Psychomotor Skill Development Among Fashion Design Students: A Qualitative Study at SMKN 3 Kota Blitar

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Abstract
This study aims to analyze the development of psychomotor skills among Fashion Design students at SMKN 3 Kota Blitar and identify the supporting and inhibiting factors in practical learning. Employing a descriptive qualitative approach, data were gathered through non-participant observation, semi-structured interviews with students, teachers, and the head of the Fashion Design program, as well as documentation. The findings reveal that students' psychomotor skills evolve from basic imitation to more advanced levels of adaptation and creativity. Key supporting factors include adequate laboratory facilities, intensive teacher guidance, and high student motivation, while obstacles such as limited practice time, material shortages, and fear of mistakes hinder progress. The study concludes that structured assessment instruments and flexible, industry-oriented learning methods significantly enhance students' psychomotor competence, providing insights for more adaptive vocational education practices. Penelitian ini bertujuan untuk menganalisis perkembangan keterampilan psikomotorik peserta didik Program Keahlian Tata Busana di SMKN 3 Kota Blitar serta mengidentifikasi faktor pendukung dan penghambat dalam pembelajaran praktik. Penelitian menggunakan pendekatan kualitatif deskriptif dengan teknik pengumpulan data berupa observasi non-partisipatif, wawancara semi-terstruktur dengan siswa, guru, dan kepala program keahlian, serta dokumentasi. Hasil penelitian menunjukkan bahwa keterampilan psikomotorik berkembang dari tahap imitasi dasar menuju adaptasi dan kreativitas dalam tugas menjahit dan mendesain. Faktor pendukung utama meliputi fasilitas laboratorium yang memadai, bimbingan guru yang intensif, dan motivasi siswa yang tinggi. Faktor penghambat mencakup keterbatasan waktu praktik, kekurangan bahan, dan rasa takut melakukan kesalahan. Kesimpulannya, instrumen penilaian terstruktur serta metode pembelajaran yang fleksibel dan berorientasi industri mampu meningkatkan kompetensi psikomotorik siswa dan menjadi dasar pengembangan pendidikan vokasi yang adaptif.

1. Introduction

Education is a dynamic and continuous process aimed at developing human potential holistically, encompassing cognitive, affective, and psychomotor domains (Changiz et al., 2021). These three domains interrelate in shaping individuals who possess not only theoretical knowledge and positive attitudes but also the practical skills necessary for daily life and professional settings. In today's era of globalization and technological disruption, education systems face increasingly complex challenges. Graduates are no longer deemed competitive by theoretical mastery alone; instead, they must demonstrate adaptability, critical thinking, and the ability to apply knowledge in real-life, dynamic contexts (Mertayasa et al., 2023). Consequently, educational institutions are required to reform curricula, teaching methodologies, and assessment systems to generate human capital that meets contemporary demands.

Vocational education plays a pivotal role in this transformation by equipping learners with the technical skills and professional competencies aligned with industry needs (Yahya, Hidayat, and Wahyudi 2023). Distinct from general education, vocational training prioritizes hands-on experiences and applied knowledge. Among the core pillars of vocational learning is the psychomotor domain—an individual's ability to perform precise motor skills, execute technical tasks, and continuously refine those abilities through experiential practice (Changiz et al., 2021). Psychomotor skills do not emerge instantly; they require iterative engagement, active application, and scaffolded feedback. Ernawati (2022) underscores that in skill-based domains such as Fashion Design, a balance between conceptual (cognitive) and technical (psychomotor) competencies is essential for effective learning outcomes. Moreover, Panadero (2017) emphasizes the importance of self-regulated

learning strategies among vocational students, indicating that students with greater metacognitive awareness and planning skills tend to perform better in practice-based settings.

To address the evolving needs of Industry 4.0, vocational schools must constantly innovate in both curriculum design and instructional practice. Within Fashion Design education, students are expected to acquire intricate psychomotor skills such as sewing, fabric manipulation, pattern drafting, and machine operation (Muhitasari and Purnami 2022). Recent systematic reviews emphasize the relevance of integrating Industry 4.0 technologies in Technical and Vocational Education and Training curricula to align vocational training with emerging industrial demands (Putra et al., 2025; Siti Zaharah et al., 2018). These findings support the current need to incorporate technology-enhanced learning environments in fashion vocational programs. However, barriers such as limited practice time, outdated equipment, inconsistent student motivation, and varying levels of preparedness hinder skill acquisition (Irwanto, 2023). The literature highlights that relevant curriculum design, technology-enhanced instruction, and authentic practice environments significantly impact students' psychomotor development (Kim, Wang, and Boon 2021; Mertayasa et al. 2023). The adoption of active learning models—such as the flipped classroom, project-based learning, and constructivist pedagogies—has proven effective in promoting learner autonomy and skill mastery in vocational settings (Alamsyah et al., 2025). According to constructivist learning theory, knowledge is actively constructed through meaningful experiences, making hands-on learning environments particularly suited for psychomotor development in Fashion Design.

While these innovations are promising, there remains a notable gap in the literature concerning how psychomotor competencies are developed and assessed specifically within the context of Fashion Design education at vocational high schools. Much of the existing research emphasizes cognitive outcomes or general vocational readiness, leaving the nuanced trajectory of psychomotor growth underexplored. Furthermore, the integration of psychomotor assessment tools within a structured learning process—aligned with curriculum goals and industrial standards—has yet to be thoroughly investigated in the Indonesian vocational context.

Therefore, this study aims to analyze the development of psychomotor skills among Fashion Design students at SMKN 3 Kota Blitar. The research also seeks to identify the supporting and inhibiting factors that shape students' practical learning experiences. Using a descriptive qualitative approach, this study intends to bridge the aforementioned gap by offering evidence-based insights into adaptive and innovative pedagogical and assessment strategies, ultimately contributing to the preparation of globally competitive, skillful vocational graduates.

This study offers a novel contribution by providing a detailed, field-based analysis of psychomotor skill development in fashion design—a vocational domain that remains underexplored in Indonesian educational research. By incorporating multiple data sources and focusing on practical learning environments, the research enriches current understanding of how vocational curricula can be aligned with the dynamic needs of the creative industry.

2. Method

This study adopted a descriptive qualitative approach to obtain an in-depth understanding of psychomotor skill development among Grade XI Fashion Design students at SMKN 3 Kota Blitar. This research was conducted in the Fashion Design laboratory, focusing on student activities during hands-on practical sessions such as sewing, cutting fabric, and pattern design.

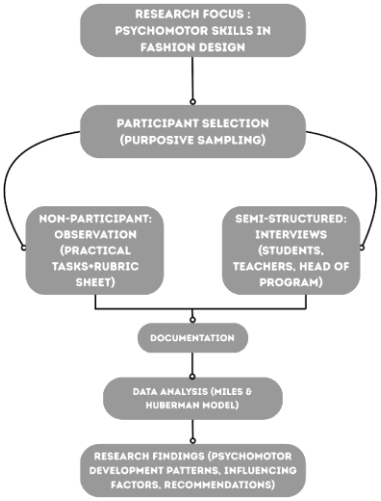

Figure 1. Research procedure.

Participants were selected using purposive sampling to ensure relevance and richness of the data. The sample consisted of:

- Twelve students (six with high and six with moderate-to-low psychomotor performance, based on teacher recommendations and practical scores), to reflect a range of skill development;
- Two vocational subject teachers, each with over five years of experience in practical instruction;
- One head of the Fashion Design program, responsible for curriculum planning and supervision.

The inclusion criteria for students involved active enrollment in Grade XI, regular attendance in practical sessions, and willingness to participate in interviews. This selection strategy ensured that the data collected was contextually relevant to the study's focus on psychomotor development and reflective of typical challenges and successes within the program.

Data Collection Techniques

Three complementary data collection methods were employed:

1. Non-participant observation, focusing on student performance during practical tasks. A rubric-based observation sheet was used to assess key indicators such as accuracy, speed, neatness, tool mastery, and hand-eye coordination;
2. Semi-structured interviews with students, teachers, and the program head to explore perceptions, challenges, instructional strategies, and supporting or inhibiting factors in psychomotor learning;
3. Document analysis, including student portfolios, lesson plans, syllabi, grading rubrics, and visual documentation (photos and videos) of student outputs. These served to triangulate data and provide contextual validation.

Data Analysis

Data were analyzed using the Miles and Huberman (1994) interactive model, which consists of three core activities:

1. Data reduction, where raw data were transcribed, organized, and simplified. Interview transcripts and field notes were coded manually using open coding techniques to identify meaningful units;

2. Data display, where emerging patterns and relationships were organized into visual matrices and thematic charts. Codes were grouped into subcategories such as "instructional support," "practice intensity," and "student motivation";

3. Conclusion drawing and verification, where the themes were compared across data sources for consistency and interpreted in light of existing theory and research.

To ensure trustworthiness, triangulation was employed across data sources (observation, interviews, and documents) and participant perspectives. Member checking was conducted with selected participants to validate interpretation accuracy. As emphasized by Suyitno, Wahyuningsih, and Faizah (2024), triangulation enhances the credibility of qualitative findings, while Ediyanto et al. (2025) argue that the integration of diverse data types fosters a more holistic understanding of psychomotor competencies in vocational contexts.

3. Results and Discussion

The findings revealed that students' psychomotor development followed a progression aligned with Simpson's psychomotor taxonomy, ranging from initial stages of imitation to more advanced levels of adaptation and creativity in sewing and design tasks (Nafiati, 2021). Initially, most students strictly followed instructors' demonstrations and patterns, but over time, they demonstrated increasing autonomy, precision, and innovation. This observed development trajectory reinforces the assertion by Putera and Shofiah (2021) that vocational education must prioritize product-oriented outputs, highlighting the urgent need for structured scaffolding in practical skill instruction.

Compared to dual system vocational education models implemented in countries like Germany or Japan, where workplace immersion is integrated into weekly curricula, the Indonesian model remains more classroom-bound. Future adaptation could benefit from such hybrid models, enhancing skill transferability and authenticity of learning (Roll & Ifenthaler, 2021).

A more detailed analysis revealed that students with prior exposure to informal industry experiences—such as working in family tailoring businesses—exhibited faster adaptation, greater technical confidence, and higher accuracy in executing tasks. This reinforces the role of experiential learning in enhancing psychomotor growth.

As depicted in Figure 2, students engage in tasks requiring fine motor control, such as hemming and seam alignment. These tasks require coordination, patience, and repetition, which form the core of psychomotor maturation.

Figure 2. Students engaged in sewing practice at the Fashion Design Lab, SMKN 3 Kota Blitar.

Supporting Factors and Their Impact

Among the most influential supporting factors were adequate laboratory facilities and intensive teacher guidance. The laboratory at SMKN 3 Kota Blitar was equipped with JUKI DDL-8100e industrial sewing machines, fabric cutting tables, mannequins, and sufficient lighting, which collectively created a conducive learning environment. These facilities not only allowed students to practice with tools similar to those used in the industry but also enhanced motor coordination and spatial awareness through repeated exposure to realistic design workflows. Students highlighted that access to well-maintained tools reduced anxiety and allowed them to focus on skill refinement.

Equally important was the individualized guidance provided by vocational teachers, who frequently corrected students' techniques during practice and provided formative feedback. This guidance was especially vital during complex tasks such as inserting zippers or aligning curved seams. Teacher feedback also reinforced cognitive connections between design theory and manual execution, accelerating skill retention. These observations align with the findings of Suparyati and Habsya (2024), who noted that relevant curriculum content, contextualized instruction, and communication between instructor and learner significantly influence vocational outcomes.

Challenges Faced by Students and Teachers

Another critical barrier faced by students was the persistent fear of making mistakes, particularly when engaging with costly fabrics or complex garment structures. This anxiety, while understandable, significantly stifles creative exploration and risk-taking, both of which are essential in developing higher-order psychomotor abilities. This finding aligns with the socio-cognitive perspective of M. Li et al. (2021), emphasizing that low self-efficacy can hinder motor performance. Similar results were reported by Chuang et al. (2022), who found that fear of failure in hands-on settings reduced learner engagement and innovation. Hence, creating psychologically safe learning spaces is vital in vocational settings where iterative trial and error is part of skill mastery. Kachina Studer (Chuang et al., 2022).

The findings further substantiate Zimmerman's (1990) theory of self-regulated learning, which emphasizes performance monitoring as a critical predictor of long-term mastery. This psychological barrier suggests the need for emotionally responsive pedagogy in vocational instruction—an area where teacher scaffolding and peer support can significantly mediate learning anxiety.

Figure 3. Documentation of Teacher and Student Interviews on Learning Barriers

Psychomotor Assessment and Its Role

The use of structured rubrics and observation sheets in this study contributed to objective and consistent evaluation of student performance. This approach aligns with recommendations by Ediyanto et al. (2025) and Maulana and Anshori (2024), who advocate for curriculum-integrated, transparent, and practical assessment tools. The rubrics used allowed for ongoing feedback and progress tracking, particularly in areas such as stitching quality, pattern accuracy, and equipment handling. Teachers noted that such structured assessments also helped them identify students needing additional support and tailor their interventions accordingly.

Recent international research emphasizes the importance of valid psychomotor assessment tools in vocational settings to ensure consistent skill measurement across varied learners (Sardi, Rahmat, and Yuliana 2023). As de Grynyov et al (2024) assert, standardized psychomotor assessments enhance reliability and validity in evaluating hands-on competencies across diverse vocational contexts. Aligning with Raihan Tahir and Zuraidah Abdullah (2024), integrating technology-enhanced learning environments in TVET curricula prepares students for digitalized industrial workflows and fosters future readiness. The repeated exposure to real-world scenarios during practice sessions enabled students to internalize industry standards and expectations, reinforcing vocational learning outcomes beyond academic theory.

This structured feedback mechanism echoes the principles of formative assessment widely adopted in OECD vocational education systems, where students progressively improve performance through iterative practice (Roll & Ifenthaler, 2021).

Comparative Insight and Implications

While the study focused on SMKN 3 Kota Blitar, a comparative perspective may offer deeper insights. Other vocational schools with alternative teaching models—such as integrated teaching factories or dual system partnerships with industry—may demonstrate different psychomotor development patterns. Future research could explore whether these models provide more accelerated or comprehensive psychomotor training and whether the results are consistent across various vocational fields such as Culinary Arts, Automotive, or Hospitality. According to Taofeek (2025), TVET curriculum reforms should directly address evolving labor market demands by integrating flexible modules and employability-focused training.

Strategic Implications for Practice

The findings suggest that vocational programs should adopt flexible, industry-oriented learning environments combined with robust psychomotor assessment strategies. Teachers should be encouraged to allocate time for independent projects and foster peer collaboration, reducing overdependence on direct instruction. Moreover, investment in teacher professional development—particularly in the design and application of psychomotor assessments—can ensure accurate skill evaluation and promote student-centered learning.

In sum, the results reinforce the strategic role of vocational education in bridging the gap between school and industry. As emphasized by Yahya, Hidayat, and Wahyudi (2023), preparing graduates with strong psychomotor and soft skills is critical for workforce readiness. In the context of fashion design, mastery of technical tasks such as pattern drafting, precise stitching, and tool operation are prerequisites for professional success (Dewi 2024; Muhitasari and Purnami 2022). Without these competencies, theoretical knowledge alone is insufficient to produce industry-standard garments. As noted by Roll and Ifenthaler (2021), the integration of Industry 4.0 concepts in vocational curricula requires not only infrastructure modernization but also alignment of teaching strategies with industrial digital workflows.

Furthermore, studies by Ernawati (2022; Rizki and Gea (2024) confirm that learning outcomes are significantly influenced by the integration of cognitive and psychomotor domains, particularly when supported by Computer-Aided Design (CAD) in fashion education. Consequently, psychomotor development must remain a central priority in curriculum design, pedagogical innovation, and assessment practice within vocational institutions. Adopting immersive VR training systems significantly improves task precision and learner confidence in skill-based training (V. Li et al., 2025; Lie et al., 2023).

This study is limited by its single-site focus and relatively small sample size, which may affect the generalizability of the findings. Additionally, the qualitative approach, while rich in depth, may be subject to researcher bias despite triangulation efforts. Future studies may expand the scope to include multiple vocational schools or apply mixed-method designs to validate findings on a broader scale.

3.1 Conclusion

This study concludes that the psychomotor skill development of Fashion Design students at SMKN 3 Kota Blitar demonstrates significant variation, influenced by individual factors such as prior hands-on experience, personal motivation, and the intensity of practice. Supporting elements, including adequate and industry-aligned laboratory facilities and intensive teacher guidance, were found to play a critical role in facilitating skill acquisition. In contrast, barriers such as limited practice time, inadequate availability of materials, and disparities in student readiness hinder optimal development. The structured use of observation rubrics, combined with triangulated data from interviews, observations, and documentation, enabled a comprehensive understanding of student competencies and their progression through various stages of psychomotor learning.

To ensure effective skill development, teachers are encouraged to adopt modular, project-based learning models that scaffold students' competencies gradually, implement flexible practice schedules such as open lab hours to accommodate diverse learning speeds, and establish peer mentoring systems to support collaborative learning. The use of reflective journals or student portfolios is also recommended to foster self-monitoring and enhance metacognitive awareness. For school administrators, efforts should be directed toward continuous investment in industry-standard tools and facilities, providing professional development opportunities focused on psychomotor-based pedagogy and assessment, and building partnerships with local industries to enrich learning through guest teaching or internship programs.

For future research, it is suggested to examine the long-term impact of psychomotor skills on graduate employability, adaptability in professional environments, and overall career growth. Comparative studies across vocational schools with different levels of practical implementation—especially those utilizing innovative or internationalized training systems—would provide valuable insights into scalable strategies. Furthermore, investigating the integration of emerging technologies such as augmented reality or AI-based design simulations in vocational training could open new avenues for enhancing psychomotor learning in fashion education.

This study offers strategic insights not only for curriculum planners and educators at SMKN 3 Kota Blitar but also for national policy makers aiming to standardize psychomotor assessment and training in vocational education across Indonesia.

Author Contributions

Surayanah: Advisor

Risa Yuliana Dewi: Conceptualization, Methodology, Investigation, Writing - Original Draft. Selvy Octavia Eka Putri: Data Curation, Formal Analysis, Writing - Review & Editing.

Tenarsya Prastama Putri: Visualization, Investigation. Moh. Ade Sohibul Maula: Resources, Supervision.

All authors have equal contributions to the paper. All the authors have read and approved the final manuscript.

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