Learning History through Making: Project-Based Learning and Embodied Historical Knowledge in Vocational Fashion Education for Theatre Community

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Abstract. This study examines how Project-Based Learning (PBL) generates historical knowledge differently across student roles within a cross-disciplinary, academic-industry collaboration in vocational fashion education. Based on a collaboration between Politeknik Kreatif Indonesia (ESMOD Jakarta) and Yayasan Teater Abang None Jakarta (Teater Abnon), the study observes how students from the Creative Business and Fashion Design programs engaged with Indonesia's pre-independence visual and material culture through distinct but interconnected roles within a single PBL cycle. The project centred on the preparation of Gelora Muda, a stage production by Teater Abnon depicting Indonesian youth struggle surrounding the pre-independence period. Creative Business students initiated the cycle by conducting digital research on the period's visual context, producing a research deck that served as the design foundation for the Fashion Design students, who then interpreted, reconstructed, and materialised this knowledge into costume prototypes for the production's historical-timeline characters. The study draws on David Kolb's Experiential Learning Cycle as an a priori analytical framework and hybrid thematic analysis as the coding method, mapping student learning across both programs. Data were collected through visual documentation, including sketches and photographic records; two retrospective focus-group discussions with photo elicitation conducted separately with each student group; and an online interview with a Teater Abnon representative, whose perspectives as collaborator and cultural practitioner helped triangulate the student accounts. A clear asymmetry between the two student groups was revealed in the findings, where the Creative Business students, who engaged with the material solely through digital research, confirmed their prior assumptions and knowledge about the assigned period, with little change in understanding after the project ended. By contrast, the Fashion Design students, pushed by the naturally iterative demands of making, underwent genuine historical knowledge transformation, developing contextual understanding such as the factors influencing why people dress the way they did rather than merely what the era looked like. This study suggests that, within this single case, cross-disciplinary, cross-program collaboration between vocational students and a theatre community as a cultural industry partner can support a participatory, embodied, and socially grounded approach to history education. However, the effect can become more significant when it involves direct, making-based engagement within the learning process. In this case, the relatability of the historical context to the learners' national identity also enhances understanding through its

© The Author(s) 2026
I. W. P. Utami and A. J. Abdilla (eds.), *Proceedings of the 3rd International Conference on History, Social Sciences, and Education (ICHSE 2026)*, Advances in Social Science, Education and Humanities Research 1037,
https://doi.org/10.2991/978-2-38476-624-6_22

particular resonance in Indonesia, where the pre-independence era remains a living part of its cultural and civic identity.

Keywords: Embodied Historical Knowledge, Experiential Learning, Costume Design, Project-based Learning, Vocational Fashion Education.

1 Introduction

One of the long-standing debates in education is how the act of making and knowing relate to each other. However, there is still a lack of documented, specific implications of both learning processes for historical education in vocational creative programmes, particularly fashion. Existing approaches to fashion history education have significantly relied on passive image-based instruction or presentation, leaving students with visual literacy about the past yet occupying limited capacity to engage with it physically or professionally [4], [5]. Project-based Learning (PBL) offers a promising alternative, but the mechanisms by which it generates historical knowledge, particularly when students occupy different roles within the same project, have not been systematically examined.

This study addresses that gap through a cross-disciplinary collaboration between Creative Business (CB) and Fashion Design (FD) students at Politeknik Kreatif Indonesia (ESMOD Jakarta) and Yayasan Teater Abang None Jakarta (Teater Abnon). Both groups engaged with the same historical context—Indonesia's pre-independence era—but through fundamentally different modes of participation, where CB students worked as the researchers and FD students as the makers.

Using Kolb's Experiential Learning Cycle (ELC) [2] as an analytical framework and hybrid thematic analysis as the analytical method, the study finds that making functions as a generative mechanism for embodied historical knowledge, producing iterative inquiry, genuine knowledge transformation, and contextual historical understanding that research reception alone did not yield. The theoretical and practical implications of these findings for cross-disciplinary PBL design in vocational fashion education are discussed in the concluding section.

2 Literature Review and Theoretical Framework

2.1 Project-Based Learning in Vocational Creative Education

Project-Based Learning (PBL) is widely recognised as one of the paradigms that is increasingly adopted in vocational education and training (TVET) today [1–3]. Unlike traditional methods that focus on the transmission of theoretical knowledge, PBL emphasises active learning through the execution of complex, real-world projects that challenge students to apply the information and skills they have acquired across their curriculum [4, 5].

A fundamental characteristic of PBL is the transformation of roles within the classroom. It shifts the educational focus from a teacher-centred model to a student-centred approach, where the teacher no longer acts as the sole source of knowledge, but instead serves as a facilitator, guide, and mentor [5–7]. In this

capacity, educators facilitate investigation and dialogue, helping students navigate the frustrations and authentic challenges that arise during professional-level projects [4–6].

This pedagogical shift is instrumental in fostering 21st-century skills essential for the creative industries. Evidence suggests that PBL effectively enhances critical thinking, problem-solving, communication, and collaboration [2, 3]. Furthermore, it is a powerful tool for stimulating creativity and innovation, encouraging students to step outside their comfort zones to find original solutions to unfamiliar issues, as this is a process that requires them not only to acquire knowledge and produce ideas, but also to design, analyse, and apply them [5, 7, 8]. Alongside foundational technical knowledge, these soft skills can strengthen how well professional success is predicted in vocational creative subjects [3, 6, 9].

While implementations of PBL are often conducted within a single discipline, there is a particular potential for PBL to be extended across programs or disciplines by incorporating different student roles within a shared project cycle. With such a setting, the different competencies among the students could create distinct contributions while they work towards a common outcome. This dynamic condition also reflects a real industry situation, where specialists collaborate with other roles instead of working in isolation [3, 5]. PBL with a cross-program approach develops the students' capacity to communicate, negotiate, and synthesise knowledge across professional boundaries, which are increasingly recognised as valuable competencies in the creative industries, on top of enriching their learning experience through exposing them to perspectives outside their own discipline [1, 2].

2.2 Empiricism, Experiential Learning, and Embodied Knowledge Construction

PBL, understood as an embodied practice, traces back to a much older philosophical lineage. Contemporary scholars have pushed back on the traditional reading of Lockean empiricism as passive tabula rasa or "blank slate", instead arguing that what Locke was really concerned with was not perception's mechanics, but the more practical question of how understanding shapes human conduct and judgment in the world [10]. In doing so, this reframing departs from the Cartesian divide that much of a standard empiricism rests on, the idea that mind and body function as two separate instruments, with one designed for sensing the world, and the other receiving knowledge from it [11]. Because Locke centres human understanding as a guide for conduct rather than as mere perception, his work points toward a mode of learning that is both deliberate and embodied, which engages with the material world and becomes essential to knowledge itself [10].

This transition from philosophical conduct to active pedagogy is grounded in John Dewey's classic principle of "learning-by-doing", the idea that knowledge lasts longest when it is built through action and the enrichment of present experience, as opposed to being passed down as pre-existing fact [3, 5, 12]. Such engagement is systematically mapped through David Kolb's Experiential Learning Theory (ELT), which defines learning as a continuous process where "knowledge is created through the transformation of experience". It begins with Concrete Experience (CE), in which the learner acquires new information through immediate sensory immersion and the

"tangible, felt qualities" of the world [13]. This is followed by Reflective Observation (RO), in which the learner reflects on the experience and organises data from different perspectives. In the Abstract Conceptualisation (AC) stage, these reflections are synthesised into generalisations or sound theories that integrate observations to guide future action. Finally, the cycle moves to Active Experimentation (AE), where the learner tests these theories in new, more complex situations, eventually re-entering the Concrete Experience stage in an iterative loop. For learning to be truly effective, the individual must experience the entire cycle, although they may enter the model at any stage [13].

While Kolb's cycle is often applied to individual learners, it can equally describe a collective learning process in which different participants contribute to different stages of the cycle. In a cross-program project, for instance, one group may initiate the cycle through research and contextual inquiry, the Concrete Experience stage, while another group enters at their own Concrete Experience stage before interpreting that research and translating it into tangible outcomes through the remaining stages, albeit one mediated through the first group's research output [13, 14].

Unlike traditional educational paradigms that prioritise rote memorisation without consciousness or subjectivity, these experiential frameworks involve the student in their whole entity, integrating their feelings, perspectives, and emotions alongside their intellect [15]. By requiring the learner to move through a cycle of concrete experience and active experimentation, these pedagogical perspectives treat the individual as a synthesised acting, feeling, and thinking being in the world. Fashion design education makes this concrete: how students engage with material, process, and collaboration becomes a set of interconnected ways of knowing.

What ties these theoretical frameworks together, ultimately, is a shared premise, in which perception precedes reasoning, and knowledge takes shape in both mind and body at once [11, 16]. Drawing on Merleau-Ponty's phenomenology, perception is an active process through which we come to understand reality [17]. Vocational fashion and costume design education already embodies this integration by nature, where students naturally cycle between research, visualisation, and physical construction as part of the discipline [5, 18]. Where experiential projects push further is in demanding that perception be translated into tangible outcomes under real constraints, closing the gap between how something appears on paper and how it actually has to perform in the world for a given purpose or context [11, 19, 20].

2.3 Costume Design and Fashion History Education

Fashion design and costume design share the same technical foundation in garment construction, yet the two fields pull in different conceptual and professional directions [18, 21, 22]. Where fashion design chases market novelty and current trends, theatre costume design works instead as a visual communication tool, bringing a script to life through character traits, specific eras, and narrative mood. This is why education in the field cannot stop at dressmaking alone, but students also need to interpret how people from a historical period acted and carried themselves, both visually and verbally, in order to pull an audience into a theatre production's imaginary world [21, 22]. Fashion history education has traditionally leaned on lecture-based models, with

students passively viewing images. However, that approach has been shifting, as contemporary pedagogy increasingly turns to student-centred strategies such as PBL to connect historical theory more directly with professional practice [5, 6, 23]. This approach transforms students from passive recipients into active inquirers, enabling them to construct historical understanding through investigation and develop higher-order thinking skills, including analysis, evaluation, and synthesis, which are essential for interpreting historical narratives within a creative professional context [24].

Today's educational landscape treats curated digital research as a legitimate, standard mode of historical inquiry that builds advanced visual literacy and independent exploration in students [25]. In theatre costume design, this approach lets students synthesise complex historical contexts effectively and carry that understanding through into design outcomes that are relevant and grounded, keeping their theoretical grasp both rigorous and in step with modern professional standards [3, 25].

Furthermore, interdisciplinary collaboration is a vital component of theatre costume design education, as it forces students to move beyond unilateral decision-making to navigate external constraints and diverse artistic visions [20]. When student designers collaborate with choreographers or theatre makers, they must account for performability, the capacity for a garment to support movement requirements, such as large lifts in dance, while maintaining its visual impact [20, 21].

This collaborative process functions as a kind of real-world laboratory for professional practice where students have to navigate constant contingencies, strict production deadlines, and a production concept's specific aesthetic demands [5, 21, 22]. These multidisciplinary exchanges also give learners a deeper appreciation for how a design's appearance connects to its physical performance on stage, keeping historical iconography tethered to practical production realities instead of existing in the abstract [20].

Collectively, these frameworks situate the present study at the intersection of embodied pedagogy, vocational practice, and cross-disciplinary collaboration, examining whether and how a theatre-based PBL can generate historical knowledge through the act of making.

3 Method

3.1 Research Design

This study employs a qualitative case study design to examine how PBL generates historical knowledge across two student groups within a single, bounded institutional collaboration. Qualitative case study methodology is appropriate because the central concern is the understanding of how and why learning occurred within a specific, contextually rich setting [26]. The case in which a theatre costume design project was undertaken by students from two vocational programs at Politeknik Kreatif Indonesia (ESMOD Jakarta) in collaboration with Yayasan Teater Abang None Jakarta (Teater Abnon) represents a unique instance of cross-disciplinary, industry-partnered PBL that offers deep insight into the mechanisms of embodied historical knowledge construction.

For this purpose, data were collected through three instruments: visual documentation of the project process; retrospective focus group discussions (FGDs) with photo elicitation among student participants; and a semi-structured interview with a Teater Abnon representative for triangulation. Then, data were analysed using a hybrid approach of inductive and deductive thematic analysis, following Fereday & Muir-Cochrane (2006), who describe a staged process of coding that integrates theory-driven codes developed a priori with data-driven codes that emerge from the material itself. Kolb's Experiential Learning Cycle (ELC) served as the a priori deductive template for organising initial codes, while additional inductive codes were developed where data revealed patterns that could not be accommodated by the framework. This hybrid approach allowed the study to map student learning processes systematically across both programmes while remaining open to findings that emerged organically from the data.

3.2 Research Context and Project Description

This study is situated within a PBL initiative conducted at Politeknik Kreatif Indonesia (ESMOD Jakarta), a vocational higher education institution offering programmes in Fashion Design and Creative Business. In October 2025, students from both programmes were invited to participate in a collaborative production project with Yayasan Teater Abang None Jakarta (Teater Abnon), a Jakarta-based theatre organisation dedicated to promoting Betawi and Indonesian cultural heritage through performing arts.

This project centred on Gelora Muda, Teater Abnon's stage production commemorating Hari Sumpah Pemuda (The Youth Pledge Day), depicting the spirit and struggle of Indonesian youth in the years surrounding the pre-independence period in Indonesia. The production follows a group of contemporary Jakarta youth navigating questions of cultural identity and national heritage across iconic historical sites in the city. Structured around two parallel timelines (the present and the pre-independence era), the production moves between scenes of modern youth and flashback sequences depicting the struggle of Indonesia's young generation in the pre-independence years. Students from both programmes then contributed costumes for characters across both timelines; however, this study focuses specifically on the students who developed costumes for the characters from the past, as this group engaged most directly with the historical research and making process that forms the subject of this inquiry.

Within this project, the two student groups occupied distinct but interconnected roles that map onto different stages of Kolb's ELC. Creative Business (CB) students were tasked with conducting historical research digitally on the period's visual context, including clothing silhouettes, colour palettes, and social dress codes. After that, they synthesised their findings into a research deck that served as the design foundation for the Fashion Design (FD) students. Under the direction of the lecturers, who served as the project facilitators, FD students then received this research deck as their starting point, from which they developed sketches of original theatre costume designs, constructed the patterns, and developed prototype garments for the stage production's characters. The project concluded with a public performance at a Jakarta

venue (Gedung Kesenian Jakarta/Jakarta Art Building) on November 1st 2025, at which the completed costumes were worn by Teater Abnon's cast.

This structural division of roles, with CB students as researchers and FD students as makers, provided the comparative basis for examining how different forms of engagement with the same historical material produce different qualities of historical understanding.

3.3 Participants

This study involved two groups of student participants and one industry representative from Teater Abnon. The student participants comprised seven students selected from those who had worked on costumes for the historical timeline of Gelora Muda: three from the CB programme (CB1, CB2, CB3) and four from the FD programme (FD1, FD2, FD3, FD4). Participants were selected through purposive sampling, as they had direct involvement in the project and were therefore best positioned to reflect on the learning process under investigation. All participants took part in separate retrospective focus group discussions with photo elicitation conducted in June 2026, approximately eight months after the project concluded.

An online interview with a representative from Teater Abnon, furthermore, plays the role of a triangulation factor and provides an external perspective on the collaboration. It should be noted that the representative's interaction with students was primarily mediated through the supervising lecturer rather than direct engagement, and that the interview was conducted several months after the project's conclusion. These factors are also acknowledged as limitations of the triangulation data.

3.4 Data Collection

Data were collected through three instruments, each designed to capture a different dimension of the learning experience.

Visual Documentation. Visual documentation was gathered throughout the project as a record of the making process at each stage of Kolb's cycle. Materials included the CB students' research deck, costume sketches, fitting photographs, and final costume images from the performance. These materials served two functions: as contextual evidence of the project process and as visual cues within the FGD sessions described below.

Focus Group Discussions with Photo Elicitation. The primary data source was two retrospective group discussions (FGD), conducted separately with CB and FD students in June 2026. For the FD students, the FGD lasted for almost 120 minutes, while for the CB students, it ended in approximately 60 minutes. This difference in length, however, is not part of the FGD structure, but a consequence of the different depth of the cycle that each group of students goes through (further discussed in section 3.6). The FGDs were structured around Kolb's four-stage Experiential Learning Cycle, with each phase of the discussion anchored by visual cues drawn from the visual documentation described above, presented sequentially to activate episodic memory and guide reflection. This approach draws on photo elicitation methodology, in which images serve as prompts to trigger narrative and reflective responses from participants [28].



Fig. 1. FGD with Photo Elicitation conducted with participants. (Saffira, et al., 2025)

Each session concluded with a written closing activity in which participants individually completed two sentence stems: 1) 'Before this project, I thought the pre-independence era was...' and 2) 'After this project, I understand it as...'; as well as writing one word that describes the era in the participants' minds. These written responses were collected as supplementary data alongside the audio-recorded discussion.

Semi-structured Interview. A semi-structured interview was conducted online with a representative of Teater Abnon to triangulate the student accounts. The interview covered four areas: the nature of the collaboration, costume's historical accuracy, students' engagement with historical references, and reflections on the process for future improvement. As noted in section 3.3, the limitations of this data source, including the representative's limited direct contact with students and the time elapsed since the project, are acknowledged.

3.5 Data Analysis

Data were analysed following the six-stage hybrid thematic analysis process outlined by Fereday & Muir-Cochrane, (2006): 1) developing the code manual, 2) testing the reliability of codes, 3) summarising data and identifying initial themes, 4) applying the template of codes and additional coding, 5) connecting the codes and identifying themes, and 6) corroborating and legitimating coded themes.

The code manual was developed a priori based on Kolb's ELC, in which each of the four stages: Concrete Experience (CE), Reflective Observation (RO), Abstract Conceptualisation (AC), and Active Experimentation (AE); was defined as a deductive code category with explicit indicators for application. This code manual served as the deductive template for organising initial codes across both FGD transcripts.

Reliability was addressed through co-author review. The code manual was reviewed and approved by co-authors before it was applied to the transcripts, and the completed coded output was similarly reviewed afterwards. This reflects a form of peer debriefing [29], distinct from a formal inter-coder check, in which an independent coder codes the data separately, and statistical agreement is calculated. This formal check was not conducted.

Table 1. Mapping of CB and FD activities across Kolb's Experiential Learning Cycle. (Saffira, et al., 2026)

Kolb's ELC Stage	CB (Creative Business)	FD (Fashion Design)
CE	Conducted full historical research: received brief from Teater Abnon, researched via digital sources (Google search, Pinterest, journals, WGSN), compiled moodboard, and produced a research deck (PDF) within one week.	Received CB's research deck through lecturers' direction and began designing, interpreted visual references, developed initial sketches per character.
RO	Reflected on research findings: noticed gaps (e.g. period sandals absent from Pinterest), assessed what was surprising or not, and evaluated FD's final costume design outputs. CB's RO occurred once, after research was complete.	Recurring reflection throughout making: when designs were revised for historical accuracy, movement necessities, and Teater Abnon's preferences; when fitting revealed performability issues; when gaps forced re-research; and when new information arrived from Teater Abnon.
AC	Built a visual mental model of the era: described its visual identity, connected clothing to social class, assessed FD's costumes against research. CB's AC is visual and aesthetic, limited to describing appearance.	Built understanding through construction decisions: grasped historical silhouettes and details through making, connected material to character's social context, navigated tension between historical accuracy and creative expression.
AE	Evaluated final costumes as an observer: assessed whether their research was represented, identified matches and gaps, completed written closing activity.	Evaluated costumes on stage as maker-evaluators: assessed whether historical understanding was realised in performance, identified specific improvements, connected costumes to character and narrative, completed written closing activity.

While CB's AE is limited in scope compared to FD's, precisely because they had no making process through which to test their understanding, their evaluation of the final costumes against their research criteria constitutes a form of experimentation within the observer role.

Following transcription and familiarisation with the data, the template was applied to the FGD transcripts through systematic coding, in which units of text were assigned to the relevant Kolb stage based on the indicators defined in the code manual. Based on the code manual, the activities done by CB and FD students were then mapped as shown in Table 1. Where data revealed patterns that the Kolb framework could not accommodate, that is, knowledge or insights that emerged from outside the project cycle itself, additional inductive codes were developed at the point of encounter. Coded data were then clustered into first-order themes, which were subsequently reviewed, refined, and organised into three second-order themes representing overarching patterns across both student groups.

The comparative structure of the study, with CB and FD students occupying different positions within the same Kolb cycle, provided the basis for cross-group analysis at each stage of theme development. Data from the Teater Abnon interview were analysed separately and used to corroborate, nuance, or extend the themes identified from the FGDs, rather than as a primary source of theme generation.

3.6 Trustworthiness and Ethical Considerations

Trustworthiness was addressed through several strategies. Triangulation was achieved by drawing on multiple data sources, allowing findings to be revisited, challenged, and synthesised across different perspectives and data types. The use of photo elicitation anchored participant responses to concrete visual evidence of the project process, reducing reliance on unaided recall [28]. Transparency in the analytical process was maintained through an explicit code manual developed before analysis, providing an audit trail from raw data to coded themes. Ethically, all participants provided informed consent for audio recording and photo taking as well as data use before each session and were assured that their identities would be anonymised in the final output and publication. The Teater Abnon representative was informed that they would be identified only as a representative of the organisation.

The authors' relationship to the research context is acknowledged. One author led the PBL project and supervised, taught, and graded all participating students as part of their enrolled coursework; a second author served as the researcher who designed and conducted all the data collection and analysis; a third author managed the project reporting, administration and review; and a fourth co-supervised the project. The FGDs were conducted several months after grading had concluded, and by the author who was not responsible for grading, which limits the likelihood that responses were shaped by grade-related concerns.

The limitations of this study are also acknowledged. The Teater Abnon representative had limited direct contact with students and was interviewed several months after the project concluded, which constrains the scope of the data triangulation. The retrospective nature of the FGDs introduces the possibility of recall bias, as participants were reflecting on experiences from approximately eight months prior.

Table 2. Excerpt Counts from the Forum Group Discussions conducted with the Fashion Design and Creative Business students.
(Saffira, et al., 2026)

Kolb stage	CB excerpts	FD excerpts
CE	11	10
RO	6	12
AC	7	10
AE	8	14
Total	**32**	**46**

A further limitation concerns the FGD total duration difference (see section 3.4.2). This reflects a structural difference rather than an interview technique, where CB completed a single research-to-output loop, while FD's process spanned design, pattern-making, fitting, and revision, generating more discrete decision points. Coded excerpt counts (as shown in Table 2) support this, with the total excerpt counts as 32 (CB) and 46 (FD), a ratio of approximately 1.4, lower than the 2:1 duration ratio. Counts were comparable at the Concrete Experience stage (11 vs 10) and Abstract Conceptualisation (7 vs 10) but diverged sharply at Reflective Observation (6 vs 12) and Active Experimentation (8 vs 14), the stages corresponding to FD's fitting and

revision activities, which had no CB equivalent. This suggests FD's richer dataset reflects more making-related events experienced, not interview length alone. At the same time, the Teater Abnon representative's confirmed absence of any direct interaction with CB students is itself consistent with, and lends some corroboration to, the finding of CB's structural isolation from the cultural practitioner discussed in section 4.2.1.

These limitations are considered in the interpretation of findings throughout the following sections.

4 Results and Discussions

Analysis of the FGD transcripts and written closing activity data, conducted through the six-stage hybrid thematic analysis process (Fereday & Muir-Cochrane, 2006), yielded seven first-order themes clustered into three second-order themes. Table 3 presents the final and complete thematic structure. As the FGDs were conducted in Indonesian, all participants' quotes presented in the following subsection have been translated into English by the researcher.

Table 3. First Order Themes and Second Order Themes (Saffira, et al., 2026)

First Order Themes	Clustered Themes	Second Order Themes
Single loop vs iterative inquiry	Theme 1	**SOT 1:** The Structure of Learning Determines the Depth of Inquiry
Research confirms vs research reveals	Theme 2	
Observer vs maker position	Theme 3	
Embodied memory as external knowledge source	Theme 4	**SOT 2:** Embodied Knowledge Exists on a Spectrum (Pre-Existing vs Cycle-Generated)
Making as embodied knowledge production	Theme 5	
Defamiliarisation triggers historical contextualisation	Theme 6	**SOT 3:** Maker Lens vs Researcher Lens Produces Different Historical Understanding
Shared material knowledge gap, different resolutions	Theme 7	

4.1 SOT1: The Structure of Learning Determines the Depth of Inquiry

This second-order theme (SOT) clusters three first-order themes and addresses the central research question of whether and how the making process generates historical knowledge differently from research alone.

Single Loop vs Iterative Inquiry. CB students completed their engagement in a single loop (brief receiving, research process, deck preparing, deck handover/exit). Meanwhile, FD students experienced multiple iterative loops driven by making demands, with each stage of construction (sketching, technical drawing, pattern making, sewing, fitting, revisions) revealing gaps that required returning to research or revising designs. FD2 described researching "(researching) the 1940s specifically—each part (of the garments was researched) separately, like different types of sleeves" only after struggling with her initial design. FD3 revised her entire concept mid-process after discovering workwear conventions through additional research triggered by the script. No equivalent iteration occurred in CB.

This structural difference directly reflects what Fereday & Muir-Cochrane [27] describe as the iterative nature of hybrid thematic analysis, and more broadly, what Kolb [30] identifies as the cyclical character of experiential learning. Both CB and FD students traversed all four stages of Kolb's ELC. CB students completed one full traversal cycle, conducting historical research as Concrete Experience, reflecting on their findings and gaps as Reflective Observation, building a visual understanding of the era as Abstract Conceptualisation, and evaluating the completed costumes at the performance as Active Experimentation. FD students, however, traversed the cycle multiple times. Each stage of costume construction revealed new gaps that forced re-entry into earlier stages of research and conceptualisation. This aligns with Kolb's definition of learning as a continuous process in which "knowledge is created through the transformation of experience," which McCarthy [13] notes requires movement through the entire cycle for learning to be truly effective. The key difference is not whether the cycle was completed, but how many times it was traversed and what drove each re-entry, whereas for FD students, it was the physical demands of making itself.

Research Confirms vs Research Reveals. The written closing activity, broken down in Table 4, provides the most direct comparative evidence. CB students largely confirmed prior knowledge, as CB1 stated explicitly: "(the understanding about the historical period) stays the same, not much has changed (before and after project)". While all FD students demonstrated genuine transformation. FD3 moved from "(the pre-independence era was) very bleak—only national heroes fought, youth were not included" to "they were not as powerless as I thought. People from all walks of life fought and struggled too."

Table 4. Summary of Written Closing Activity (Saffira, et al., 2026)

	Before	After	One Word
CB1	"Everyone wanted freedom and sovereignty"	"The same, not much has changed"	"Democracy"
CB2	"Very tense"	"There are many things we can learn from it"	"Nationalism"

CB3	"Full of the struggle of youth who were eager for independence, seen from the sacrifices made"	"I understand it deeper — from a society that was always formal and serious"	"Peak-nationalism"
FD1	"Full of misery and chaos, still very under the Dutch and Japanese government"	"Full of teamwork, struggle and ambition"	"Hope"
FD2	"Not too modern in outfit — I thought it would be more traditional"	"More explorative and still connected with what exists today"	"Nationalist"
FD3	"Very bleak — only national heroes fought; youth were not included"	"It was not as bleak and powerless as I thought — they fought and struggled from all walks of life"	"*Bergelora"* (fiery/burning)
FD4	"Super bleak"	"Super bleak but there are still opportunity and spirit to fight back"	"*Semangat*" (full of spirit)

Observer vs Maker Position. CB students evaluated the final costumes from outside the making process, identifying gaps but lacking the ability to act on them. FD students generated specific, actionable self-knowledge. FD3 assessed: "(It seems like) the CB students did not deeply research the history of that era. They immediately looked for the clothes that resemble the era." This statement actually matched the fact that CB students felt that they already knew the historical context before the research began; therefore, they did the research about the garments right away. FD4 identified a fundamental embodied insight: "The enlargement we give to a mannequin is different from what a human who needs to move requires." This was further confirmed by the Teater Abnon representative, who noted that many designs required revision after presentation; evidence that iterative revision was a structural feature of FD students' process.

4.2 SOT2: Embodied Knowledge Exists on a Spectrum (Pre-Existing vs Cycle-Generated)

This second-order theme (SOT) clusters three first-order themes and addresses the central research question of whether and how the making process generates historical knowledge differently from research alone.

Embodied Memory as External Knowledge Source (CB Students). When digital research proved insufficient, CB students instinctively drew on personal and family memory. CB2 and CB1 both identified a particular style of sandals as a historical item they could not find on Pinterest, resolving the gap through lived memory: "(I learned about that kind of sandals) from my grandparents. Yes, from my personal experience." CB1 explained. He also pointed out that in the past, people could just wear one look for all of their activities in one day, unlike modern people who need different garments for different activities. "People back then were just that

simple.", he further added. Those kinds of knowledge, no matter how little or mundane, proved more vivid and lasting than anything found on digital research. This pattern (knowledge sourced from lived family memory outside the project cycle) did not fit the deductive Kolb-stage template and was developed as an inductive code during analysis, consistent with the hybrid coding approach described in section 3.5. This pre-existing embodied knowledge was real and meaningful, but the project provided no vehicle to activate, test, or deepen it.

This finding resonates with the broader argument in the literature review that knowledge begins both in the mind and the body [11, 16]. CB students possessed embodied historical knowledge which was acquired through personal and family memory outside the project cycle, but the project provided no mechanism to translate that perception into tangible outcomes under real constraints [11, 19]. Without a making process to activate it, their embodied knowledge remained experientially passive. What the project lacked for CB students was a making process, a vehicle through which pre-existing embodied knowledge could be tested, applied, and deepened against the demands of physical construction.

This structural isolation was corroborated by the Teater Abnon representative, who confirmed no direct interaction with CB students occurred at any point in the project, and that even the initial historical brief was communicated through the supervising lecturer rather than directly to students of either group. Unlike CB, however, FD students had some direct contact with the representative during design selection, fitting, and revision, though this contact centred on technical and movement requirements instead of historical content. CB's complete absence of any direct contact with the cultural practitioner, even on non-historical matters, further reinforces the finding that their engagement with the project remained externally mediated throughout.

Making as Embodied Knowledge Production (FD Students). FD students generated embodied knowledge that could only have come from physical making. As mentioned in 4.1.3., it is also reflected in the way FD4 discovered a fundamental difference between dressing a mannequin and dressing a moving human body. In addition, FD3 discovered period-specific construction details through making decisions: "I didn't know that in that era, cargo pants with patch pockets like that already existed—I only found out when I searched again." These insights were not retrievable from research alone; they emerged from the act of making itself.

FD students' experience directly supports the argument that what experiential projects add is the demand to translate perception into tangible outcomes, bridging the gap between how something appears in research and how it must perform in the world [11, 19, 20]. The specific knowledge generated through fitting, construction, and material handling could not have been retrieved from digital sources alone, confirming Macedonia's [16] argument that the body is an active site of knowledge production, not merely a vehicle for receiving information.

4.3 SOT3: Maker Lens vs Researcher Lens Produces Different Historical Understanding

This second-order theme addresses how the position a student occupies in the project, be it as a researcher or maker, shapes not only what they learn but how they read

history. CB students, as researchers, approached the historical material through a visual accuracy lens: seeking what the era looked like. FD students, as makers, were forced into a designer lens: asking why people dressed the way they did, and how garments needed to function for specific bodies in specific scenes.

Defamiliarisation Triggers Historical Contextualisation. CB students arrived with prior expectations about the era; primarily anchored in the Sumpah Pemuda narrative; and their research largely confirmed these. FD students, by contrast, began with incorrect assumptions. FD1 expected traditional dress instead of preppy garments and suits: "When I heard 'female youth of the past' (as the character name), I imagined a very traditional (looking) woman. But then looking at the research deck, it was already quite modern, and women were starting to be allowed to wear more formal clothes." This defamiliarisation forced deeper inquiry. By the end of the project, students had developed contextual understanding beyond the visual. FD2 concluded that "Indonesia was still very much under the Dutch influence—it didn't have its own style yet", while FD3 synthesised the era's dress philosophy as functional rather than aesthetic: "The clothes were about function, not aesthetics—what mattered was being formal and functional because they were struggling (for independence)."

This pattern confirms what Jablon-Roberts and Sanders [21] as well as Koppinen [22] argue about costume design education: that students must go beyond dressmaking to interpret the actions, manners, and social context of a historical period. FD students' initial misconceptions functioned as a productive entry point into this deeper contextualisation, ultimately enabling them to construct historical understanding through active inquiry rather than passive image consumption [24].

Shared Material Knowledge Gap with Different Resolutions. Both groups identified a gap between the historical material they researched and the actual fabrics used in production. CB students identified this from outside the making process; CB2 and CB1 both noted the absence of an ageing process that would have given the costumes a more authentic period texture. FD students encountered a similar gap from inside the making process and had to actively work around it. FD1 noted, "The fabric was too loose and limp—a lot of the intended look was lost because the fabric fell (draped) too much." To address this, FD students' skills allowed them to work around the problem by adjusting the design and pattern-making technique to compensate, structuring the garments to hold their intended silhouette despite the fabrics' limitations. CB students, by contrast, could only note the discrepancy without any means to intervene. The Teater Abnon representative confirmed this as a structural supply chain issue rather than a failure of student knowledge, noting that fabrics delivered did not always match what had been selected. This shared challenge, resolved differently by each group, reinforces the argument that maker position transforms passive identification of problems into active, embodied problem-solving.

That both groups identified the material gap but resolved it differently reflects McLaine and McCabe's [20] observation that collaborative costume design projects require students to manage constant contingencies and navigate the gap between how a design appears and how it must perform in the world. CB students identified the problem from outside while FD students had to actively work around it,

demonstrating that maker position transforms observation into embodied problem-solving [11, 16].

5 Conclusions

This study examined how PBL generates historical knowledge across two student groups occupying different roles within the same collaborative project. The findings suggest that the making process produced a qualitatively different and more layered form of historical understanding than research reception alone. FD students, driven by the iterative demands of costume construction, demonstrated genuine knowledge transformation by the end of the project. CB students, completing one full traversal of Kolb's cycle as researchers and observers, largely confirmed prior knowledge without generating new historical understanding. This was most directly evidenced by CB1's closing activity response that understanding of the era remained unchanged, contrasting with shifts demonstrated by all FD students.

Three overarching findings characterise this distinction: the structure of learning determined the depth of inquiry; embodied knowledge exists on a spectrum from pre-existing to cycle-generated knowledge; and the maker lens and researcher lens produced fundamentally different historical understanding, where CB students built visual descriptions of the era while FD students developed contextual understanding, such as of why people dressed the way they did.

These findings suggest that cross-program PBL can be more effective when all student groups have opportunities for direct engagement with historical material, not only through research, but through making or other forms of embodied practice. This study is limited by its single-case design and retrospective data collection. Future research might examine whether similar patterns emerge in other cross-disciplinary PBL contexts, or explore how embodied historical knowledge construction can be more intentionally designed into the curriculum.

Acknowledgments. The authors would like to express their gratitude to Yayasan Teater Abang None Jakarta (Teater Abnon) for the collaborative opportunity and for generously sharing their time and perspectives throughout this research. The authors also thank Politeknik Kreatif Indonesia (ESMOD Jakarta) for the institutional support that made this project possible.

Disclosure of Interests. The authors have no competing interests to declare that are relevant to the content of this article.

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