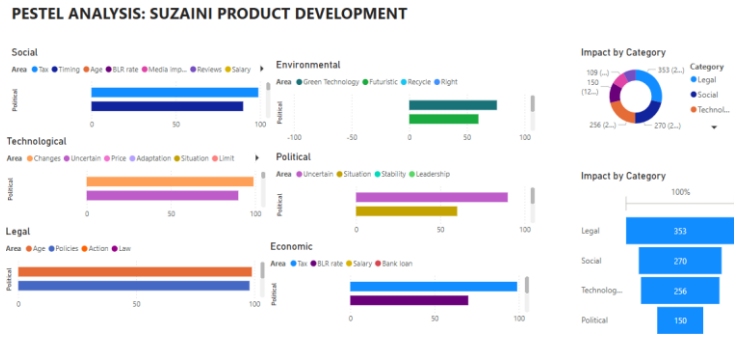

Figure 1 Example of Dashboard by Power B.I.

Students’ Acceptance

A survey has been distributed to undergraduate students who are taking the course in the New Product Development for Textile and Fashion course. Below is the outcome of the survey.

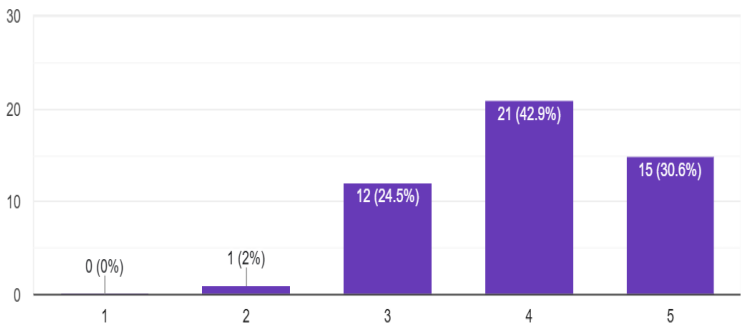

Figure 2 Percentage distribution on PESTEL is extension of SWOT

A total of 73.5% of remarks of 4 and 5 agreed that PESTEL analysis is the extension of SWOT analysis. SWOT analysis is for analyzing external factors meanwhile PESTEL is analyzing external factors that are more on developing their critical thinking skills. Students gain a deeper understanding of the topic and its practical applications by tackling real-life issues. This enhances the learning experience, making it more significant and engaging (Yulianti, 2021).

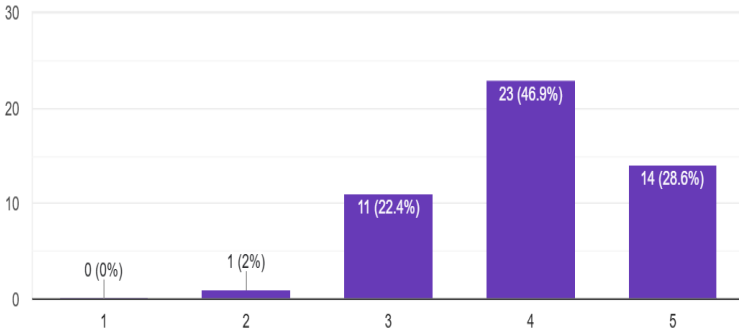

Figure 3 Percentage distribution on helping with interpreting data

A rating of 4 (46.9%) and rating of 5 (28.6%) were collected when students were asked if the system helps them with interpreting data more comprehensively so that students can write an analytical report and make a better presentation. This approach encourages teamwork in addressing issues, enhances analytical capabilities, and develops strong communication skills, which are vital for achievement in the working world (Cortázar et al., 2021).

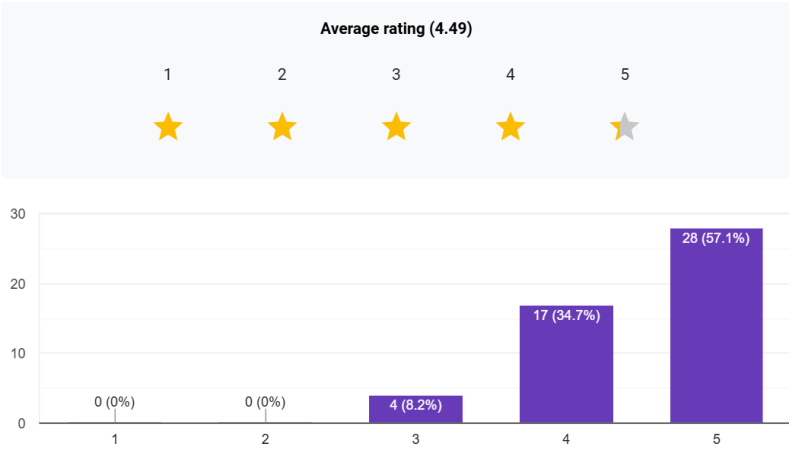

Figure 4 Average rating scored

Average rating of 4.49 was scored and this showed that students appreciate the usage of PESTEL analysis and the Microsoft POWER B.I. to create a dashboard. This can be concluded that such analysis is needed alongside their approach of developing of new products for textile and fashion industries.

CONCLUSIONS

The PESTEL analysis powered by Power B.I gives a broad applicability across various educational, industrial, and research contexts. Its flexibility, accessibility, and real-time analytical capabilities make it a valuable tool for enhancing productivity, learning outcomes, and innovation in the textile and fashion industry. The PESTEL Analysis by POWER B.I. serves as a practical teaching tool in universities, colleges, and polytechnics offering programs in textile and fashion technology, fashion design, product development and manufacturing management. By integrating the usage of software into classroom activities, educators can simulate real-world impact factors related to new product development, promote experiential learning, and assess student understanding through interactive exercises. Textile and apparel companies can adopt this system for internal

workforce training and skill development. It can be used to train staff in to be more critical when developing new products. Academic and industrial researchers can explore the usage of dashboards to study the economic impact of new textile innovations. By inputting different external factors, researchers can simulate the external factors under multiple conditions. This helps with analyzing market feasibility and informing sustainable product development.

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