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Implementation of Project-Based Learning (PjBL) in Islamic Religious Education to Enhance Vocational High School Students' Creativity and Academic Achievement in Indragiri Hilir Regency

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Abstract

This study examines the implementation of Project-Based Learning (PjBL) in Islamic Religious Education (Pendidikan Agama Islam/PAI) to enhance vocational high school (SMK) students' creativity and academic achievement in Indragiri Hilir Regency, Indonesia, and maps the enabling and constraining factors affecting its enactment. Employing a descriptive qualitative design, the study involved PAI teachers and students from three schools: SMK Taruna Bhakti Indonesia, SMK Al-Ikhlas, and SMK An-Nur Kuala Selat. Data were collected through classroom observations, semi-structured interviews, and document analysis, and were thematically analyzed through data reduction, data display, and conclusion drawing/verification. The findings indicate that PjBL fosters students' creativity and learning outcomes when teachers demonstrate strong commitment and pedagogical creativity in adapting projects to each school's context. Support from school leaders and the local community strengthens a collaborative and religious learning climate. Key challenges include limited instructional time, inadequate facilities, and gaps in teachers' competencies; however, these constraints can be mitigated by integrating projects into school programs and leveraging local resources. Overall, the study suggests that PjBL in PAI has the potential to improve creativity, academic achievement, and the development of students' religious and social character.

Keywords:
academic achievement; creativity; PAI; PjBL; SMK

Abstrak

Penelitian ini menganalisis implementasi Project-Based Learning (PjBL) pada pembelajaran Pendidikan Agama Islam (PAI) dalam meningkatkan kreativitas dan prestasi belajar siswa SMK di Kabupaten Indragiri Hilir, serta memetakan faktor pendukung dan penghambatnya. Penelitian menggunakan pendekatan kualitatif deskriptif dengan subjek guru dan siswa di tiga sekolah: SMK Taruna Bhakti Indonesia, SMK Al-Ikhlas, dan SMK An-Nur Kuala Selat. Data dikumpulkan melalui observasi, wawancara, dan dokumentasi, kemudian dianalisis secara tematik melalui reduksi data, penyajian, dan penarikan kesimpulan. Hasil penelitian menunjukkan bahwa PjBL mendorong kreativitas dan capaian belajar ketika guru memiliki komitmen dan kreativitas pedagogis dalam menyesuaikan proyek dengan konteks sekolah. Dukungan kepala sekolah dan lingkungan masyarakat memperkuat iklim belajar kolaboratif dan religius. Kendala utama meliputi keterbatasan waktu, fasilitas, dan kompetensi guru; namun dapat dimitigasi melalui integrasi proyek ke program sekolah dan pemanfaatan sumber daya lokal. Temuan ini menegaskan bahwa PjBL pada PAI berpotensi

meningkatkan kreativitas, prestasi belajar, serta penguatan karakter religius dan sosial siswa SMK.

Kata Kunci:
kreativitas; PAI; PjBL; prestasi belajar; SMK

Introduction

Workscape changes, driven by automation, digitalization, and the creative economy, push schools to equip learners with competencies that go beyond technical skills: critical–creative thinking, communication, and collaboration (four competencies often formulated as the "4C") have become important prerequisites for learning and working adaptively (Thornhill-Miller et al., 2023). In vocational education, this demand is felt more concretely because the employability of vocational high school (SMK) graduates is supported not only by hard skills but also by 4C skills that help them interact, solve problems, and make decisions in dynamic work environments (Elfajry et al., 2024). At the same time, SMKs still require a character foundation so that professional competence does not lose its ethical direction. It is at this point that Islamic Religious Education (PAI) holds a strategic position: it functions to strengthen religious–social character while also having the potential to be packaged in ways that are more contextual and meaningful for vocational learners, for example, through learning management that links spiritual values with 21st-century learning experiences (Makmun & Fatimah, 2024).

At the SMK level, classroom practice still often moves within teacher-centered patterns—material explanation dominates, model variation is limited, and student participation tends to be reactive—so space to test ideas, collaborate, and create is not formed consistently (Zega & Telaumbanua, 2023). In PAI, the challenges become more layered: relatively limited instructional time and the vocational rhythm (e.g., workplace practice/PKL) require teachers to design projects that remain meaningful yet are realistic to manage, while also being relevant to students' diverse areas of vocational expertise (Samsiadi & Romelah, 2022). The next issue concerns authentic assessment: teachers often face difficulties translating PAI learning outcomes (cognitive–affective–psychomotor) into operational indicators and instruments within a project, especially when administrative workload and time constraints press the evaluation process (Pratama, 2025). Therefore, the key problem that emerges is a mismatch between the learning approach in practice and the demands of future competencies, accompanied by tangible constraints on the teacher side in implementing PjBL in a complete manner (Astuti et al., 2025).

Conceptually, Project-Based Learning (PjBL) is understood as student-centered learning that organizes learning experiences through meaningful projects: students investigate real-world problems, integrate knowledge across topics, collaborate, and then produce artifacts/products that can be accounted for as evidence of learning (Zhang & Ma, 2023). Empirical evidence at the level of research synthesis is also fairly consistent: meta-analyses show that PjBL has a positive impact on learning achievement—including improvements in understanding and the quality of learning outcomes—while also strengthening higher-order thinking skills and more positive learning attitudes when project design, teacher facilitation, and classroom support

function adequately (Zhang & Ma, 2023). In the affective domain, problem-/project-/case-based learning tends to increase learning motivation compared with conventional approaches, although the magnitude of the effect is influenced by context, duration, and implementation quality (Wijnia et al., 2024). On the other hand, PjBL aligns with competency-based learning demands because project processes and products create space for more authentic performance assessment; vocational research emphasizes that authentic assessment helps bridge school knowledge with the demands of real-world practice (Villarroel et al., 2024).

In the context of value-oriented subjects such as PAI, PjBL is often viewed as effective because it moves values and morals from the realm of "discourse" to the realm of "social practice": students do not merely understand religious concepts, but enact them through collaborative projects that require responsibility, empathy, and social usefulness (Widadi et al., 2025). Recent literature also shows that PjBL in PAI has the potential to strengthen Islamic character as well as social competence—for example, through collaborative projects that foster moderate, dialogical, and participatory attitudes in the school environment (Gustina et al., 2025). However, in SMKs the need for adaptation becomes crucial: projects ideally should be relevant to students' vocational spectrum, realistic given limited instructional time, and supported by local resources and the school ecosystem. Therefore, institutional factors—school policies, managerial support, facility availability, and collaborative networks with communities/partners—often determine whether PjBL stops as a "method" or truly becomes a learning culture (Widadi et al., 2025; Rizkylillah et al., 2025).

Although research synthesis evidence indicates that PjBL tends to have positive effects on learning achievement, affective attitudes, and thinking skills (Zhang & Ma, 2023), available discussions often stop at "whether it is effective" and have not sufficiently explained "how that effectiveness works" in the classroom—for example, how teachers formulate driving questions, choose relevant project forms, manage tight time, and translate learning outcomes into authentic assessment indicators (Wijnia et al., 2024). In the PAI context, systematic literature reviews show PjBL's opportunities for character strengthening, yet at the same time they emphasize that the most frequent implementation constraints lie precisely in project-design competence, facility availability, and the need for teacher training (Widadi et al., 2025). On the other hand, studies of PjBL in PAI at SMKs still largely take the form of single-case portraits in particular schools (e.g., Samsiadi & Romelah, 2022), so the map of enabling and constraining factors at the school and community levels—especially in a district/regency context—has not been described in detail.

Building on this gap, this article offers contributions at two levels. First, at the contextual level, this study focuses on PjBL in PAI learning in vocational SMKs across three schools in Indragiri Hilir Regency—a context that is important because PAI learning must negotiate the diversity of vocational competencies, limited instructional time, and vocational rhythms. Second, at the analytical level, this article not only reads outcomes, but traces the implementation mechanism: how PAI projects are designed to be relevant and feasible, how time is managed, and how performance and authentic assessment are pursued so that learning truly connects with social practice and the real world (Villarroel et al., 2024).

Departing from the urgency, prior research findings, and research gaps described above, this article aims to describe the implementation of Project-Based

Learning (PjBL) in Islamic Religious Education (PAI) in SMKs and to explain how its application contributes to improving students' creativity and learning achievement, while also identifying factors that support and hinder its implementation in school and community contexts. By mapping enabling and constraining factors (school leadership, a collaborative–religious climate, community support, and resource availability) as well as mitigation strategies that can be replicated, this study is expected to provide implementable recommendations for PAI teachers and SMK management to link projects with school programs and local resources. To maintain analytical focus, this study is formulated into three questions: (1) how can the implementation of PjBL in PAI learning improve the creativity of SMK students in Indragiri Hilir Regency? (2) how can the implementation of PjBL in PAI learning improve the learning achievement of SMK students in Indragiri Hilir Regency? and (3) what enabling and constraining factors shape the implementation of PjBL in PAI learning to improve the creativity and learning achievement of SMK students in Indragiri Hilir Regency?

Methods

This study employs a qualitative approach using a multiple case study design to closely examine how Project-Based Learning (PjBL) is implemented in PAI instruction across different school contexts. A case study approach is appropriate because the research focuses on understanding a contemporary phenomenon within its real-life setting, where the boundaries between the phenomenon and context are not clearly evident (Yin, 2018). The use of a multiple case study design allows for cross-case analysis, enabling the researcher to identify patterns, similarities, and variations in the implementation of PjBL across different schools, rather than relying on a single case (Creswell & Poth, 2024). This design strengthens the analytical depth and enhances the transferability of findings by comparing how PjBL practices are shaped by different institutional and social conditions. At the same time, the study retains a descriptive qualitative orientation, as it aims to present a rich and faithful account of participants' experiences and classroom practices without generating a formal theory (Doyle et al., 2019).

The study was conducted in three vocational high schools in Indragiri Hilir Regency, Riau Province, namely SMK Taruna Bhakti Indonesia Kateman (Sungai Guntung), SMK Al-Ikhlas (Air Tawar), and SMK An-Nur (Kuala Selat)—all of which are located within Kateman District. The selection of these three sites allows the researcher to read the implementation of PjBL–PAI across varied school conditions and social environments while remaining within the same regional landscape. Field data collection is planned to take place from March to September, so that the researcher has sufficient time to observe the rhythm of instruction, project dynamics, and changes in students' learning behavior more holistically; if necessary, the researcher may conduct follow-up visits to clarify findings and complete school documents.

The study participants include PAI teachers and students in the three schools. Informants were selected purposively—based on the fit of their experience and involvement in PjBL practice—so that the data collected are truly relevant to the research questions (Campbell et al., 2020). At the teacher level, the criteria may include: teaching PAI in classes that implement PjBL, being involved in project design, and playing a role in assessment (cognitive–affective–psychomotor) and

learning reflection. At the student level, the criteria may include: direct involvement in project implementation, experience in group collaboration, and experience of being assessed through products/performances and portfolios. With this scheme, the unit of analysis becomes clear: (1) the practice of implementing PjBL in PAI (planning–implementation–evaluation), (2) indications of changes in creativity and learning achievement based on available classroom evidence, and (3) enabling and constraining factors at the levels of teachers, schools, and the environment.

Data were collected through three complementary techniques, namely observation, semi-structured interviews, and documentation. First, observations were conducted to record the PjBL process in the classroom directly—from determining the essential question, project planning, scheduling, monitoring, and assessing outcomes, to evaluating the experience—with the support of field notes and observation sheets that include these stages in the three schools. Second, semi-structured interviews were conducted with PAI teachers and students to explore implementation experiences (how projects are designed and facilitated), perceived impacts on creativity and learning achievement, and enabling and constraining factors in implementation (e.g., limited facilities, access to technology, and time management). Third, documentation was collected as supporting evidence, including teaching devices, assessment rubrics/indicators, project artifacts and/or student products, activity photos, and relevant school archives; in the interview data, teachers and students also explained the use of rubrics from the beginning of the project as part of authentic assessment.

Data analysis was conducted iteratively from the data collection stage, referring to the Miles, Huberman, and Saldaña framework that includes data condensation, data display, and conclusion drawing and verification (Miles et al., 2020). All data (observation notes, interview transcripts, and documents) were first organized and then coded in stages. In the initial stage, codes were developed along two axes: (1) stages of PjBL implementation (e.g., essential question, planning, monitoring, assessment, reflection), and (2) the focus of the research questions (creativity, learning achievement, and enabling/constraining factors). These codes were then condensed into categories and themes, such as "contextual project design," "time management strategies," "rubric-based authentic assessment," or "support from the principal and the community." The display stage was carried out by compiling school-by-school matrices and cross-site matrices to read patterns of similarities and differences, before conclusions were finally verified through cross-source comparison (teachers–students–documents) so that findings do not rely on only one type of data.

Data trustworthiness was maintained through operational strategies rather than merely declarative statements: (a) method and source triangulation—comparing findings from observations, interviews, and documents, and comparing teachers' and students' accounts; (b) member checking by confirming summaries of findings or key interpretive points with informants to ensure meaning alignment; (c) an audit trail in the form of a record of research decisions (data collection logs, coding, category/theme revisions, and reasons for changes); and (d) thick description so that readers understand the school context and the limits of the applicability of the findings (Korstjens & Moser, 2018). From an ethical perspective, the study was conducted after obtaining permission from the schools; participation was voluntary through informed consent, identities were protected through anonymization (e.g.,

codes Teacher-1/Student-1), and all data were stored securely with access restrictions to protect participant confidentiality.

Result and Discussion

The Brief Overview of the Research Context

This study is a field study in three vocational high schools (SMK) in Indragiri Hilir Regency, namely SMK Taruna Bhakti Indonesia (Kateman), SMK Al-Ikhlas (Kateman), and SMK An-Nur (Kuala Selat), with PAI teachers and students as the main informants; data were collected through observation, interviews, and documentation to portray the implementation of PjBL in PAI instruction along with its impacts and the surrounding context. At the practical level, the forms of PAI projects that emerged were diverse and contextual: at Taruna Bhakti, digital *da'wah* media projects with themes of media ethics/*akhlak* in digital spaces were prominent (e.g., script drafting, video production and editing), at Al-Ikhlas the projects were largely in the form of writing religious articles and Islamic wall magazines, whereas at An-Nur the projects tended to be simpler yet closely connected to community life, such as religious slogans, socio-religious activities, mosque cleanliness, mutual cooperation, and campaigns for the value of honesty in everyday practice. This diversity of projects also appeared in the interview data, for example the use of channels that are easily accessible to students (such as WhatsApp groups) for educational content on *akhlak*, mentoring, and even social service activities, which were chosen to remain relevant to local conditions and limited resources.

Implementation of PjBL in PAI across Three Vocational High Schools

Operationally, classroom observations in the three SMKs show that PAI instruction designed through a project-based approach has proceeded according to a relatively complete workflow—starting from determining the essential question, project planning, scheduling, monitoring progress, assessing outcomes, and evaluating the experience—and all of these stages were confirmed as being "carried out" at the three sites. This finding matters because PjBL is not merely a "product task," but rather a learning ecology that requires process continuity: the project is positioned as a vehicle for inquiry, collaborative work, decision-making, and reflection—in line with the idea of PjBL that emphasizes meaningful learning through authentic problems/projects (Thomas, 2000; Krajcik & Blumenfeld, 2006; Bell, 2010).

Within a student-centered framework, teachers tended to shift their role from dominant instructors to facilitators who organize spaces for autonomy while also providing pedagogical "holds." At SMK Taruna Bhakti, the teacher emphasized that students were given freedom to choose project themes (e.g., digital *da'wah* or social activities), while the teacher was "more as a facilitator" who guided them. Students' perspectives reinforced this shift: learning felt "more enjoyable" because projects could be selected according to their interests, and the teacher was understood as a mentor who monitored progress without controlling every detail. At SMK Al-Ikhlas, the autonomy policy was negotiated with the realities of facilities; the teacher provided room for student participation, but acknowledged the need for intensive guidance because access to the internet/devices was uneven and students' economic backgrounds varied. A similar pattern appeared at SMK An-Nur: freedom to choose projects was maintained, yet it was placed within a contextual approach close to

students' lives (children of oil-palm farmers and fishers) so that autonomy did not turn into a burden.

The projects selected displayed a spectrum from digital to non-digital, signaling pedagogical adaptation to resources and local culture. At Taruna Bhakti, projects included tutorial videos on wudhu/prayer, youth study podcasts, moral campaigns on social media, and social service activities (charity/iftar gatherings) completed within 3–4 weeks through phases of planning–implementation–finalization–presentation–reflection. At Al-Ikhlas, facility constraints instead gave rise to projects that were "simple but meaningful," such as *da'wah* posters, Islamic wall magazines, organizing congregational prayer, and small-scale social service around the school; the duration was also condensed (2–3 weeks) to match students' life rhythms, as some help their parents. At An-Nur, projects were framed as applicative praxis for coastal/plantation contexts: educational *akhlak* content via WhatsApp, mentoring younger classmates, anti-juvenile-delinquency campaigns, and even religious outreach in local communities, with monitoring conducted through WhatsApp groups so that feedback could remain quick amid limitations.

The "authentic" aspect appeared when project issues were tied to real problems experienced by students and then translated into measurable actions. Teachers at Taruna Bhakti mentioned issues such as adolescents' closeness to congregational prayer practices, social media ethics, and social concern as entry points for projects; impacts were assessed not only through "content," but also through behavioral mobilization (e.g., the number of students participating in congregational prayer). At the student level, these problems were unpacked through simple analytical steps: conducting a small survey, interviewing peers, identifying causes, and then designing solutions—so that students experienced practice in systematic thinking rather than merely completing assignments. At Al-Ikhlas, the authenticity of problems was more "grounded": neighborly etiquette, limited religious activities, and mutual care among peers; teachers broke complexity into smaller parts so it could be completed, and assessment emphasized the process of understanding root causes and the realism of solutions. At An-Nur, relevance was supported through examples of everyday work ethics (honesty in weighing harvest yields, trustworthiness at work) so that PAI did not stop at "norms," but became a moral guide that translates into concrete life situations.

The creativity dimension emerged as the ability to generate varied ideas, adapt when plans failed, and elaborate ideas into designs that could be executed. Teachers at Taruna Bhakti stimulated divergent thinking through open questions and "no-critique-yet" brainstorming practices, and then assessed creativity with rubrics that included originality and flexibility; examples of students' innovations were even noted, such as digital Islamic comics or ideas for a prayer reminder application. At the student level, that creativity appeared in forms aligned with the digital youth ecosystem, for instance the idea of creating an Instagram filter "quiz" on *akhlak* that would attract peers' attention. Yet in contexts with limited resources, creativity moved in the language of resilience (resourcefulness): Al-Ikhlas students described limited tools/costs (expensive poster board, limited data quotas) and addressed them with used cardboard, pooling contributions, and mutual cooperation; even "Islamic motivational cards" made from reused materials became a small but meaningful *da'wah* medium. At An-Nur, the same logic was present: students chose WhatsApp because it was more compatible with device access in their villages, and they

packaged the theme of social-media *akhlak* as a serial content set that could be widely shared.

Regarding achievement and evaluation, the appendix data show two things: (1) cognitive indicators moved upward, and (2) affective–skills indicators were in fact felt more tangibly by both teachers and students. Taruna Bhakti teachers reported that the average PAI score increased by about 8–12 points and emphasized a "deeper and more applicative" understanding; students also mentioned higher scores along with changes in how they learned—from listening to searching for references, discussing, and producing work. At Al-Ikhlas, the numerical increase was more moderate (around 5–8 points), but teachers emphasized increased activeness and motivation, while students felt assessment was fairer because effort in the process was also valued. Notably, the weighting scheme for assessment was adapted across schools: Taruna Bhakti weighed process (40%) and product (60%) with a clear rubric, while Al-Ikhlas chose a 50:50 composition to remain realistic and easy for students to understand. Pedagogically, these weight differences can be read as a strategy of contextual fairness: when resources are unequal, "product quality" should not be the only measure of learning dignity.

Overall, this set of findings depicts PjBL in PAI as both ethical work and pedagogical work: it opens space for student agency (choosing, designing, weighing impacts), but it also demands teachers' sensitivity to care for differences (technology access, time, economic burdens, local culture). On the one hand, students experienced a transformation of learning habitus—"more responsible" because the project was understood as their own work. On the other hand, teachers emphasized the importance of rubrics and monitoring so that freedom does not turn into confusion. In more theoretical terms, learning moves toward a constructivist direction: knowledge is not "transferred down," but built through social dialogue, practice, and reflection; meanwhile, its humanism appears when projects bridge faith with lived experience—from social media ethics to work trustworthiness and social concern—so that PAI is present as values education that is truly experienced rather than merely memorized (Thomas, 2000; Krajcik & Blumenfeld, 2006; Bell, 2010).

Impact on Students' Creativity

The impact of PjBL on students' creativity is seen primarily in the originality of ideas and the variety of product forms produced across the three schools. Interview–observation data show that students are no longer confined to a single assignment format, but instead dare to propose different ideas and translate them into tangible works: at SMK Taruna Bhakti, *da'wah* video projects and educational social-media content emerged; at SMK Al-Ikhlas, creativity appeared largely through written works, Islamic poetry, and posters campaigning Islamic ethics; while at SMK An-Nur, students developed projects grounded in the local context such as honesty campaigns in traditional markets and rural social activities. Creativity is also visible in the ability to elaborate ideas: an initially simple idea develops into a more complex project—for example, a *da'wah* video arranged complete with a concept, script, and editing process; or an idea for a social activity that is then complemented with a proposal, budget plan (RAB), documentation, and an accountability report. From the teachers' perspective, this change is considered "significant" because after PjBL students become more willing to propose unique ideas (even to the point of innovations such as a prayer reminder application or a digital Islamic comic), and

creativity assessment is made more operational through rubrics that weigh originality, idea fluency, and thinking flexibility.

The next creativity indicators are further strengthened in problem-solving, active engagement, and the quality of collaboration during the project. Students explained that projects were deliberately linked to real problems—such as social media ethics or juvenile delinquency—and then carried out through analytical steps: observation, discussion, seeking information from friends/parents/community, identifying causes, and selecting solutions that could realistically be applied. At the level of learning experience, that creative space felt more "spacious": one student asserted that in PjBL they are "free to be creative—whether making videos, posters, dramas, campaigns," and the classroom climate becomes safer for trying things out because the teacher emphasizes that ideas need to be tested, not laughed at. Even when facing constraints typical of SMKs (facilities/data quotas, distance from home, the burden of helping parents, and group coordination), students demonstrated creativity as resourcefulness—sharing devices, taking turns for access, and using WhatsApp to organize teamwork—which ultimately shows that the creativity that grows is not only "new ideas," but also the ability to collaborate and find realistic ways out within limitations.

Impact on PAI Learning Achievement

The data show that PjBL affects not only "scores," but also the quality of understanding and learning performance visible in the classroom. Cognitively, teachers observed that students are better able to connect PAI concepts with everyday situations; affectively, students become more disciplined, responsible, and cooperative in project work; and psychomotor-wise, students become more skilled in practicing worship while also producing works with educational–religious value. This finding aligns with teachers' accounts that communication/presentation skills and teamwork develop strongly after PjBL, while in terms of quantitative outcomes teachers also reported that average scores increased by about 8–12 points after the implementation of PjBL and students stated that assignment/exam scores became better than before PjBL. This change is supported by a more transparent authentic evaluation system—rubrics are explained from the start, assess both process and product, and provide detailed feedback—so that students understand learning targets and the expected performance standards.

Supporting and Inhibiting Factors in Implementation

Across the three research sites, the main supporting factors emerged at the levels of teachers, students, schools, and the surrounding environment. PAI teachers played a dominant role because they were able to modify the PjBL steps to fit students' characteristics—ranging from designing projects, guiding discussions, to facilitating evaluation. Student support was also strong: they were enthusiastic from the planning stage through to presentation, driven by a desire to demonstrate their abilities and to take responsibility for the group's outcomes. Even at the practical level, students illustrated projects closely aligned with their interests—for example, creating *da'wah* video content on adolescent *akhlak*—which made PAI feel "alive" and relevant. At the school and community levels, principals provided space for innovation and additional time for project activities (including exhibitions of project outcomes),

while community support was most visible at SMK An-Nur through direct involvement in students' socio-religious activities.

The most consistent inhibiting factor was the limited instructional time for PAI within the SMK curriculum—reported in these findings as generally only two lesson hours per week—so teachers found it difficult to complete all project stages and some projects had to be simplified to fit the schedule. Another obstacle was facilities: limited multimedia tools, practical materials, and internet access, especially at SMK An-Nur, forced teachers to seek simpler alternatives. Students' accounts also underscored problems of device/data-quota access, residential distance, and time management due to other subjects as well as obligations to help parents. At the classroom level, variations in ability/motivation created a need for intensive guidance and the risk of unequal group contributions (free riders). In addition, limited teacher training on project assessment as well as pressure from administrative–curricular workloads also constrained PjBL flexibility.

The strategies for overcoming obstacles that appear in the data are adaptive and contextual: (1) simplifying project design so that it remains meaningful yet realistic within the available time allocation, (2) leveraging local resources (e.g., posters, simple materials) when facilities are limited, and (3) integrating projects with school religious activities and strengthening collaboration among teachers so that the burden of mentoring and executing projects is more manageable. In school contexts with limited facilities, teachers also chose simple but still applicative projects—such as *da'wah* posters, Islamic wall magazines, or school religious gatherings—as a way to maintain relevance without burdening students in terms of cost or technology.

Discussion

The findings of this study reinforce the argument that PjBL becomes effective not merely because "there is a project," but because of its learning mechanism: authentic tasks that require problem solving, collaborative work, and accountable products; and because teachers shift their role from content deliverers to designers of learning experiences—providing driving questions, achievement targets, milestones, and rubrics that guide quality standards. This pattern aligns with findings from recent studies showing that PjBL is associated with strengthened creativity, collaboration, communication, conceptual understanding, motivation, and problem solving when its implementation steps are structured and not "released" without scaffolding (Guo et al., 2020; Auliyani et al., 2024).

In the SMK context, the effectiveness of PjBL becomes more tangible when projects are designed close to vocational realities: there are workplace needs, there is a local context, and there are demands for 21st-century skills (creativity, collaboration, critical thinking, communication) that indeed constitute the "language" of vocational education. At this point, PjBL functions as a bridge between technical competencies and cross-cutting competencies (life and career skills), so that learning does not stop at memorizing concepts, but moves toward practice, negotiating roles within a team, and evidence-based decision making—precisely the competencies frequently highlighted in systematic reviews of PjBL in vocational education (Rozan et al., 2024).

However, PjBL does not automatically succeed in SMK PAI; it tends to be effective when (1) the project is positioned as value practice—for instance, social services, ethics campaigns, or religious literacy products—supported by attitude–

performance–product rubrics; (2) there is monitoring and formative feedback throughout the process (progress checklists, reflective journals, teamwork logs), rather than assessment only at the end; and (3) the support of the school ecosystem enables time management and coordination across activities. Conversely, PjBL weakens when rubrics are unclear, monitoring is minimal, or authentic assessment is not ready—because individual contributions in group work become difficult to trace and value reflection can easily turn into slogans. The PjBL assessment literature emphasizes that specific rubrics, formative assessment, and evidence of process (logs, journals, teacher observations) are key to maintaining accountability as well as learning quality (Vlachopoulos, 2024; Yusri et al., 2024).

The findings of this study show that projects in PAI function as a pedagogical mechanism that concretizes values and *akhlak* into observable social practices. When students design *da'wah* content (posters/videos), carry out social service activities, or develop ethics campaigns within the school environment, they do not merely "repeat" the material, but negotiate the meaning of values through action: selecting issues, shaping messages for specific audiences, dividing roles, resolving field constraints, and reflecting on their impact. This pattern aligns with studies of PjBL in PAI which emphasize that meaningful projects grounded in real problems tend to strengthen religious attitudes and character because values are situated in practical contexts rather than remaining at the level of discourse (Faisal et al., 2023; Komala et al., 2025).

In the context of vocational education, PjBL in PAI will be more effective when its projects are relevant to the SMK ecosystem—for example, linking work ethics, honesty, responsibility, and social care to production/service activities, public communication, or entrepreneurship initiatives that are realistic for students. Research in other SMKs shows that PAI projects that mobilize real experiences (including teamwork, product creation, and presentation) can become a space for practicing creativity as well as habituating values (Samsiadi & Romelah, 2022). The contextual contribution of this article—in a regency setting such as Indragiri Hilir—lies in affirming that "PAI creativity" does not have to be synonymous with high technology; it can grow through projects that adapt to limited instructional time, local resources, and support from the school community, as long as the design sustains collaboration, accountability, and value reflection (Komala et al., 2025).

Substantively, the findings indicate that improved PAI learning achievement is not merely "numbers," but also the depth of understanding and the ability to communicate ideas. Across the three schools, teachers judged learning outcomes to improve because students were encouraged to connect PAI concepts with concrete situations through projects; this is reflected in teachers' reports of an average score increase of "around 8–12 points" and explanations that students "understand the material better because they work on projects directly," followed by an assessment format combining process and product (e.g., 40% process, 60% product). From students' perspectives, improved understanding was also articulated through experiences of project presentations and discussions, for instance admissions that scores rose from an initial range to a higher range after the project was completed. This pattern aligns with systematic review findings that PjBL tends to correlate positively with learning achievement, engagement, and performance-based learning outcomes when tasks are authentic and assessed with clear criteria (Guo et al., 2020; Yusri et al., 2024), and it is further reinforced by the authentic assessment literature

emphasizing the importance of rubrics, feedback, and task–competency alignment (Vlachopoulos & Makri, 2024).

However, this improvement in achievement needs to be read with methodological caution. First, some achievement indicators come from school documents and teacher assessments, which may contain variability in standards across teachers/classes and a "halo" effect when students appear active during projects; therefore, claims of score increases are more appropriately positioned as contextual indications rather than causal evidence. Second, the SMK context—especially PAI—has structural constraints such as limited instructional time (2–3 lesson hours), facilities/technology that are not always adequate, and challenges to the consistency of authentic assessment. The authentic assessment literature emphasizes that the reliability of performance assessment depends heavily on clear criteria, consistent rubric application, and the quality of feedback; without these, project assessment can easily become "descriptive" but less comparable (Vlachopoulos & Makri, 2024). Therefore, the realistic implication is not to demand "higher numbers" as the sole indicator, but to strengthen alignment among PAI objectives, project design, and auditable learning evidence (e.g., portfolios, project artifacts, and traces of reflection) (Villarroel et al., 2024).

Field findings show that supporting and inhibiting factors operate across three mutually reinforcing levels. At the teacher level, the success of PjBL is primarily supported by pedagogical competence and commitment: teachers who can design projects that are simple yet meaningful tend to be more successful in maintaining the rhythm of group work and ensuring that each student has a role. At the school level, the principal's support emerges as a key factor, for example by providing space/time flexibility and supporting exhibitions of project outcomes that allow students' work to be institutionally "recognized." At the environmental level, community support and the availability of local resources become important levers because PAI projects can "land" in social practices that are close to students' everyday lives. This multi-level pattern is consistent with PjBL scholarship that emphasizes the teacher's role as a facilitator, the importance of school organizational support, and the prerequisite of resources for PjBL to run stably (Guo et al., 2020; Yusri et al., 2024).

Meanwhile, inhibiting factors—limited time (2–3 lesson hours), facilities/internet access, and difficulties in authentic assessment—require time-efficient mitigation strategies that still preserve quality. The findings show that schools/teachers attempted to address these constraints by integrating projects into school programs, leveraging local resources, and simplifying the project scope so that it can still be completed within the available timeframe. At the classroom practice level, teachers also made technical adaptations (for example, relying on coordination via mobile phones/WhatsApp when device access is limited) and breaking project work into small tasks that can be completed outside face-to-face hours. The authentic assessment literature supports this direction of mitigation: project assessment becomes more feasible when rubrics are streamlined into core indicators, accompanied by brief but regular feedback (Vlachopoulos & Makri, 2024), and when tasks are designed realistically for vocational contexts so that products/performances genuinely represent the targeted competencies (Villarroel et al., 2024).zyg). Operationally, the implication is: (1) a "concise-adaptive" PAI project template by theme, (2) a one-page rubric measuring process–product–reflection, and (3) cross-

subject/curriculum teacher collaboration to ensure that PAI projects are relevant to vocational competencies without overburdening limited PAI instructional time.

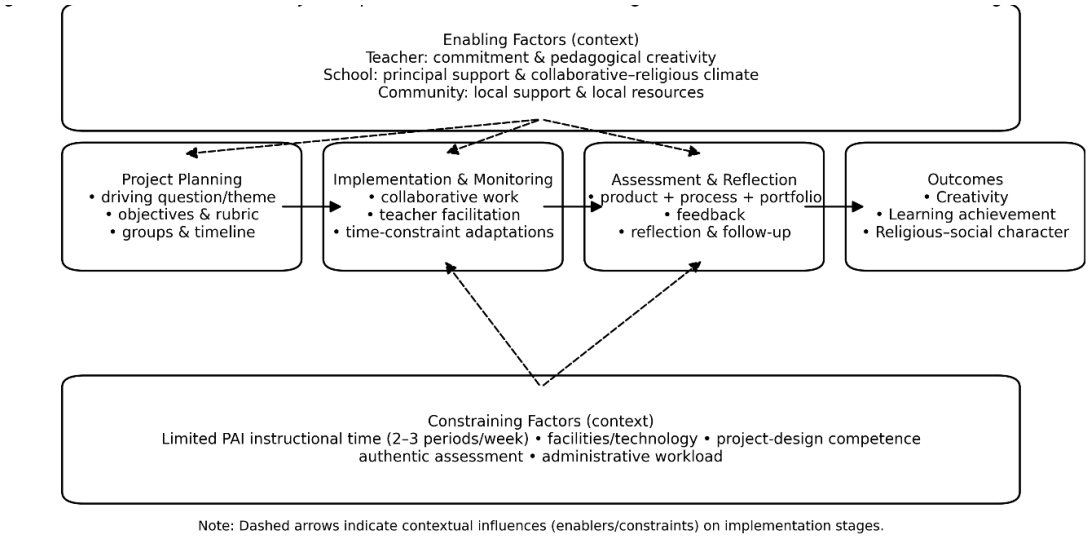

Figure 1. Mechanism model of PjBL implementation in Islamic Religious Education (PAI) in vocational high schools
Source: Research Data, 2025

This study contributes by presenting a map of the implementation mechanism of PjBL in PAI within the context of vocational SMKs, starting from how projects are designed to "fit" the school rhythm to how projects are linked to local resources and school programs—rather than merely reporting the final outputs. Field findings show that the strategies that work best are integrating projects into religious/school activities and maximizing the resources available around the school, so that limitations of facilities and time do not automatically shut down projects. At the practical level, this article also offers implementable recommendations for PAI teachers—ranging from contextual project design, strengthening authentic assessment, to the need for capacity building through training—which are relevant to managing learning in vocational schools. Thus, this article complements a tendency in the PjBL literature that is often stronger in reporting impacts but weaker in providing a detailed account of the "working mechanisms" of classroom implementation (Guo et al., 2020).

The limitations of this study should be read with clarity. Although it is multi-site (three SMKs), the context remains within a single regency, so the transferability of the findings depends heavily on the similarity of school characteristics and community support. In addition, indications of "achievement" rely on school assessment documents and teacher assessments, which may contain institutional bias or social bias (for example, a tendency to present practices perceived as "good"). Therefore, future research can be directed toward mixed-methods designs—combining qualitative traces of implementation with more stable measurements (pre–post designs, standardized rubrics, or validated creativity instruments), as well as cross-regency comparisons to test contextual factors. Another realistic agenda is testing more specific, practice-based teacher training interventions, because the literature shows that PjBL professional development tends to strengthen "structural"

practices (managing projects) but does not always strengthen "goal" practices such as task authenticity and iteration-reflection (Farrow et al., 2022).

Conclusion

Overall, this study shows that the implementation of Project-Based Learning (PjBL) in PAI instruction across three SMKs in Indragiri Hilir Regency is effective when teachers are able to design contextual projects, guide student collaboration through consistent monitoring, and close the learning cycle with rubric-based assessment and reflection. The findings indicate that PjBL not only activates learning but also concretizes PAI's religious–social values into observable practices through project products and activities, so that students' creativity grows in the form of originality of ideas, variation of works, and the ability to solve problems collaboratively. At the same time, PAI learning achievement tends to increase—particularly in conceptual understanding and presentation/argumentation skills—although achievement indicators still rely on school documents and teacher assessments. Implementation success is supported by principal support, a religious-collaborative school climate, and the use of local resources, while the main obstacles include limited PAI instructional hours, facilities/technology, and teachers' competence in project design and authentic assessment. Therefore, the practical recommendations of this study emphasize the need for concise yet meaningful project design, strengthening rubrics and process evidence (portfolios/reflections), and school–community collaboration so that PjBL in PAI remains feasible and impactful in the SMK context.

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