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Internal and external factors influencing fashion design characteristics among undergraduate fashion design students

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ABSTRACT

This study aimed to examine the effects of internal and external factors on students' fashion design characteristics in the Women's Fashion Design course. An explanatory quantitative study with a correlational design was conducted involving 30 fourth-semester students from the Fashion Design Vocational Education Study Program at Universitas Aufa Royhan Padangsidimpuan using total sampling. Internal and external factors were measured through validated questionnaires, while fashion design characteristics were assessed using a performance-based rubric. Data were analyzed using multiple linear regression. Internal factors significantly influenced fashion design characteristics ($\beta = 0.613$, $t = 5.613$, $p < 0.001$), as did external factors ($\beta = 0.374$, $t = 3.424$, $p = 0.002$). Simultaneously, both variables significantly predicted fashion design characteristics ($F = 82.314$, $p < 0.001$; Adjusted $R^2 = 0.849$). Strengthening students' internal competencies alongside supportive learning environments is essential for improving creativity and the quality of fashion design outcomes.

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Introduction

Fashion design education plays a strategic role in preparing graduates with creative, technical, and problem-solving competencies required by the rapidly evolving fashion industry (Abbate et al., 2024; Ostermann et al., 2021; Yoo et al., 2021). In this context, fashion design characteristics refer to the distinctive qualities of a design reflected in originality, aesthetic judgment, innovation, silhouette, color composition, design details, and design principles. The development of these characteristics depends not only on technical competence but also on students' ability to transform ideas into creative and market-oriented fashion products. Therefore, fashion design education should integrate creativity with technical mastery to produce innovative design outcomes (M. L. Kim et al., 2024; Lim & Ju, 2023).

Recent developments indicate that fashion design performance is shaped by the interaction between internal and external factors. Internal factors, including talent, interest, knowledge, technical skills, and motivation, provide the foundation for creative thinking, whereas external factors, such as technology, instructional methods, socio-cultural influences, and exposure to global fashion trends, facilitate the development of creative potential. Contemporary fashion education increasingly emphasizes project-based learning, technology integration, and industry collaboration to strengthen both dimensions (AbdelAziz et al., 2023; Cayaban et al., 2023; Etuk et al., 2022). Previous studies similarly demonstrate that intrinsic motivation and supportive learning

environments encourage creative exploration and improve design performance (Cui et al., 2009; H. Wang, 2013).

Although creativity, learning motivation, and instructional strategies have been widely investigated, previous studies have generally examined these factors separately, resulting in fragmented evidence regarding students' fashion design performance. Moreover, authentic performance-based assessment of fashion design characteristics remains limited, particularly in Indonesian higher education, where studies have predominantly focused on isolated aspects of creativity. Consequently, the combined contribution of internal and external factors to students' fashion design characteristics has not been comprehensively explained, leaving important methodological and empirical gaps in the literature (Liao, 2001; Zhou & Chen, 2023).

Addressing this gap is important because fashion design characteristics represent multidimensional indicators of students' ability to integrate creativity with technical competence through silhouette, color composition, design details, design principles, and design innovation. Understanding the determinants of these characteristics can support the development of learner-centered instructional strategies that strengthen creativity, technical proficiency, technology integration, and industry collaboration in higher education (Ego & Chibuzor, 2023; Hidayat et al., 2022; Trippeer et al., 2022). Such improvements are increasingly necessary as fashion education adopts competency-based and innovation-oriented curricula aligned with industry needs (Chung & Park, 2020; Kaewpilarom et al., 2023).

The novelty of this study lies in proposing an integrated framework that simultaneously examines the influence of internal factors (talent, interest, knowledge, technical skills, and motivation) and external factors (global fashion trends, socio-cultural environment, technology utilization, and instructional methods) on students' fashion design characteristics using multiple linear regression and authentic performance-based assessment. Unlike previous studies that primarily investigated these determinants independently, this research provides a more comprehensive understanding of their relative contributions while offering both theoretical and practical evidence for improving fashion design education. Accordingly, this study aims to analyze the partial and simultaneous effects of internal and external factors on students' fashion design characteristics in the Women's Fashion Design course.

Method

This study employed a quantitative explanatory design with a correlational approach to examine the effects of internal and external factors on students' fashion design characteristics in the Women's Fashion Design course. The study involved all 30 fourth-semester students enrolled in the Fashion Design Vocational Education Study Program at Universitas Aufa Royhan Padangsidimpuan. Because the population was limited to one cohort consisting of 30 students, total sampling (census sampling) was adopted to ensure complete population coverage and eliminate sampling bias. Internal factors (X_1) comprised talent, interest, knowledge, technical skills, and learning motivation, while external factors (X_2) included exposure to global fashion trends, socio-cultural environment, technology utilization, and instructional methods. The dependent variable, fashion design characteristics (Y), was operationalized through five dimensions: silhouette, color composition, design details, design principles, and design innovation, which collectively represent students' creative and technical performance in fashion design.

Data were collected using structured questionnaires and a performance-based assessment rubric. Internal and external factors were measured using a five-point Likert scale, whereas students' fashion design characteristics were evaluated through authentic assessment of their final fashion design products using standardized scoring criteria. The assessment rubric was developed based on the five design dimensions and evaluated by experts to establish content validity. The questionnaires also underwent expert review, followed by construct validity testing using Corrected Item–Total Correlation. After invalid items were removed, the final instrument consisted of 45 items for internal factors and 32 items for external factors. Reliability testing produced Cronbach's Alpha coefficients of 0.947 and 0.939, indicating excellent internal consistency. To improve scoring objectivity, the performance rubric was standardized before implementation, and its content validity reached 88.57%, indicating that the instrument was appropriate for evaluating students' fashion design performance.

Data analysis was performed using IBM SPSS Statistics. Descriptive statistics were first calculated to summarize the characteristics of each variable. Prior to hypothesis testing, the assumptions of multiple linear regression were examined using the Shapiro–Wilk test for normality, Tolerance and Variance Inflation Factor (VIF) for multicollinearity, and the Glejser test for heteroscedasticity. Multiple linear regression was selected because the study aimed to examine the simultaneous and partial effects of two independent variables on a single dependent variable. Considering the relatively small sample size, all regression assumptions were verified before model estimation to ensure the validity of statistical inference. Model fit was evaluated using the coefficient of

determination (Adjusted R^2), while the F-test assessed the simultaneous effect of the independent variables and the t-test examined the individual contribution of each predictor. Statistical significance was established at $p < 0.05$.

Results and Discussions

The results are organized into three sections. First, descriptive statistics are presented to summarize the distribution of the study variables, including internal factors, external factors, and students' fashion design characteristics. Second, the assumptions of multiple linear regression are evaluated through normality, multicollinearity, and heteroscedasticity tests to ensure the appropriateness of the statistical model. Finally, hypothesis testing is performed using the coefficient of determination (Adjusted R^2), the overall model significance (F-test), and regression coefficients (t-test) to examine both the simultaneous and individual effects of the independent variables on fashion design characteristics.

Table 1. Descriptive Statistics of the Study Variables

Variable	Category	Score Interval	n	%
Internal Factors (X_1)	Good	165–225	8	26.67
	Moderate	105–164	15	50.00
	Low	45–104	7	23.33
External Factors (X_2)	Good	118–160	7	23.33
	Moderate	75–117	9	30.00
	Low	32–74	14	46.67
Fashion Design Characteristics (Y)	Good	55–75	11	36.67
	Moderate	35–54	19	63.33
	Low	15–34	0	0.00

Table 1 presents the descriptive distribution of the study variables. Internal factors were predominantly classified as moderate (50.00%), indicating that most students possessed an adequate level of intrinsic characteristics related to creativity, motivation, confidence, and learning readiness. In contrast, external factors were largely categorized as low (46.67%), suggesting that learning facilities, instructional approaches, technological support, and exposure to fashion trends were not yet optimal. Regarding the dependent variable, most students (63.33%) demonstrated moderate fashion design characteristics, while none were classified in the low category. These findings indicate that although students generally exhibited acceptable design competence, improvements in both internal and environmental conditions remain necessary to enhance design quality.

Table 2. Classical Assumption Tests

Test	Indicator	Result	Decision
Normality	Shapiro–Wilk Sig.	0.597	Normal distribution
Multicollinearity	Tolerance	0.438	No multicollinearity
	VIF	2.285	No multicollinearity
Heteroscedasticity	Glejser Sig. (X_1)	1.000	No heteroscedasticity
	Glejser Sig. (X_2)	1.000	No heteroscedasticity

Prior to hypothesis testing, the regression assumptions were evaluated. The Shapiro–Wilk significance value of 0.597 confirmed that the residuals followed a normal distribution. Furthermore, both independent variables produced Tolerance values of 0.438 and VIF values of 2.285, indicating the absence of multicollinearity. The Glejser test also revealed significance values of 1.000 for both predictors, confirming homoscedastic residuals. Therefore, all classical assumptions were satisfied, supporting the suitability of the multiple linear regression model for hypothesis testing.

Table 3. Model Summary

R	R^2	Adjusted R^2	Std. Error
0.927	0.859	0.849	1.926

The regression model demonstrated a strong level of explanatory power. The Adjusted R^2 of 0.849 indicates that 84.9% of the variance in students' fashion design characteristics was explained jointly by internal and external factors, whereas only 15.1% was attributable to variables outside the proposed model. This high coefficient of determination suggests that the selected predictors provide substantial explanatory capacity for variations in students' fashion design characteristics.

Table 4. Simultaneous Effect of Internal and External Factors on Fashion Design Characteristics

Source	SS	df	MS	F	Sig.
Regression	610.564	2	305.282	82.314	0.000
Residual	100.136	27	3.709		
Total	710.700	29			

The ANOVA results demonstrate that the regression model was statistically significant ($F = 82.314$, $p < 0.001$), indicating that internal and external factors simultaneously influenced students' fashion design characteristics. The significant F-test confirms the overall adequacy of the regression model and demonstrates that the combined contribution of both predictors effectively explains variations in fashion design quality.

Table 5. Multiple Linear Regression Analysis

Predictor	B	SE	β	t	Sig.
Constant	43.138	1.095		39.385	0.000
Internal Factors (X_1)	0.064	0.011	0.613	5.613	0.000
External Factors (X_2)	0.047	0.014	0.374	3.424	0.002

Multiple linear regression analysis revealed that both predictors significantly contributed to students' fashion design characteristics. Internal factors exhibited the strongest influence ($\beta = 0.613$, $t = 5.613$, $p < 0.001$), followed by external factors ($\beta = 0.374$, $t = 3.424$, $p = 0.002$). The positive standardized coefficients indicate that improvements in students' intrinsic attributes, such as creativity, motivation, and self-confidence, together with stronger environmental support, are associated with higher-quality fashion design characteristics. Moreover, the larger standardized coefficient of internal factors suggests that individual characteristics play a more dominant role than external conditions in shaping students' fashion design outcomes.

The findings indicate that students' fashion design characteristics were generally at a moderate level, reflecting adequate competence in applying design elements such as silhouette, color, design details, and design principles. Similarly, internal factors were predominantly moderate, whereas external factors remained relatively low. These results suggest that students possess sufficient foundational competencies but still require stronger personal development and greater environmental support to enhance creativity and innovation. Similar findings have been reported in previous studies emphasizing that fashion design performance develops through continuous learning experiences and creative practice (Hong et al., 2025; Tang & Chen, 2013; P. Wang, 2018).

The regression analysis identified internal factors as the strongest predictor of fashion design characteristics ($\beta = 0.613$, $p < 0.001$). This finding indicates that talent, interest, knowledge, technical skills, and motivation substantially contribute to students' ability to produce creative and aesthetically appealing designs. Students with higher intrinsic motivation are more likely to explore ideas, refine concepts, and produce innovative work. These findings support previous research demonstrating that creativity and design achievement are strongly associated with intrinsic motivation, domain knowledge, and technical competence (Berestova et al., 2022; H. Y. Kim et al., 2019; Papasolomou et al., 2023; Yu & Chun, 2020).

External factors also showed a positive and significant influence on fashion design characteristics ($\beta = 0.374$, $p = 0.002$), although their contribution was smaller than that of internal factors. Exposure to fashion trends, socio-cultural influences, technology, and effective instructional methods enriches students' creative perspectives and design development. However, the relatively low descriptive scores indicate that these external supports have not yet been fully optimized. Previous studies similarly reported that technology-rich learning environments and authentic design experiences positively enhance students' creativity and design quality (Liang et al., 2020; Palomo-Domínguez et al., 2023; Papasolomou et al., 2023; Thomas, 2020).

The simultaneous regression analysis demonstrated that internal and external factors jointly explained 84.9% of the variance in fashion design characteristics (Adjusted $R^2 = 0.849$), with the regression model being highly significant ($F = 82.314$, $p < 0.001$). This finding suggests that students' creative performance is influenced by the interaction between individual competencies and environmental support. Strong internal capabilities become more effective when accompanied by learning environments that provide adequate resources, guidance, and opportunities for creative exploration. Similar relationships have been highlighted in educational and creativity research (Cho et al., 2022; Polan, 2026; Shen et al., 2026; Thorisdottir & Johannsdottir, 2020).

This study provides empirical evidence that strengthening both personal and environmental factors is essential for improving fashion design characteristics among university students. These findings imply that fashion design courses should integrate learner-centered instruction, digital design technologies, industry-based projects, and continuous feedback to foster creativity and innovation. Future research should examine additional

variables, including creative self-efficacy, design thinking, and digital literacy, using larger samples to obtain a more comprehensive understanding of the determinants of fashion design performance.

Conclusions

This study concludes that both internal factors and external factors significantly influence students' fashion design characteristics in the Women's Fashion Design course, both individually and simultaneously. Internal factors, including talent, interest, knowledge, technical skills, and motivation, were found to exert the strongest influence, indicating that students' personal competencies play a dominant role in producing creative and high-quality fashion designs. Meanwhile, external factors, such as global fashion trends, socio-cultural environment, technology, and instructional methods, also contributed significantly by supporting students' creative development. Collectively, these variables explained a substantial proportion of the variance in fashion design characteristics, demonstrating that the integration of strong individual competencies with a supportive learning environment is essential for enhancing students' creativity, innovation, and overall design performance in fashion education.

References

Abbate, S., Centobelli, P., Cerchione, R., Nadeem, S. P., & Riccio, E. (2024). Sustainability trends and gaps in the textile, apparel and fashion industries: S. Abbate et al. Environment, Development and Sustainability, 26(2), 2837–2864.

AbdelAziz, K., Md Saad, N. H., & Thurasamy, R. (2023). Analysing the factors influencing customer engagement and value co-creation during COVID-19 pandemic: the case of online modest fashion SMEs in Egypt. Journal of Islamic Marketing, 14(1), 146–173.

Berestova, A., Burdina, G., Lobuteva, L., & Lobuteva, A. (2022). Academic Motivation of University Students and the Factors That Influence It in an E-Learning Environment. Electronic Journal of E-Learning, 20(2), 201–210.

Cayaban, C. J. G., Prasetyo, Y. T., Persada, S. F., Borres, R. D., Gumasing, M. J. J., & Nadlifatin, R. (2023). The influence of social media and sustainability advocacy on the purchase intention of Filipino consumers in fast fashion. Sustainability, 15(11), 8502.

Cho, E., Kim-Vick, J., & Yu, U.-J. (2022). Unveiling motivation for luxury fashion purchase among Gen Z consumers: need for uniqueness versus bandwagon effect. International Journal of Fashion Design, Technology and Education, 15(1), 24–34.

Chung, H. J., & Park, J. (2020). Contemporary Characteristics of Fashion-textile Design Applying Paisley Ornament. Journal of the Korean Society of Clothing and Textiles, 44(5), 950–968. https://doi.org/10.5850/JKSCT.2020.44.5.950

Cui, Y., Zhang, A., & Zhong, H. (2009). The influence of the knitted fabrics' Characteristics on the fashion design. Proceedings of the Fiber Society 2009 Spring Conference, 1220–1222. https://www.scopus.com/pages/publications/84902687916?origin=resultslist

Ego, J., & Chibuzor, D. (2023). Factors influencing Choice of Clothing and textiles among undergraduate students: A study of Teaching Facilities, Career Prospects and Strategies for improvement. Pakistan Journal of Multidisciplinary Innovation, 2(2), 46–63.

Etuk, A., Anyadighibe, J. A., James, E. E., & Ukpe, M. U. (2022). Sociological factors and consumer buying behaviour towards fashion clothing. International Journal of Applied Research in Social Sciences, 4(2), 21–34.

Hidayat, H., Primandari, S. R. P., Ferdian, F., & Fitria, R. (2022). The Empirical Study of Factors Affecting Students' Competence of Fashion Design Education in the Industrial Revolution 4.0 Era. International Journal of Instruction, 15(4), 259–276.

Hong, Y. J., Park, S., Ha, S., Kang, J.-Y., & Koo, S. (2025). Design characteristics, preferences, and satisfaction toward virtual fashion using augmented reality. International Journal of Fashion Design, Technology and Education. https://doi.org/10.1080/17543266.2025.2480788

Kaewpilarom, T., Sakthirasunthon, A., Kampeerapappun, P., & Thephatsadin Na Ayuthaya, C. (2023). Fashion accessory products design from handspun mulberry and cotton blended yarn: Mechanical characteristics and consumer response. Cogent Arts and Humanities, 10(1). https://doi.org/10.1080/23311983.2023.2198320

Kim, H. Y., Kim, M. ji, & Kan, H. (2019). A Study on the characteristics of fashion design appeared by media art-focusing on Marshall McLuhan's media theory-. Journal of the Korean Society of Clothing and Textiles, 43(4), 459–473. https://doi.org/10.5850/JKSCT.2019.43.4.459

Kim, M. L., Yun, S. H., Moe, I., & Yang, E. K. (2024). Gender Characteristics in Virtual Fashion Design -

Virtual Avatars' Genders and Genderless Fashion Design Concepts-. Journal of the Korean Society of Clothing and Textiles, 48(3), 397–416. https://doi.org/10.5850/JKSCT.2024.48.3.397

Liang, Y., Lee, S.-H., & Workman, J. E. (2020). Implementation of artificial intelligence in fashion: are consumers ready? Clothing and Textiles Research Journal, 38(1), 3–18.

Liao, G. (2001). Logos, meaning, fashion - Expound the architectural characteristics of university through the design of science and technology building of Hubei Technology Institute. Huazhong Jianzhu - HJ/Huazhong Architecture, 19(1), 67-68+73. https://www.scopus.com/pages/publications/0035945934?origin=resultslist

Lim, S. E., & Ju, H. (2023). Types and Esthetic Characteristics by Function in Portable Smart Fashion Design; [휴대형 스마트 패션 디자인의 기능에 따른 유형 및 심미적 특성]. Journal of the Korean Society of Clothing and Textiles, 47(1), 1–16. https://doi.org/10.5850/JKSCT.2023.47.1.1

Ostermann, C. M., Nascimento, L. da S., Steinbruch, F. K., & Callegaro-de-Menezes, D. (2021). Drivers to implement the circular economy in born-sustainable business models: a case study in the fashion industry. Revista de Gestão, 28(3), 223–240.

Palomo-Domínguez, I., Elías-Zambrano, R., & Álvarez-Rodríguez, V. (2023). Gen Z's motivations towards sustainable fashion and eco-friendly brand attributes: The case of Vinted. Sustainability, 15(11), 8753.

Papasolomou, I., Melanthiou, Y., & Tsamouridis, A. (2023). The fast fashion vs environment debate: Consumers' level of awareness, feelings, and behaviour towards sustainability within the fast-fashion sector. Journal of Marketing Communications, 29(2), 191–209.

Polan, B. (2026). The Great Fashion Designers: From Chanel to Galliano, the names that made fashion history.

Shen, F., Yu, J., Wang, C., Jiang, X., Du, X., & Tang, J. (2026). Imaggarment: Fine-grained garment generation for controllable fashion design. IEEE Transactions on Visualization and Computer Graphics.

Tang, H.-Y., & Chen, Y. (2013). The extraction of song brocade's characteristic elements and the application in fashion design. Advanced Materials Research, 796, 484–487. https://doi.org/10.4028/www.scientific.net/AMR.796.484

Thomas, K. (2020). Cultures of sustainability in the fashion industry. Fashion Theory, 24(5), 715–742.

Thorisdottir, T. S., & Johannsdottir, L. (2020). Corporate social responsibility influencing sustainability within the fashion industry. A systematic review. Sustainability, 12(21), 9167.

Trippeer, B., Stark, J., Gam, H., Ellis, N., Morgan, B., & Park, J. G. "Phillip." (2022). Sustainable textiles for health and well-being: an investigation of curricular opportunities for fashion design and interior design student collaboration. Journal of Textile Design Research and Practice, 10(2), 214–238.

Wang, H. (2013). 3D fashion design and technical showing of its characteristics. Advanced Materials Research, 821–822, 774–777. https://doi.org/10.4028/www.scientific.net/AMR.821-822.774

Wang, P. (2018). On the artistic characteristics of computer aided design in fashion design. Communications in Computer and Information Science, 874, 322–328. https://doi.org/10.1007/978-981-13-1651-7_29

Yoo, F., Jung, H. J., & Oh, K. W. (2021). Motivators and barriers for buying intention of upcycled fashion products in China. Sustainability, 13(5), 2584.

Yu, H., & Chun, J. (2020). A Study on Upcycle Fashion Design Based on the Characteristics of Materials and Techniques. Journal of the Korean Society of Clothing and Textiles, 44(5), 984–1003. https://doi.org/10.5850/JKSCT.2020.44.5.984

Zhou, X., & Chen, Y. (2023). The Characteristics of Fashion Magazine Layout Design Style Based on Aesthetic Measure Model. Applied Human Factors and Ergonomics International, 69, 778–785. https://doi.org/10.54941/ahfe1002901