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Exploring Student Learning Experiences through the Implementation of the Project-Based Learning Model at SMK Syntax Bisnis School Kuningan

Saona[1], Dena Agustina[2], M. Abdurohman[3], Ahmad Rifai[4], Putri Damayanti[5]
[1,2,5]Universitas Islam Negeri Siber Syeh Nuerjati Cirebon, Indonesia
[3]Universitas Islam Nusantara, Bandung Indonesia
[4]Institusi Pesantren Babakan Cirebon, Indonesia
Email: saona0206@gmail.com, denaagustina@mail.uinssc.ac.id, aqrefgkabazi@gmail.com, Ahmadrifai@ipeba.ac.id, putrikhudori@gmail.com

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ABSTRACT
21st-century education demands a transformation from teacher-centered to student-centered learning that emphasizes the development of critical thinking, collaboration, and problem-solving skills. Project-Based Learning (PjBL) has emerged as an innovative approach that addresses these challenges, but an in-depth understanding of students' subjective experiences in PjBL remains limited. This study aims to explore and deeply understand students' learning experiences in implementing the Project-Based Learning Model at SMK Syntax Bisnis School Kuningan. The study used a qualitative approach with a phenomenological design, involving 14 student participants selected through purposive sampling. Data were collected through in-depth interviews, participant observation, and document analysis, then analyzed using the Colaizzi phenomenological analysis method. The results identified six main themes: the dynamics of experience at each stage of the project; facilitative factors (teacher support, authentic design, positive group dynamics); challenges faced (time management, interpersonal conflict, skill limitations); shifting perspectives on challenges; development of multidimensional competencies; and the fundamental transformation from passive to active learners. The study concluded that PjBL provides a transformative experience that develops a sense of ownership, resilience, and 21st-century competencies, with practical implications for teacher training, project design, skills scaffolding, and systemic support.

INTRODUCTION

21st-century education demands a transformation of the learning paradigm from teacher-centered to student-centered, emphasizing the development of critical thinking, collaboration, and problem-solving skills (Salsabila, 2024; Simatupang, 2019; Yulianto, 2023). The Project-Based Learning (PjBL) model has emerged as an innovative approach capable of addressing these challenges by engaging students in meaningful, authentic projects. Implementing PjBL not only improves academic content mastery but also develops essential social competencies and life skills for students.

Project-Based Learning is a constructivist learning model that positions students as active subjects in constructing their knowledge through in-depth investigations of complex questions

or problems (Mones & Irawati, 2023). Unlike traditional learning, PjBL provides students with the opportunity to explore, analyze, and create solutions to real-world problems within a specific timeframe (Nababan et al., 2023). Research shows that PjBL is effective in increasing intrinsic motivation, student engagement, and higher-order thinking skills (Hamidah & Citra, 2021).

In the context of Indonesian education, the implementation of the Independent Curriculum opens wider space for the application of innovative learning models such as PjBL, which encourages project-based learning and differentiation (Dewi, 2022). However, the transition from conventional methods to PjBL faces various challenges, including teacher readiness, resource availability, and student understanding of the new learning model (Zafrullah et al., 2024). SMK Syntax Bisnis School Kuningan, as one of the educational institutions implementing PjBL in its learning process, provides a rich context for exploring students' learning experiences in depth (Nadur, 2017).

Although extensive research has been conducted on the effectiveness of Project-Based Learning (PjBL), an in-depth understanding of students' subjective experiences in project-based learning remains limited, particularly in the context of Indonesian schools (Nadila & Lestari, 2025). Problems arise when the implementation of Project-Based Learning (PjBL) does not always result in a positive learning experience for all students, with some experiencing difficulties in managing projects, collaborating with peers, or understanding learning objectives (Nadila & Lestari, 2025). Furthermore, factors influencing the quality of students' learning experiences in Project-Based Learning (PjBL), such as project design, teacher support, and group dynamics, have not been comprehensively explored in qualitative research in Indonesia (Cantika et al., 2025).

The urgency of this research lies in the need to understand students' perspectives as the primary subjects in learning, given that the success of PjBL implementation is highly dependent on how students experience, interpret, and respond to the learning process (Boroallo & Purnamasari, 2025). A deep understanding of student experiences can provide valuable insights for teachers and policymakers in designing PjBL implementations that are more effective and responsive to student needs. Furthermore, this research is important in the context of evaluating the implementation of the Independent Curriculum, which emphasizes student-centered learning and holistic competency development.

Numerous studies have explored the implementation of PjBL in various educational contexts with varying focuses. Research (Krajcik & Shin, 2023) shows that PjBL significantly improves students' academic achievement in science and mathematics. Meanwhile, Larmer et al. (2015) found that PjBL is effective in developing students' critical thinking, creativity, and collaboration skills. Another study (Bulkini & Nurachadijat, 2023) revealed that PjBL increases students' intrinsic motivation and engagement in learning.

Although quantitative research on the effectiveness of Project-Based Learning (PjBL) has been extensively conducted, qualitative research exploring students' subjective experiences remains limited, particularly in the Indonesian context. While some studies have explored teachers' perspectives on PjBL implementation, students' voices, as key actors in learning, remain underrepresented in the literature. Furthermore, research specifically exploring the dynamics of students' learning experiences throughout the project cycle—from planning to reflection—is limited (Rohmani et al., 2025).

This research offers novelty in several aspects. First, it adopts a phenomenological approach to explore students' lived experiences in project-based learning, providing a deep understanding of the subjective meanings students construct (Amanda et al., 2024). Second, it explores not only the final learning outcomes but also the dynamic processes students experience at each stage of the project, including challenges, adaptation strategies, and transformative moments (Estari, 2020). Third, the research context at SMK Syntax Bisnis School Kuningan, which has systematically implemented Project-Based Learning (PjBL), provides a rich natural setting for understanding Project-Based Learning (PjBL) implementation within the context of Indonesian culture and education systems (Laksono, 2013).

This study aims to explore and understand in depth the students' learning experiences in implementing the Project-Based Learning model at SMK Syntax Bisnis School Kuningan. Specifically, it aims to: (1) describe students' subjective experiences in each stage of project-based learning; (2) identify factors that facilitate and hinder students' positive learning experiences in PjBL; (3) understand how students interpret and respond to challenges in the project-based learning process; and (4) reveal the dimensions of learning experiences that contribute to the development of students' academic and non-academic competencies.

This research is expected to provide theoretical contributions to enrich the literature on project-based learning, particularly from the perspective of the phenomenology of student experience. Practically, the findings of this study can offer input for teachers in designing and implementing Project-Based Learning (PjBL) that is more responsive to students' needs and experiences. For school leaders, this research can provide insights for developing policies and programs to improve the quality of learning. More broadly, it is expected to offer implications for educational policymakers in optimizing the implementation of project-based learning as part of national education reforms toward student-centered learning and the development of 21st-century competencies.

METHOD

This study used a qualitative approach with a phenomenological design to explore students' lived experiences in implementing the *Project-Based Learning* model at SMK Syntax Bisnis School Kuningan. The phenomenological approach was selected to capture the essence of participants' subjective experiences and the meanings they attributed to the phenomena (Morrow et al., 2015). The focus was on students' learning experiences in PjBL, encompassing cognitive, affective, and social dimensions during the project-based learning process.

Participants were purposively sampled using these criteria: (1) students who had participated in PjBL for at least one semester; (2) good communication skills; (3) willingness to participate voluntarily; and (4) representation of diverse learning experiences. The sample size was determined by data saturation, resulting in 14 students (Creswell & Creswell, 2018). Primary data were collected through in-depth interviews and participant observations, supplemented by secondary data from learning documents such as project designs, student reflection journals, and project portfolios.

Data collection involved three complementary techniques. First, semi-structured interviews were conducted individually for 45–60 minutes using a guide based on the PjBL framework. Questions addressed students' experiences at each project stage, challenges,

adaptation strategies, peer and teacher interactions, and reflections. Second, participant observation took place during classroom project activities, focusing on student interactions, engagement, and responses to challenges. Instruments included the interview guide, observation protocols, an audio recorder, field notes, and a camera for visual documentation. Third, document analysis of student journals, portfolios, and other materials supported data triangulation. Interviews were audio-recorded with consent and transcribed verbatim, while observational data were documented through structured field notes.

Data analysis followed Colaizzi's phenomenological method in seven stages: (1) reading transcripts thoroughly, (2) extracting significant statements, (3) formulating meanings, (4) clustering themes, (5) integrating themes into descriptions, (6) defining the essence of the experience, and (7) validating findings with participants (Morrow et al., 2015). NVivo 12 software assisted in organizing and coding data.

Trustworthiness was ensured via credibility (triangulation and member checking), transferability (thick description), dependability (audit trail), and confirmability (reflexive journaling) (Niam et al., 2024). Ethical protocols included obtaining written informed consent from participants and guardians, maintaining confidentiality and anonymity using pseudonyms, allowing withdrawal without consequence, and securely storing data. The study received ethical clearance from the institutional ethics committee and permission from SMK Syntax Bisnis School Kuningan.

RESULTS AND DISCUSSION

This study involved 14 student participants who had experienced project-based learning at SMK Syntax Bisnis Schoole Kuningan. Data were collected through in-depth interviews, participant observation for 3 months, and analysis of learning documents. Through Colaizzi's phenomenological analysis, the researcher identified 89 significant statements which were then organized into 23 sub-themes and 6 main themes that represent the essence of students' learning experiences in PjBL. The following are the research findings presented based on the emerging themes.

Student Experience in Project-Based Learning Stages

Interview results indicated that the initial phase of project-based learning provided a diverse experience for students. Most participants (11 out of 14 students) expressed a high level of enthusiasm and curiosity when first introduced to the project concept. They described this moment as "exciting because it's different from regular learning" and "intriguing about what we'll be working on." However, this enthusiasm was also accompanied by feelings of anxiety and confusion, particularly related to the complexity of the tasks and the lack of clarity regarding the steps to be taken.

During the planning phase, students experienced complex dynamics in interacting with group members. The most challenging experience participants expressed was negotiating roles and responsibilities within the group. Some students reported experiencing conflict over who would work on which parts, while others struggled to voice their opinions in group discussions. Participants with more extroverted personalities tended to have an easier time in this phase, while introverted students took longer to find their roles within the group.

The project implementation phase was identified as the longest and most intense stage in the students' experience. Participants described this phase as a period of "emotional ups and downs" during which they faced various technical and interpersonal challenges. A prominent positive experience was a sense of autonomy and ownership over their project. Students felt "more responsible" and "more free to be creative" compared to conventional learning. They also expressed satisfaction when they successfully found solutions to the problems they investigated.

The experience of presenting project results evoked strong emotional responses from participants. Nearly all students expressed nervousness and anxiety before the presentation, but afterward they reported significant feelings of pride and accomplishment. Several participants described the presentation moment as a "thrilling yet satisfying high point." They appreciated the opportunity to showcase their hard work and receive recognition from their classmates and teachers. The feedback they received during the presentation was also a valuable learning experience.

The reflection phase provides an opportunity for students to internalize their learning. Participants expressed that the reflection process helped them "realize what they've learned" and "understand mistakes they've made." However, some students felt this phase received insufficient attention due to time constraints. Those who engaged in in-depth reflection reported a greater understanding of their own learning process and areas for improvement. Reflection journals served as a tool that helped students express their thoughts and feelings about their learning experiences.

Table 1. Distribution of Student Experience in Each Stage of PjBL

PjBL Stages	Dominant Positive Experience	Dominant Negative Experiences	Number of Students	Percentage
Initiation & Orientation	Enthusiasm, Curiosity	Confusion, Anxiety	11	78.6%
Planning & Task Distribution	Early Collaboration	Role Conflict, Communication Difficulties	8	57.1%
Implementation & Investigation	Autonomy, Creativity	Frustration, Technical Difficulties	14	100%
Presentation	Pride, Achievement	Presentation Anxiety	13	92.9%
Reflection & Evaluation	Self-Awareness, Deep Learning	Time Limitation	9	64.3%

Source: Processed Data, 2024

Factors That Facilitate Positive Learning Experiences

The teacher's role as a facilitator emerged as the most significant factor facilitating students' positive learning experiences in PjBL. Participants expressed that teachers who provided clear guidance at the beginning of the project, while still allowing space for independent exploration, created the ideal balance. Students appreciated teachers who were "always there to help when we got stuck" but didn't "give us immediate answers." The most valued forms of support included regular check-ins to monitor progress, providing constructive feedback, and helping students resolve conflicts within the group.

The relevance and authenticity of projects to the real world are important factors that motivate students to engage deeply. Participants reported that projects that "connect with everyday life" or "solve real-world problems" made them more enthusiastic and felt their learning was meaningful. Students revealed that when they saw practical applications of what they learned, their intrinsic motivation increased significantly. Projects that had a challenging but not overwhelming driving question also helped students stay focused and engaged throughout the process.

Group composition and the quality of interactions among group members play a crucial role in shaping students' learning experiences. Groups that successfully foster open communication, mutual respect, and equitable division of labor tend to report more positive experiences. Participants identified characteristics of effective groups, including trust among members, the ability to resolve conflict constructively, and emotional support during difficult times. Several students expressed that having "supportive group mates" made a significant difference in their experiences.

Access to learning resources and sufficient time allocation were consistently cited as facilitative factors by participants. Students valued the availability of materials, technology, and workspaces that supported their project implementation. They also expressed the importance of having sufficient time for exploration, trial and error, and iteration in developing project products. Participants who felt "rushed" or "short on time" tended to report higher levels of stress and lower satisfaction with the final outcome of their projects.

The clarity of assessment criteria and the transparent evaluation process provided a sense of security and direction for students. Participants reported that the assessment rubric explained at the beginning of the project helped them understand expectations and better plan their work. Students also appreciated the combination of process and product assessment, as well as the self- and peer-assessment components, which helped them develop their self-evaluation skills. The formative feedback provided throughout the process also helped students continuously improve the quality of their work.

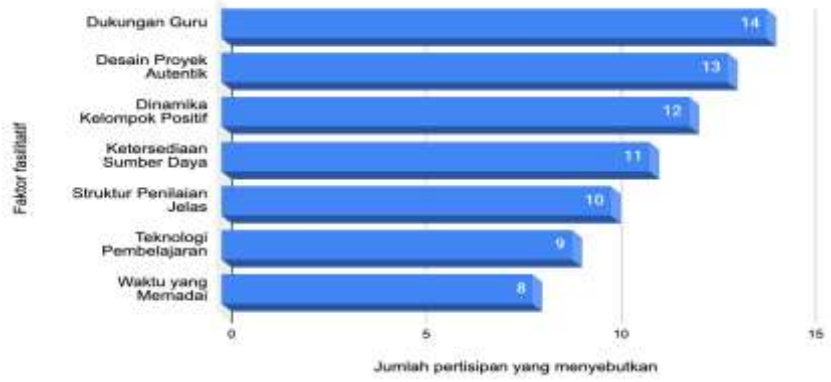

Figure 1. Facilitative Factors of Positive Learning Experiences in PjBL
Source: Processed Data, 2024

Challenges and Obstacles Faced by Students

One of the biggest challenges expressed by nearly all participants was the difficulty in managing time and organizing multiple aspects of the project simultaneously. Students reported feeling overwhelmed by the sheer number of tasks and struggling to prioritize which tasks to

tackle first. Several participants admitted to frequently procrastinating at the beginning of a project and then feeling stressed as the deadline approached. This challenge was particularly felt by students who were not accustomed to learning that required high levels of self-regulation.

Although collaboration is a primary goal of PjBL, interpersonal conflict within groups presents a significant obstacle for many students. Participants described various forms of conflict, ranging from disagreements about the project's direction, to unfair division of labor, to free-riders who do not contribute proportionally. Some students expressed frustration with group members who were "not serious" or "unwilling to cooperate." This conflict not only impacted project progress but also created emotional tension that disrupted the learning process.

Participants reported encountering moments where they felt their knowledge or skills were insufficient to complete certain aspects of the project. These challenges arose especially when the project required the use of new technology, unfamiliar research methods, or the application of complex concepts. Students described feelings of frustration and self-doubt when they "didn't know where to start" or "didn't understand how to use the necessary tools." Some participants expressed a need for more scaffolding in certain technical areas.

Project-based learning demands a higher cognitive level than traditional learning, which can be quite overwhelming for some students. Participants reported having to "think harder" and "process a lot of information at once" in Project-Based Learning (PjBL). Coupled with other academic responsibilities, some students reported experiencing stress and mental fatigue. They described experiencing "mental exhaustion," particularly in the weeks leading up to presentations when they had to complete multiple project components simultaneously.

In contrast to traditional, more structured and predictable learning, PjBL presents a level of ambiguity that makes some students uncomfortable. Participants expressed that the lack of "definite answers" or "clear steps" at the beginning of a project made them anxious. Some students accustomed to directive learning struggled to adapt to the openness and flexibility offered by PjBL. They expressed a need for "more direction" or "concrete examples" to reduce their perceived uncertainty.

Table 2. Categories of Challenges and Coping Strategies Used by Students

Challenge Categories	Number of Students	Effective Coping Strategies	Less Effective Coping Strategies
Time & Project Management	13	Create timelines, task breakdowns, regular check-ins	Delaying work, relying on others
Group Conflict	10	Open communication, teacher mediation, making group rules	Avoid conflict, work alone
Technical Skills Limitations	12	Looking for tutorials, asking experts, trial and error	Give up, change project design
Academic Pressure	9	Time management, self-care, peer support	Overworking, neglecting health
Process Ambiguity	8	Ask the teacher, group discussion, step by step	Waiting for complete instructions, copying other groups

Source: Processed Data, 2024

Student Meaning and Response to Learning Challenges

Data analysis showed that most participants experienced a shift in their perspective on challenges as the project progressed. Initially, students tended to view difficulties as distracting and frustrating obstacles. However, with the support of reflection and guidance from their teachers, they began to view challenges as an integral part of the learning process. Participants expressed that they learned to "see problems as opportunities to learn something new" and that "difficulties make us more creative in finding solutions." This shift in mindset was stronger among students who had experienced multiple project cycles.

The experience of facing and overcoming challenges in PjBL contributed to the development of student resilience. Participants reported that they became "more resilient to failure" and "less likely to give up when faced with difficulties." They described the trial and error process within the project as a valuable lesson in perseverance and adaptability. Several students explicitly identified a change in how they responded to failure, from "immediately getting frustrated and giving up" to "trying another approach" or "seeking help." These experiences helped students develop a growth mindset that views abilities as something that can be developed through effort.

When faced with challenges, students developed a variety of creative and contextualized adaptation strategies. Participants described an iterative process in discovering strategies that worked for them. The most frequently mentioned strategies included: breaking large tasks into manageable chunks, seeking help from various sources (teachers, peers, the internet), brainstorming with groups to find alternative solutions, and making adjustments to initial plans when faced with obstacles. Students also learned to use feedback as input for improvement. Several participants revealed that they developed their own "systems" to address the specific challenges they faced.

Support from friends, teachers, and family emerged as a crucial factor in helping students interpret and respond to challenges more constructively. Participants expressed that sharing difficulties with classmates or group members helped them realize that "I'm not the only one experiencing this." This sense of shared struggle reduced feelings of isolation and increased motivation to continue trying. Empathetic and approachable teachers also helped students avoid feeling overwhelmed by challenges. Several students also mentioned the role of family in providing emotional support and encouragement when they felt down.

The reflection process facilitated in PjBL helps students not only overcome challenges but also learn about their own learning processes. Participants reported that reflective journals and reflective discussion sessions helped them identify "what worked and what didn't work" in their approaches. They became more aware of their own strengths and weaknesses, their most effective learning styles, and the conditions that support their optimal performance. This metacognitive awareness helps students become more self-regulated and strategic learners in future projects.

Dimensions of Experience That Contribute to Competence Development

Students' experiences in PjBL significantly contributed to the development of higher-order cognitive competencies. Participants reported improvements in critical thinking skills through the process of analyzing problems, evaluating multiple sources of information, and synthesizing complex solutions. They expressed that PjBL forced them to "think more deeply"

and "not just memorize" as in conventional learning. Problem-solving skills developed through the experience of facing real-life challenges and finding creative solutions. Students also reported improved conceptual understanding because they had to apply theoretical knowledge in practical contexts, making learning more meaningful and memorable.

The collaborative dimension of PjBL contributes substantially to the development of students' social skills. Participants identified improvements in their communication skills, both verbal and written, as they had to continuously interact with group members, the teacher, and the audience during presentations. They learned to "listen better to others' opinions" and "communicate ideas more clearly." Negotiation and conflict resolution skills developed through experiences managing disagreements and resolving tensions within groups. Students also reported increased empathy and the ability to work with people from different backgrounds and different ways of working.

The PjBL learning experience significantly developed students' self-management and self-regulation skills. Participants reported that they learned to "take more responsibility for their own work" and "not always rely on the teacher's instructions." Time management skills developed through the need to plan and manage various project stages within a specific timeframe. Students learned to set priorities, create timelines, and monitor their own progress. Self-motivation skills also improved due to the nature of the project, which required high levels of initiative and persistence. Several participants expressed that they became "more independent" and "more confident in making decisions."

Project-Based Learning (PjBL) provides ample space for students to explore their creativity and innovation. Participants reported that the freedom to design solutions and final project products allowed them to "think outside the box" and "try new ideas that had never been done before." They appreciated the opportunity to experiment and take risks without fear of the consequences of poor grades. The iterative design and prototyping process helped students develop an innovative mindset that was unafraid of failure. Several students expressed that Project-Based Learning (PjBL) enabled them to "discover creative potential that we hadn't realized before."

The use of technology in PjBL contributes to the development of students' digital literacy. Participants reported improved skills in using various digital tools for research, collaboration, creation, and presentation. They learned to use search engines effectively, evaluate the credibility of online sources, use software to create data visualizations, and utilize collaborative platforms for group work. Students also developed the ability to select the most appropriate technology for their specific project needs. Several participants expressed learning "useful new technology" and feeling "better prepared for the digital world."

Table 3. Dimensions of Competencies Developed through PjBL (Student Self-Assessment)

Competency Dimensions	Average Improvement (Scale 1-5)	Specific Aspects that are Developing	Number of Students Reporting Increase
Cognitive	4.3	Critical thinking, problem-solving, deep conceptual understanding	14 (100%)
Social-Collaborative	4.1	Communication, teamwork, conflict resolution, empathy	13 (92.9%)

Self-Management	3.9	Time management, responsibility, self-motivation, independence	12 (85.7%)
Creativity	4.5	Creative thinking, innovation, risk-taking, design thinking	13 (92.9%)
Digital Literacy	4.2	Use of technology, information evaluation, collaboration tools	14 (100%)
Metacognitive	3.7	Self-awareness, reflection, learning strategies	11 (78.6%)

Note: Scale 1 (No Improvement) to 5 (Very Significant Improvement)

Source: Processed Data, 2024

The Essence of Student Learning Experience in Project-Based Learning

A synthesis of all the data suggests that the fundamental essence of students' experiences in PjBL is the transformation of their roles from passive recipients of information to active agents in the construction of their own knowledge. Participants consistently described this shift as the most significant and transformative aspect of their experience. They felt a strong sense of ownership and agency over their learning, which differed fundamentally from their experiences in traditional learning. This transformation did not occur instantly but rather through a gradual process involving trial and error, reflection, and appropriate support.

The second essence that emerged was a deep understanding that learning is an inherently social and collaborative process. Participants revealed that interacting with peers, teachers, and even people outside of school within the context of projects made learning more meaningful and engaging. They learned not only from books or teachers, but also from the diverse perspectives and experiences of others. This social dimension also moved learning beyond the purely academic realm to an experience involving emotions, values, and interpersonal relationships. Students realized that they were learning not only about the subject matter but also about themselves and others.

Although initially anxiety-inducing, the uncertainty and ambiguity inherent in PjBL emerged as elements that paradoxically fostered growth and profound learning. Participants described how the absence of predetermined answers forced them to think independently, take risks, and develop confidence in their own judgment. Uncertainty created space for experimentation, creativity, and discovery that would not have been possible in overly structured learning. Students who were initially resistant to ambiguity reported that they gradually became more comfortable with uncertainty and even valued it as part of the authentic learning experience.

The fourth essence is recognizing that failure and difficulty are not obstacles to learning but essential components of a meaningful learning process. Participants revealed that moments of struggle and mistakes are precisely when the most significant learning occurs. They learned to embrace failure as feedback and an opportunity for improvement rather than as an indication of inadequacy. This experience fundamentally changed their relationship with error and difficulty, making them more willing to take risks and engage with challenging tasks. This shift in perspective is a valuable life skill beyond the academic context.

The final, most profound essence is the students' experience of dissolving the boundary between "school" and "real life." Participants reported that PjBL made them see the relevance of what they learned in school to the world outside the classroom. They no longer viewed learning as something isolated and artificial, but as a process connected to real-world issues and

their future aspirations. This experience made learning more purposeful and meaningful. Students expressed that they could see "why we are learning this" and "how it will be useful later," which significantly increased their motivation and engagement in learning.

Table 4. Essential Themes Statements from Phenomenological Analysis

Essential Theme	Essential Statement	Frequency of Appearance	Representation of Meaning
Agency & Ownership	"I feel like this is my project, not just an assignment from the teacher"	14/14	Sense of control and responsibility for learning
Social Construction	"Studying with friends makes me understand more deeply"	13/14	Learning as a collaborative social process
Productive Struggle	"Difficulties make me learn not to give up easily"	12/14	Growth through facing challenges
Authentic Relevance	"I can see why this is important for real life"	13/14	Connections between learning and the real world
Transformative Discovery	"I discovered abilities I didn't know I had"	11/14	Self-discovery and development of self-potential

Source: Processed Data, 2024

The results of this study indicate that students' learning experiences in PjBL are multidimensional, dynamic, and deeply personal. The essence of their experiences involves a fundamental transformation in how they view themselves as learners, understand the learning process, and interpret the relationship between formal education and their lives.

Discussion

Dynamics of Transformative Experience in PjBL

Research findings reveal that students' experiences in Project-Based Learning are transformative journeys that simultaneously involve cognitive, affective, and social dimensions. The "emotional roller coaster" pattern experienced by students—from initial enthusiasm mixed with anxiety, through periods of frustration, to satisfaction and pride—reflects the intensity of authentic learning that challenges and encourages growth. Unlike traditional learning, which tends to produce flat emotional experiences, Project-Based Learning (PjBL) creates richer and more meaningful experiences, albeit more demanding. Each phase in the project cycle presents unique challenges and learning experiences: initiation arouses curiosity but also uncertainty, planning exposes the complexities of collaboration, implementation becomes an arena for substantive learning through investigation and iteration, presentations develop communication skills and confidence, while reflection consolidates experiences into internalized learning.

A strong sense of ownership and agency is a game-changer for student motivation. When students feel like a project is "theirs," not just an assignment, their level of investment increases dramatically. Autonomy fulfills a basic psychological need that enhances intrinsic motivation, but it also brings responsibility that requires self-regulation skills. This tension between freedom and structure is a central challenge in PjBL—too much structure erodes ownership, while too little overwhelms students. The optimal balance depends on the students' developmental readiness and the quality of scaffolding provided by the teacher.

Facilitative and Barrier Factors: Two Sides of the Same Coin

Teacher support emerged as the most crucial factor, essentially providing scaffolding that helps students navigate the inherent challenges of PjBL. Skilled teachers are able to read students' needs and dynamically adjust support—providing guidance when stuck, stepping back when students are capable of progressing independently. Authentic project design forms the foundation of engagement, but authenticity must be balanced with complexity and appropriate resources. The sweet spot is in the zone of proximal development, where the challenge is high enough to stimulate growth but achievable with effort and support. Positive versus conflicting group dynamics illustrate the tension in collaborative learning—collaboration does not automatically produce positive outcomes, but when facilitated well, it becomes a powerful context for developing social skills and shared knowledge construction.

Resource availability and time allocation are often underestimated enabling conditions. Insufficient resources force compromise, while excessive time pressure turns PjBL from a deep learning experience into a stressful race. Transparent assessment structures provide a roadmap that reduces anxiety from ambiguous tasks. Clear rubrics, formative feedback, and multidimensional assessment that captures both process and product acknowledge the complexity of learning in PjBL and convey the message that various aspects of learning are valued.

Transforming Perspectives on Challenges

The shift in students' perspective from viewing challenges as obstacles to learning opportunities represents a fundamental shift in mindset. This transformation is facilitated through reflective practices, growth mindset messaging, and a supportive environment that normalizes struggle. Developing resilience through repeated experiences overcoming obstacles is one of the most valuable long-term outcomes. Every successful navigation of difficulty builds confidence and self-efficacy, which serve as psychological reservoirs for future challenges.

The adaptive coping strategies developed demonstrate sophisticated executive functioning—from breaking down tasks, seeking multiple help sources, brainstorming alternatives, to adjusting plans. The role of social support in buffering stress is crucial: shared struggle normalizes challenges, peer support provides practical help and emotional validation, teacher empathy makes help-seeking less threatening, and family support reinforces effort. Reflective practices facilitate metacognitive development, enabling students to become more strategic and self-directed learners who can transfer learning strategies across contexts.

Multi-dimensional Competency Development

PjBL develops higher-order cognitive skills through a shift from surface learning to deep understanding. Critical thinking develops when students analyze complex problems, problem-solving skills are honed through ill-structured authentic problems, and conceptual understanding deepens through application in concrete contexts. Social and collaborative competencies—communication, negotiation, conflict resolution, empathy, and perspective-taking—develop through constant interaction. Self-management competencies, including time management, goal-setting, self-motivation, and responsibility, prepare students for self-directed learning. Creativity and innovation competencies are fostered through the freedom to explore

solutions and tolerance for ambiguity. Digital literacy competencies, developed through meaningful technology integration, prepare students for the digital age.

The Essence of the Phenomenon: Transforming Identity as a Learner

At a fundamental level, experiences in PjBL represent a transformation in learner identity. Students move from passive recipients to active agents, from consumers of knowledge to constructors of knowledge. Recognizing that learning is inherently social challenges individualistic conceptions and develops an appreciation for diversity as an asset. Embracing uncertainty as productive demonstrates cognitive maturity essential for addressing complex real-world problems. Reframing failure as an integral part of learning develops a growth mindset and resilience that serve students throughout life. The integration of school learning with real-world concerns dissolves artificial boundaries, making learning personally meaningful and developing a sense of agency in shaping their world.

The findings of this study are consistent with the body of literature on PjBL while deepening understanding in several important ways. (Krajcik & Shin, 2023) state that "project-based learning promotes deeper understanding by engaging students in sustained inquiry around meaningful questions and problems." This study confirms this principle and adds a nuanced understanding of how sustained inquiry is actually experienced—not a linear process but an iterative journey with ups and downs. (Larmer et al., 2015) identify that "successful PjBL requires significant shifts in teaching practice, classroom culture, and student expectations." Students in this study articulated struggles with self-regulation and collaboration, but this research goes beyond documenting how students actually cope with and overcome difficulties. (Bulkini & Nurachadijat, 2023) argue that "authenticity in PjBL is critical for sustaining student motivation and promoting deep learning." Students repeatedly emphasized the importance of relevance and real-world connections, but this study also reveals that authenticity alone—insufficient authentic problems—must be appropriately scoped and properly supported.

Based on the research findings, there are four practical implications that need to be considered in the implementation of PjBL. First, schools must invest in ongoing and comprehensive teacher training, not just one-off workshops. This includes hands-on experience as PjBL learners, coaching skills training, project design, and building a community of practice with support such as instructional mentoring, peer observation, and collaborative planning time. Second, project design requires special attention, with engaging and real-world-connected prompting questions, appropriate difficulty levels, clear alignment with learning objectives, structured guidance for various stages, and allowing for student voice and choice to foster ownership. Third, teach self-regulation and collaboration skills explicitly through mini-lessons, concrete tools, gradual assignment of responsibilities, and formative assessments to identify students who need additional support. Fourth, create a classroom culture that supports productive effort and a growth mindset through explicit communication, modeling growth mindset language, celebrating perseverance, building psychological safety, and implementing well-designed assessment practices that include clear rubrics, ongoing formative feedback, guided self- and peer assessment, multidimensional summative assessment, and specific, actionable, and timely feedback.

This study has four major limitations that need to be considered. First, the study was conducted in only one well-resourced school with experienced teachers, so the results may not

be directly applicable to other schools with different conditions, particularly those with limited facilities or teachers new to PjBL. Therefore, generalization to different contexts should be done with caution. Second, the use of purposive sampling and reliance on self-report data through interviews and journals present potential biases because students who volunteer and articulate may differ from the general student population. Furthermore, the data are susceptible to recall bias and the desire to appear good, while observations only capture observable behavior, so objective measures are needed to complement student self-reports. Third, the cross-sectional nature of the study captures only a moment in time without tracking long-term development. Furthermore, the lack of a comparison group makes it difficult to ensure that the reported benefits are truly due to PjBL and not other factors such as general teacher quality or student maturity. Therefore, longitudinal research with a control group would provide stronger evidence. Fourth, the study did not systematically analyze moderating variables such as prior academic achievement, socioeconomic status, or learning difficulties that may differentially influence students' experiences, which are important for equity implications, nor did it examine sustainability or scalability issues that are crucial for wider adoption, such as maintaining positive outcomes over time or implementing PjBL in less supportive contexts. Nevertheless, this study still provides a valuable contribution in understanding students' lived experiences in PjBL from a phenomenological perspective, particularly in the Indonesian context.

CONCLUSION

This phenomenological study revealed that Project-Based Learning (PjBL) transformed students at SMK Syntax Bisnis School Kuningan from passive learners into active knowledge creators, emphasizing six key themes: emotional dynamics across project stages, critical success factors like teacher support and authentic projects, challenges in time management and collaboration, students' reframing of obstacles as growth opportunities, development of 21st-century competencies, and strong links between academic content and real-world relevance. The findings demonstrate PjBL's role in fostering academic achievement, personal growth, resilience, and practical skills, underscoring the need for ongoing teacher training, well-designed projects, and institutional backing in Indonesian education. Although limited by context and methodology, the study contributes important phenomenological insights into Indonesian students' experiences, recommending future research expand to multiple schools with longitudinal designs to explore how PjBL impacts learning over time and across diverse settings.

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