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IMPROVING PSYCHOMOTOR COMPETENCE THROUGH PROBLEM-BASED LEARNING IN VOCATIONAL BEAUTY EDUCATION: GALA HAIRSTYLE ARRANGEMENT WITH HAIRPIECE COLLABORATION

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ABSTRACT

The increasing demand for professional hairdressers requires vocational education in beauty care to place greater emphasis on the development of psychomotor skills and creativity. This study investigates the effectiveness of Problem-Based Learning (PBL) in improving students' psychomotor skills in styling gala buns with hairpiece collaboration. A quasi-experimental design with a one-shot case study approach was used, involving 50 students taking the Hairpiece course. The PBL intervention was implemented through structured stages, including problem orientation, investigation, solution development, practical implementation, and reflection. Students' psychomotor competencies were evaluated using a valid performance rubric, covering design suitability, techniques & variations, creativity & innovation, proportion & balance, neatness & strength, and use of accessories. Data were analyzed using descriptive percentage analysis. The results showed that students achieved a very high level of psychomotor competency, with an average score of 81.725%. These findings indicate that PBL effectively improves technical accuracy, creative problem solving, and professional performance in advanced hairstyling practices. The uniqueness of this study lies in the integration of PBL into gala hairstyling with hairpiece collaboration, offering a pedagogical model that supports creative and skill-based learning in vocational beauty education.

KEYWORDS: PBL, Vocational Beauty Education, Psychomotor Competency, Gala Hairstyling, Hairpiece Collaboration.

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INTRODUCTION

In a rapidly changing modern society, people are increasingly interested in their own appearance and that of others according to their standards of beauty. People play an important role in expressing visual beauty through changes in appearance and determining their appearance. Modern society has become increasingly aware of the importance of appearance in the field of beauty in line with changing social and cultural trends in society. Appearance is a competitive advantage for modern people, so they need to devote time and effort to make their appearance a means of expressing beauty (Jang, 2018). Together with fashion, it has become a tool for expressing the values and cultural trends of the current era, making it a factor that cannot be ignored in social life [Park, 2020]. In an era where appearance and image are highly valued as personal attributes, it is no surprise that hairstyles are considered important for representing identity, as they can create diverse images and emphasize beauty.

The desire for beauty has increased with the changing times, and public values have been formed in various ways in relation to beauty in economics, politics, culture, and art (Lim et al., 2022). As a result of the development of the times, socio-economics, and changing trends, the level of aesthetics and consumer expectations have increased, as have demand and consumption, leading to many demands for beauty (Lee & Kim, 2020**)**. This has led to a continuous improvement in aesthetics and has also increased the requirements for makeup and hair modeling.

Hair, as an organic material and part of the human body, has been manipulated and styled throughout history. Hair has always had social significance for example, as a symbol of status or a fashion statement **(**Majali et al., 2017). Hair is similar to clothing in that it is easily manipulated, changed, and given meaning. According to Manning (2010), hair is a social construct closely related to female identity, and he describes hair as "part of a broader language of appearance that, whether intentional or not, tells others about ourselves."

Hair styling is a fashion art that has evolved since ancient times, influenced by various factors. It has become a major aspect of human lifestyle in different ways, along with the development of society (Lim, et al., 2022). According to Manning (2010), society's perception of hair evolves and changes along with the depiction of fashion in the media. The influence of popular culture in society gives meaning to various hairstyles, hair colors, and lengths that fluctuate. This makes hairstyling a focus of attention because it is considered a tool for expressing one's beauty that is easy to style and change (Lee & Kim, 2020).

Essentially, hairstyling is a final process of hair treatment aimed at creating an impression of beauty, neatness, and harmony for an individual(Jang, 2018) . Hairstyle is an important element of appearance. Even if one wears the most beautiful clothing but has messy hair, they will not look attractive. Thus, hair styling is the process of designing or arranging hair according to a basic pattern based on good cutting, styling, or arrangement that matches the clothes worn. Therefore, hair designers need to quickly understand information about the condition of the customer's hair and their preferred style through communication with the customer, and provide accurate hair styling with the right methods and procedures (Byeon & Koo, 2020).

According to Park (2020), hairstyles, which determine a person's first impression and play a significant role in image transformation, are tools that represent not only an individual's personality, character, and values but also contemporary culture. This is also emphasized by Sunhem & Pusupa (2016), who state that choosing a good hairstyle for women is crucial as it can enhance beauty, personality, and self-confidence. One can change their hairstyle and express their beauty if they can adapt their hairstyle to the contours of their face (Kyeong & Hwa, 2006). According to Palladino, (1989), the main purpose of hairstyles is to enhance the wearer's appearance and boost their spirit and self-confidence, which must also be adapted to the occasion, such as work, casual events, special events, or formal events. Therefore, it must be part of a complete ensemble, including clothing, makeup, and accessories. This is also stated by Liu, et al. (2019), that hairstyle is an expression of form or shape achieved by arranging the hair into balanced lines that complement the underlying structure of the head and face. Hairstyle is an important indicator that affects facial value, which has a significant impact on a person's work and life. Hairstyle is formed as a complete unity, not merely a simple expression of beauty, through the combination of visual characteristics from various hair design elements. Hair design elements include shape, texture, and color, where the visual characteristics of these elements serve as important visual media in shaping the overall image of a hairstyle (Park, 2020). Therefore, a hairstyle that suits the shape of the face is an essential requirement for improving a person's external image. However,

modern people who pursue various images are not satisfied with just one style and want to change themselves with different hairstyles (Kyeong & Hwa, 2006).

Based on this, mastery of hair styling related to hair design/style, types, characteristics, techniques, and procedures must be mastered by beauty students, as this is related to the achievement of competencies at the end of learning and readiness to enter the workforce. This is in line with the objectives of vocational education, which is to prepare students for the job market with up-to-date professional knowledge, ranging from basic skills, problem-solving skills, to the right work attitude, work skills, technical skills, and other vocational skills (Yeh Ju-Hsuan, et.all, 2021). Although creativity can grow and develop through practice, in reality, in the process of learning hairpieces/hair styling, teachers still provide many examples or demonstrations of hair styling. This causes students to lack independent development through creative thinking in discovering problems in hair styling. This is also stated by Ulger (2018) that creative thinking is very helpful in determining new solutions to unexpected difficulties or problems. Creative thinking skills are the ability of students to understand problems and find solutions using various strategies or methods acquired in the learning process. Thus, creativity plays an important role in the field of innovation, as individuals create new products, ideas, and establish appropriate techniques that are not only new but also valuable.

Creative hairwork, which has been established as a new art form in modern society, has developed into a field of beauty that prioritizes technology and function, expanding the range of artistic expression that cannot be fulfilled by practical technology, thus enabling new designs that continue to improve (Lim, et al., 2022). Therefore, developments based on design or theme can be made for hairstyling. Hairstyle design is the implementation of the overall plan to create hair shapes such as length, color, waves, and hair design elements (Lee & Park, 2008). One of the most important factors to consider when choosing the right hairstyle is the individual's face shape. Face shapes are categorized into five different types: round, oval, oblong, square, and heart-shaped (Sunhem & Pasupa, 2016). Thus, creativity is essential in hair styling, especially in bun styling.

The bun is one of the most iconic hairstyles in the world, with a history stretching back centuries (Palladino, 1989) . A bun is a hairstyle created by rolling or tying the hair back at the back of the head to look neat, which often has symbolic meaning in various cultures. In addition to being a hairstyle, buns can also be a sign of maturity, status, or part of traditions and rituals (Rigoletto et al., 2016). One type of hairstyle that has high aesthetic value is the gala bun, which requires creativity, technical skills, and an understanding of design principles. To create an elegant and distinctive bun, the ability to combine various techniques is required, including the use of hairpieces as collaborative elements. In general, the term hairpiece refers to false hair worn on the head for makeup or decoration purposes (Lim, et al., 2022). Hairpieces are partial wigs that have been used for a long time for specific purposes such as makeup, decoration, stage styling, ceremonies, and judging. This is also stated by Rigoletto et al. (2016) that gala styling is an updo with a complex design. Gala styling is done with variations using hairpieces and additional accessories according to creativity and is done with several basic hair styling techniques such as braiding, twisting, buckling, and also sasak. This challenge requires beauty students to not only master basic techniques but also be able to innovate according to developing fashion trends and collaborate with various styling and coloring techniques using hairpieces equipped with the necessary accessories to enhance appearance.

In realizing successful learning, especially in training students to be independent and able to think creatively, the Problem-Based Learning (PBL) model is one of the learning strategies chosen to improve the quality of hairpiece courses, especially in bun styling. This is in accordance with the statement by Amerstorfer et al. (2021), that PBL is a collaborative learning method commonly used in higher education and is suitable for various disciplines. In line with Susan (2021), PBL applies the principles of constructivism to encourage the application of prior knowledge, collaborative learning, and active involvement. PBL involves students in facing real problems and trains them to find solutions to the problems they encounter, ranging from small, challenging to complex problems. PBL is a learning method developed from active learning (Ulger, 2018). According to Silva et al. (2018), PBL requires learners to change their mindset from dependence on teachers to independence. Widowati (2023) also states that learners' creative abilities are not only obtained from teachers/educators but must also be acquired through active searching and interaction in the learning process. This can be done by training students to , find, and analyze problems, make

hypotheses, collect data, and determine alternative solutions. Through a series of systematic and structured learning activities, it is hoped that learning experiences, metacognitive development, creativity, and problem-solving skills in hairpin styling can be improved through direct practice on models. This is also emphasized by Amerstorfer et al. (2021), who state that problems should be interesting, realistic, and relevant to students and their future careers.

This research was designed with a quantitative descriptive approach using a quasi-experimental research design that employed the PBL learning model in one group. Through this research, it is hoped that an objective understanding of the increase in creativity or psychomotor skills in solving problems related to gala hair styling among students can be obtained. Thus, it can also make a positive contribution to educators in developing contextual learning in line with industry needs and developments in the field of hair styling. On the other hand, through PBL, students can get used to thinking creatively, coming up with new and creative ideas related to hair styling, as well as providing experience and improving their professional competence or skills in accordance with the objectives of vocational education.

Various previous studies have shown that the application of PBL in various fields of education has been proven to increase creativity (psychomotor), critical thinking skills, and problem-solving skills in learning. Silva's (2018) research results show that the PBL learning strategy for undergraduate management students at a federal university in Northeast Brazil has positive implications for learning because it demonstrates the integration of theory and practice, which increases learning motivation. PBL can transform students into active subjects in their own learning and develop decision-making skills through the identification and analysis of real problems. Kardoyo et al. (2020) stated that their research results on the application of problem-based learning methods in management information systems courses can improve the critical and creative thinking skills of students in the Faculty of Economics, Semarang State University. Students were able to solve the cases given by conducting appropriate analyses and providing alternative solutions. Students even considered the learning process to be more interesting and challenging. This highlights the importance of applying this model in learning how to arrange hairpieces so that students become more independent and creative and can make decisions and solve problems in arranging hairpieces, which are also needed in the world of work. Based on this, further research is needed on the application of PBL in beauty styling education, particularly to enhance professional skills in the psychomotor aspect of gala hairstyling with hairpiece collaboration.

METHODOLOGY

Research Design

This study uses a quasi-experimental research design with a one-shot descriptive quantitative case study. The chosen design aims to test the effectiveness of Problem-Based Learning (PBL) in improving students' psychomotor competencies in gala hair styling with hairpiece collaboration. Although this design does not include a control group or pre-test, it allows for in-depth observation of learning outcomes after the implementation of structured instructional interventions.

The selection of a single case study design was based on the instructional context of vocational beauty education, where learning outcomes are largely performance-based and evaluated through direct observation of practical skills. This design is suitable for exploratory pedagogical studies that aim to assess instructional effectiveness in authentic classroom environments **(**Sugiyono, 2019**).** In addition, the focus on post-treatment assessment is in line to evaluate the direct impact of PBL on students' creative and psychomotor performance.

Research Participants and Environment

The participants in this study consisted of 50 beauty education program students who were taking the Hairpiece course. These students had completed basic hairdressing training, so they had the basic technical skills necessary for advanced hairpin styling practice.

This research was conducted in a hairdressing laboratory equipped with standard professional tools, models, wigs, and accessories commonly used in making gala hairpieces. This environment was designed to mimic a real professional environment, thereby enhancing the authenticity of the learning experience. All students were given the same learning materials, learning duration, and assessment criteria to ensure consistency.

Implementation of Problem-Based Learning

The implementation of Problem-Based Learning (PBL) in this study follows a structured sequence that is in line with the established PBL framework, while being adapted to the specific demands of gala

hairstyling. The learning process begins with problem orientation, where students are presented with authentic hairstyling scenarios, such as designing a gala hairstyle for clients with different face shapes, event themes, and hair conditions. These scenarios require students to identify design constraints and aesthetic considerations, encouraging them to critically analyze the context of the problem.

In the problem investigation stage, students work collaboratively in small groups to explore possible design solutions. They gather information related to sanggul structure, hair accessory selection, color harmony, and accessory placement through discussion, reference materials, and peer consultation. This stage emphasizes exploration, discovery, and the construction of shared knowledge.

The next phase involves solution development and practical implementation, where students transform their conceptual designs into actual gala hair bun styles. Students independently choose techniques, combine natural hair with hairpieces, and apply appropriate styling techniques such as braiding, twisting, tying, and backcombing. Instructors act as facilitators, providing guidance only when necessary and encouraging students to justify their design choices.

After the practical implementation, students participate in a presentation and reflection activity. Each group presents the hairstyle they have completed, explaining the design rationale, techniques used, and problem-solving strategies. Feedback from classmates and instructor comments are used to encourage reflective thinking and self-evaluation. This reflective phase allows students to recognize their strengths and identify areas for improvement, reinforcing metacognitive development.

Through this structured PBL process, students are actively engaged in solving realistic hairstyling problems, developing independence, creativity, and professional competence.

Measurement Tools and Data Collection

Data was collected using a performance test designed to assess students' psychomotor competencies in styling gala buns with hairpiece collaboration. The assessment tool was a performance rubric consisting of 24 indicators evaluated using a four-point Likert scale, ranging from 1 (very low) to 4 (very high).

The rubric covers six main competency dimensions: (1) design and theme suitability, (2) neatness and shape durability, (3) technique and variation, (4) proportion and balance, (5) creativity and innovation, and (6) use of accessories. These indicators were developed based on professional hairstyling standards and the learning outcomes of the Hairpiece course.

Performance assessment was conducted after the completion of the PBL intervention. Each student's work was evaluated through direct observation, ensuring that the assessment reflected actual skill performance rather than theoretical knowledge.

Validity and Reliability of Measurement Tools

To ensure the quality of the assessment instrument, construct validity was established through expert review. Six hairstyling experts with professional and academic experience evaluated the relevance and clarity of each rubric indicator. The validity of the instrument was confirmed using product-moment correlation analysis, with all items showing correlation coefficients exceeding the critical value of $r = 0.285$, indicating adequate validity.

The reliability of the instrument was tested using Cronbach's alpha, resulting in a reliability coefficient of 0.754. This value exceeds the acceptable threshold of 0.60, indicating a high level of internal consistency and reliability. These results prove that the performance rubric is valid and reliable for assessing psychomotor competence in gala bun hairstyling.

Data Analysis

Data analysis was conducted using descriptive percentage analysis to interpret the level of psychomotor competence of students after the PBL intervention. The scores obtained from the performance test were converted into percentage values and categorized according to the predetermined competence criteria: very high, high, moderate, and low, as shown in Table 1 below.

Table 1. Psychomotor competency percentage criteria

Interval	Criteria
82% ≤ Na < 100%	Very High
63% ≤ Na < 81%	High
44% ≤ Na < 62%	Moderate
25% < N ≤ 43%	Low

This analytical approach was chosen to provide a clear and interpretable representation of students' skill performance across various competency dimensions. The use of descriptive analysis is appropriate for performance-based assessment in vocational education, where the main objective is to evaluate skill achievement in order to draw causal conclusions.

RESULTS AND DISCUSSION

Results of Psychomotor Competency Assessment

In accordance with the data analysis steps in this study, descriptive percentages were used to observe improvements in psychomotor aspects after implementing problem-based learning (PBL) to enhance creativity in hair styling, particularly gala hair styling using hairpiece collaboration techniques. The results are presented in the following table:

Table 2. Results of the psychomotor aspect measurement.

Indicator	%	Category
Design & Theme Alignment	84.6%	Very High
Neatness & strength	82%	Very High
Technique & Variation	82.5%	Very High
Proportion & balance	78%	High
Creativity & innovation	79%	High
Accessory usage	84.25%	Very high
Average	**81.725%**	**Very High**

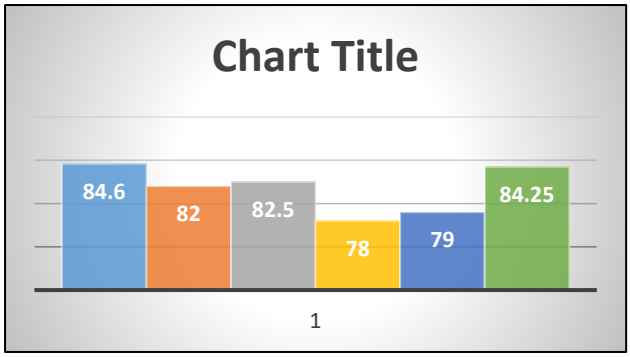

Figure 1. Assessment of Gala Hairstyle Arrangement with Hairpiece Collaboration

The results of this study indicate that the application of Problem-Based Learning (PBL) in gala hairstyling with the collaborative use of hairpieces produces a very high level of psychomotor competency among students. Descriptive percentage analysis shows an overall average score of 81.725%, which falls into the very high competency category. These findings indicate that PBL effectively supports students in achieving advanced hair styling skills that combine technical precision, aesthetic judgment, and creative problem solving.

In terms of individual competency indicators, students showed very strong performance in design and theme suitability (84.6%), neatness and strength (82%), technique and variation (82.5%), and use of accessories (84.25%), all of which were classified as very high. These results reflect the students' ability to translate conceptual design considerations into good hairstyling outcomes, a key indicator of professional readiness in vocational beauty education.

Meanwhile, proportion and balance (78%) and creativity and innovation (79%) were categorized as high, although slightly lower than the other indicators. These results are understandable given the complexity of achieving aesthetic harmony and authenticity in advanced bun styling design. These dimensions require not only technical mastery but also a subtle artistic sensibility, which develops gradually through experience.

Integration of PBL Stages into Hair Styling Performance

The high level of psychomotor competence observed in this study can be attributed to the structured implementation of PBL stages throughout the learning process. In the problem orientation stage, students are presented with realistic hairstyling scenarios that require them to design gala hairstyles based on specific client characteristics, such as face shape, hair condition, and event theme. This initial exposure encourages students to think analytically about design constraints and aesthetic goals before practical execution.

In the problem investigation stage, students collaboratively explore various hairstyling techniques, hairpiece options, and accessory use. This stage facilitates knowledge sharing and critical evaluation of alternative solutions, allowing students to expand their technical repertoire. The collaborative nature of this phase also contributes to the development of professional communication skills, which are essential in the context of real-world hairstyling.

The solution development and implementation stage plays a key role in improving students' psychomotor competencies. By allowing students to choose techniques and designs independently, PBL encourages independence and decision-making. Students show improvement in applying advanced techniques such as braiding, twisting, smoothing, and using hairpieces, which directly contributes to high scores in neatness, durability, and technique variety.

Finally, **the presentation and reflection stage** reinforces learning outcomes by encouraging students to articulate their design rationale and evaluate their performance. Reflection allows students to absorb feedback, identify areas for improvement, and refine their aesthetic judgment. This reflective practice is in line with constructivist learning principles and supports long-term skill development.

Developing Creativity Through PBL in Gala Hair Design

Creativity and innovation are essential competencies in contemporary hairstyling, especially

in gala hair design, which demands originality while adhering to aesthetic standards. The findings of this study show that PBL effectively facilitates creativity development by providing students with opportunities to experiment, take risks, and explore various design solutions.

Unlike traditional demonstration-based teaching, PBL shifts the focus of learning from imitation to exploration. Students are not limited to imitating the instructor's examples but are encouraged to develop personal designs that reflect their creative identities. This pedagogical shift explains the high creativity and innovation scores observed in performance assessments.

The integration of hair accessories further expands creative possibilities by allowing students to manipulate volume, texture, and shape beyond the limitations of natural hair. Through problem-solving activities, students learn to use hairpieces not only as complementary tools but as integral design elements. This approach is in line with Lim et al. (2022), who emphasize hairpieces in expanding artistic expression in modern hairstyling.

Comparison with Previous Studies

The results of this study are consistent with previous studies that show the effectiveness of PBL in improving learning outcomes in various disciplines. Silva et al. (2018) reported that PBL increases student motivation and the integration of theory with practice, while Kardoyo et al. (2020) found a significant increase in critical and creative thinking among college students.

However, this study expands the existing literature by applying PBL in a practical context oriented toward motor skills in vocational beauty education. Unlike many PBL studies that focus on cognitive outcomes, this study provides empirical evidence of the impact of PBL on professional hairstyling skills, specifically in advanced gala hairstyling with the collaborative use of hairpieces. This distinction represents a meaningful contribution to vocational education and creative arts pedagogy.

Uniqueness and Contribution of the Study

The uniqueness of this research lies in its integrative approach, which combines Problem-Based Learning (PBL) in gala bun styling with hairpiece collaboration to improve psychomotor competencies in vocational beauty education. While previous research has explored PBL in theoretical and cognitive domains, this study demonstrates its effectiveness in developing complex performance-based skills that require technical precision, creativity, and aesthetic judgment.

Additionally, this study introduces a PBL implementation model tailored to the context of hairdressing education, aligning PBL stages with professional hairdressing competencies. By explicitly mapping problem orientation, inquiry, implementation, and reflection into design appropriateness, technique variation, and creative innovation, this study offers a pedagogical framework that can be adapted to other practical and artistic disciplines.

From a practical perspective, these findings provide valuable insights for educators in beauty vocational programs aiming to enhance professional readiness through collaboration. This study highlights PBL as an effective teaching strategy for developing independent, creative, and competent hairdressers who can respond to the evolving demands of the industry.

CONCLUSION AND IMPLICATIONS

Conclusion

This study concludes that the application of Problem-Based Learning (PBL) is effective in improving psychomotor skills and creativity in gala hairstyling with the collaborative use of hairpieces among vocational beauty education students. The very high overall competency scores indicate that PBL supports collaboration in achieving professional-level hairstyling performance that combines technical precision, aesthetic balance, and creative innovation.

The structured stages of PBL encourage students to actively engage in problem analysis, collaborative exploration, independent implementation, and reflective evaluation. This process enables students to move beyond imitation-based learning towards creative and independent hairstyling practices. These findings confirm that PBL is well suited to advanced hairstyling education, where complex skills and artistic judgment are required.

Theoretical Implications

From a theoretical perspective, this study extends the application of constructivist learning theory and Problem-Based Learning (PBL) to the psychomotor domain in vocational beauty education. By demonstrating the alignment between PBL stages and hairdressing competency indicators, this study provides a conceptual framework for understanding how problem-based instruction can facilitate the development of performance-based creative skills.

Furthermore, this study contributes to the literature by highlighting the role of PBL in developing creativity in practical arts disciplines, an

area that has not received much empirical attention. The integration of hairpiece collaboration as a design challenge enriches existing discussions on creative skill development in vocational education.

Practical Implications

Practically, these findings provide valuable guidance for educators and curriculum developers in vocational beauty programs. Integrating PBL into hairdressing education can enhance students' professional readiness by encouraging independent thinking, flexibility, and creative confidence. Educators are encouraged to design authentic hairdressing problems that reflect real industry demands and facilitate a learning environment that supports experimentation and reflection.

The instructional model proposed in this study can also be adapted to other practical beauty disciplines, such as makeup artistry, bridal hairstyling, and traditional hairstyling, thereby expanding its application in the field of creative vocational education.

Limitations and Future Research

Despite its contributions, this study has several limitations. The use of a single case study design without a control group limits the ability to establish causal relationships. Future research could use experimental or mixed designs, incorporate pre- and post-tests, and include qualitative data to capture students' learning experiences more comprehensively.

Further studies are also recommended to explore the long-term impact of PBL on professional performance and investigate its effectiveness in various cultural and educational contexts within the beauty industry.

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