Journal of Information System Research (JOSH)
Volume 5, No. 4, Juli 2024, pp 1425−1435
ISSN 2686-228X (media online)
https://ejurnal.seminar-id.com/index.php/josh/
DOI 10.47065/josh.v5i4.5505

Project Monitoring and Assessment System Design Using Rapid and Participatory Application Development Framework

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Submitted: **06/07/2024;** Accepted: **31/07/2024;** Published: **31/07/2024**

Abstract−This study investigates the implementation of Rapid and Participatory Application Development (RPAD) in educational settings, emphasizing its urgent necessity in enhancing project-based learning environments. Given the rapid pace of technological advancements and the evolving demands of modern education, there is an urgent need for innovative methodologies that can effectively integrate digital tools into the learning process. RPAD's iterative development process and active user involvement ensure the creation of functional and user-centric applications. The findings demonstrate that RPAD facilitates timely feedback, continuous improvement, and the effective integration of digital tools, enriching the learning experience and aligning theoretical knowledge with real-world applications. This methodology drives substantial improvements in teaching methodologies and student engagement and ensures that educational institutions remain adaptive and future-ready. The study concludes that adopting RPAD is crucial for enhancing the effectiveness and relevance of contemporary education, addressing current challenges, and preparing for future demands.

Keywords: RPAD; Students Project; Monitoring; Assessment; Project-Based Learning

1. INTRODUCTION

The challenges of education in the digital era encompass optimizing, monitoring, and evaluating project-based learning outcomes to ensure the practical utility of projects for end-users. Effective monitoring and evaluation methods are crucial for assessing student projects' relevance and applicability, fostering an environment where educational outputs align with real-world demands [1], [2]. This process involves systematically collecting and analyzing data, utilizing advanced digital tools to provide accurate insights into the efficacy of learning activities [3], [4]. Ultimately, refining these methods will bridge the gap between academic exercises and user-centric applications, promoting educational practices that are both innovative and impactful.

Implementing project-based learning approaches demands creativity and technological innovation to address socio-cultural, economic, and environmental challenges. Effective project outcomes hinge on the strategic integration of advanced tools and methodologies, ensuring that solutions are relevant and beneficial to users [5], [6]. Rigorous monitoring and evaluation processes are indispensable, verifying that projects align with user needs and expectations [7], [8]. Consequently, continuous assessment validates the practical application of student work and fosters a culture of excellence and responsiveness in educational endeavors.

Using digital technology to enhance project control functions represents an innovative step in expediting assessment processes and measuring system benefits based on user recognition. Integrating advanced digital tools facilitates the efficient collection and analysis of data, streamlining evaluation procedures and ensuring timely feedback [9]–[12]. This approach accelerates the overall assessment cycle and provides accurate insights into implemented systems' effectiveness and user acceptance [13]–[15]. Ultimately, leveraging digital solutions in project management fosters a more responsive and user-centric evaluation framework, driving continuous improvement and innovation.

This research aims to design a student project monitoring and assessment application using the Rapid and Participatory Application Development framework. This framework ensures the development process is swift and inclusive, incorporating feedback from various stakeholders to enhance the application's functionality [16]–[18]. The iterative nature of this approach facilitates continuous improvement, resulting in a tool that effectively meets educational needs [19]. By leveraging this methodology, the study anticipates producing a robust application that significantly enhances project evaluation and monitoring, ultimately contributing to improved academic outcomes.

The urgency of this research lies in addressing the critical need for practical tools in monitoring and assessing student projects in an increasingly digital academic environment. Advanced educational technologies are essential for timely feedback and ensuring project outcomes align with educational objectives [20]–[22]. The rapid evolution of digital tools necessitates ongoing research to develop innovative solutions that enhance learning experiences [23], [24]. Therefore, this study is pivotal in advancing educational methodologies, ensuring that academic institutions remain at the forefront of technological integration and efficacy in project-based learning.

This research's theoretical and practical implications extend significantly into academic and applied realms. Theoretically, the study contributes to the body of knowledge on digital tools for educational assessment, providing a robust framework for future research in similar domains. Implementing the developed application will offer

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educators a sophisticated real-time project monitoring and evaluation tool, enhancing educational outcomes. The integration of this technology into academic settings underscores the pivotal role of innovative solutions in modern education, ultimately fostering an environment that is both adaptive and forward-thinking.

Similar research has explored the integration of digital tools in educational assessment, yet the limitations of this study are primarily rooted in its methodology and specific academic context [25]–[27]. The chosen methodological approach may restrict the generalizability of the findings, given its focus on a particular educational setting. Additionally, variations in academic environments challenge applying the results universally. Nonetheless, this research provides valuable insights that can inform future studies and adaptations in diverse educational landscapes despite its contextual and methodological constraints.

2. RESEARCH METHODOLOGY

2.1 Gap Analysis

A gap analysis is essential to identify previous studies' progress in optimizing project-based learning approaches, particularly in tourism. This analytical process enables assessing existing research, highlighting areas for further exploration and improvement. By systematically examining the current literature, it becomes evident where the gaps in knowledge and practice lie, thus providing a roadmap for future research. Ultimately, such an analysis is pivotal for advancing the application of project-based learning in tourism, ensuring that educational practices remain relevant and effective in addressing industry needs.

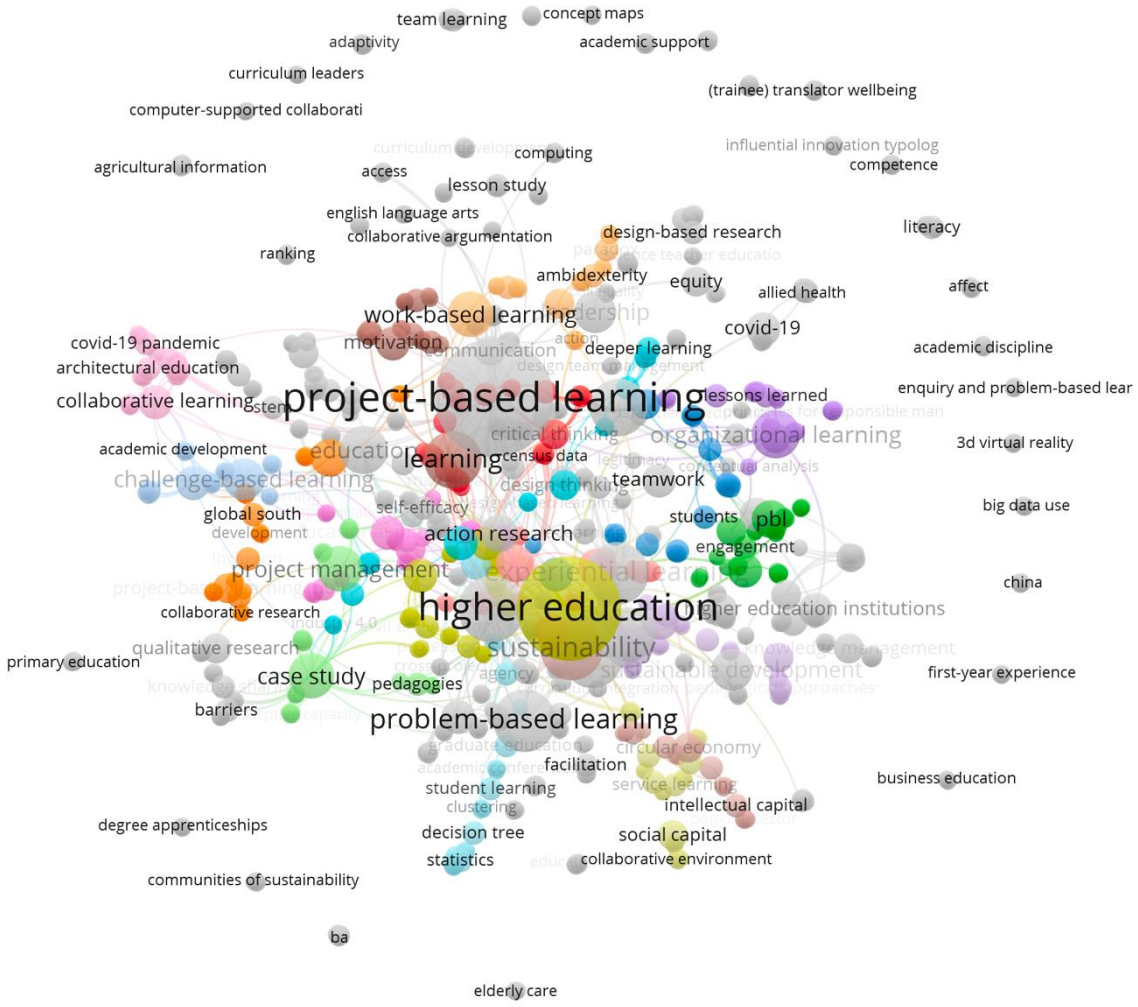

Figure 1. Network Visualization of Project-based Learning Topics

Figure 1 shows the gap analysis using Vosviewer. Based on the identified gaps, it is evident that digital technology can be designed to optimize the monitoring and evaluation processes of project-based learning approaches. Advanced digital tools offer enhanced real-time data collection, analysis, and feedback capabilities, which are critical in educational settings. Implementing these technologies ensures that project outcomes are rigorously assessed, aligning with educational goals and user needs. Thus, leveraging digital solutions streamlines

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the evaluation process and significantly enhances the effectiveness and efficiency of project-based learning methodologies.

The gap analysis reveals that the Rapid and Participatory Application Development approach is highly relevant for designing and developing applications for monitoring and evaluating student projects in the tourism sector. This method's iterative and inclusive nature ensures that stakeholder feedback is continually integrated, enhancing the application's functionality and user acceptance. Its rapid development cycles also allow for timely adjustments and improvements, which are crucial in dynamic educational environments. Therefore, employing this approach in tourism education ensures the creation of robust and user-centric monitoring tools, significantly advancing project-based learning practices.

2.2 Rapid and Participation Application Development

The Rapid and Participatory Application Development approach is highly relevant for identifying user needs and involving users in application design. This methodology emphasizes continuous user engagement, ensuring that the end product effectively addresses the actual requirements and preferences of its users. This approach enhances the application's usability and functionality by incorporating feedback throughout development. Consequently, utilizing Rapid and Participatory Application Development fosters the creation of user-centric applications well-suited to meet specific demands, ultimately leading to more successful and widely accepted technological solutions.

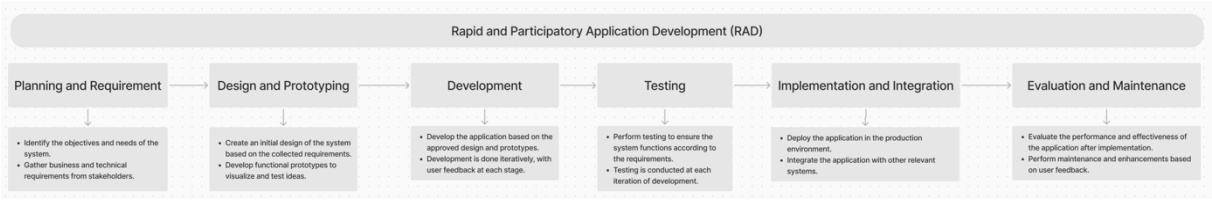

Figure 2. Rapid and Participation Application Development

Figure 2 shows the implementation of Rapid and Participation Application Development for system design. Rapid and Participation Application Development constitutes a highly pertinent framework in student project assessment application development, owing to its demand for active user engagement. This approach emphasizes iterative feedback loops and user-centered design, ensuring that the final product aligns closely with user requirements and expectations. Engaging users throughout the development process enhances the application's functionality and usability and fosters a sense of ownership and commitment among stakeholders. The iterative nature of this framework promotes continuous improvement, thereby refining the application to meet educational objectives effectively. In conclusion, integrating active user participation in application development significantly contributes to producing robust and user-friendly tools for academic assessments.

The stages involved in implementing Rapid and Participation Application Development encompass a structured sequence that ensures comprehensive development and user satisfaction. Initially, the Planning and Requirement phase identifies the project's scope and user needs, laying a solid foundation for subsequent activities. This is followed by the Design and Prototyping stage, where conceptual designs are created, and user feedback is integrated into iterative prototypes. Development then translates these designs into functional code, while Testing ensures that the application meets quality standards. Subsequent Implementation and Integration involve deploying the application in a real-world environment and ensuring seamless functionality with existing systems. Finally, the Evaluation and Maintenance phase provides continuous monitoring and improvements, guaranteeing long-term efficacy and adaptability. This structured approach ensures that each phase contributes to a robust and user-centric application, ultimately enhancing the project's success.

2.2.1 Planning and Requirement

During the Planning and Requirement phase, the process involves identifying the objectives and needs of the system while gathering technical requirements from users. Initially, this stage seeks to define clear system goals and ensure that these align with user expectations and organizational objectives. Concurrently, technical specifications are meticulously collected from users to guide the subsequent development stages. This dual focus establishes a solid foundation for the project's direction and enhances the likelihood of developing a functional and user-centric system. Consequently, this comprehensive approach in the Planning and Requirement phase significantly contributes to the overall success and effectiveness of the application.

Table 1. User Requirement

User	Requirement
Lecture	Lecturers require information including student names, student identification numbers, assignment descriptions, document links, and downloadable files to facilitate the assessment process. Initially, obtaining accurate student identifiers and assignment details is crucial for

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User	Requirement
	maintaining organized records and ensuring precise evaluation. Additionally, access to document links and downloadable files allows for thorough review and grading of student work. This comprehensive data collection supports a structured and efficient assessment system, enhancing the accuracy and fairness of the grading process. Ultimately, such a meticulous approach ensures that evaluations are based on well-documented and accessible information.
Student	Students require access to input information such as their names, student identification numbers, assignment descriptions, document links, and files to be stored in the database for lecturer evaluation. Initially, this access allows students to accurately and efficiently submit their work, ensuring all necessary details are included for assessment. Additionally, storing this information in a centralized database facilitates organized record-keeping and easy retrieval by lecturers. This system not only streamlines the submission process but also enhances the transparency and efficiency of the evaluation process. Ultimately, providing such access significantly contributes to a fair and systematic assessment framework.

Table 1 describes the system's user requirements. In evaluating student projects, users require data from assignments spanning seven meetings before the midterm exam and the midterm project itself. Subsequently, data from an additional seven meetings following the midterm exam and the final exam project is essential. This structured approach to data collection ensures a comprehensive assessment of student performance over the entire course duration. Educators can provide more accurate and meaningful evaluations by systematically gathering and analyzing pre-midterm and post-midterm data. Ultimately, this method enhances the overall effectiveness and reliability of the project assessment process.

2.2.2 Design and Prototyping

During the Design and Prototyping phase, an initial design of the system is created based on the collected requirements, and the concept is visualized using a use case diagram. This phase begins with translating user requirements into a coherent design framework, addressing all functional and non-functional aspects. Subsequently, the use case diagram serves as a visual tool to illustrate system interactions, aiding in the clarification of roles and processes. Visualizing the system's functionality can identify and address potential issues early in the development cycle. Ultimately, this structured approach enhances the precision and effectiveness of the system's design, laying a solid foundation for subsequent development stages.

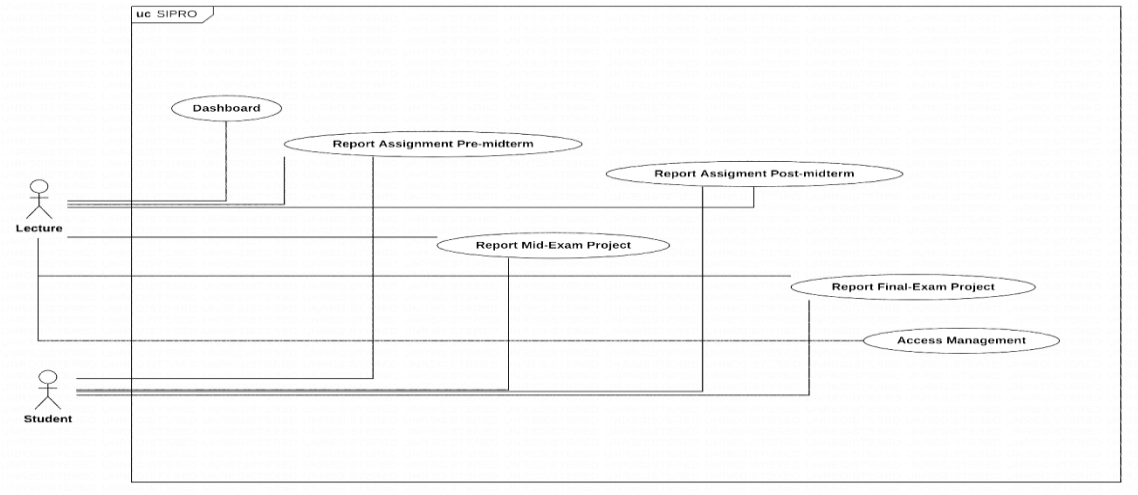

Figure 3. Use Case Diagram for the SIPRO System

Figure 3 shows the use case of the SIPRO system. The Project Assessment System (SIPRO) use case diagram illustrates that lecturers monitor student activities from assignment completion through midterm and final projects. This diagram effectively maps out the interactions between lecturers and the system, highlighting the continuous oversight and evaluation process. By depicting these interactions, the diagram ensures that all phases of student work are subject to scrutiny, enhancing accountability and feedback quality. Such a comprehensive monitoring framework supports timely intervention and guidance and ensures the integrity and rigor of the assessment process. Ultimately, this visualization reinforces the system's role in maintaining high academic standards.

The advantage of the Project Assessment System (SIPRO) is its ability to visualize assignments and midterm and final projects based on location by displaying the coordinates of student-developed projects. This feature enhances the system's functionality by providing a spatial representation of project data, making assessing student work's geographical relevance and impact easier. Moreover, visualizing project locations can facilitate

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better tracking of progress and resource allocation. Integrating geographic coordinates into the assessment process adds a valuable dimension to project evaluation and promotes a more comprehensive understanding of the project's real-world applications. Ultimately, this capability significantly enhances the robustness and effectiveness of SIPRO.

2.2.3 Development

In the Development phase, the process involves developing the application based on the approved design and prototypes. This phase is carried out iteratively, ensuring user feedback is incorporated at each stage to refine and enhance the system. Continuous user engagement during development helps identify potential issues early and aligns the application closely with user needs and expectations. Iterative development improves the application's functionality and usability and fosters a collaborative environment between developers and users. Ultimately, this approach ensures the delivery of a robust and user-centric application that effectively meets its intended purpose.

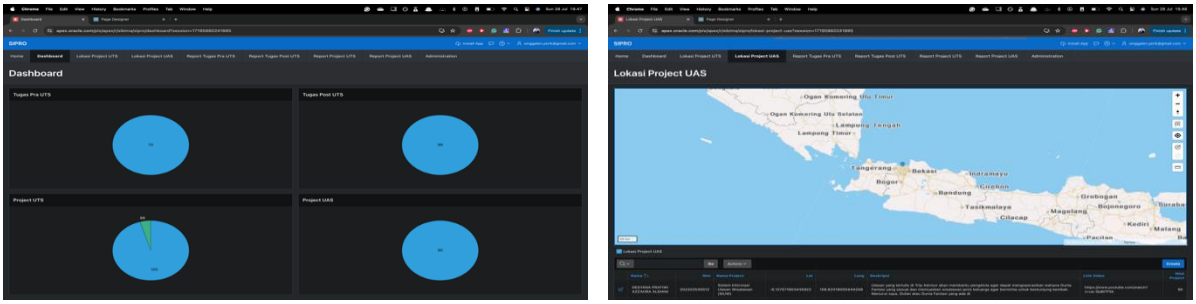

Figure 4. Prototype Development

Figure 4 shows the prototype development. The development of the prototype reveals that lecturers monitor student learning activities through assignments and projects while integrating the project locations with digital maps to ascertain regional contributions. This monitoring allows for a detailed student engagement and performance analysis, providing insights into individual and collective progress. Additionally, integrating digital maps facilitates a spatial understanding of project impacts, highlighting the geographic distribution of student efforts. This dual functionality enhances the monitoring process's comprehensiveness and promotes a greater understanding of regional educational contributions. Ultimately, this approach ensures a robust and insightful evaluation of student activities and their implications.

Based on the prototype development results, the Project Assessment System (SIPRO) streamlines the evaluation of student projects by leveraging digital technology, eliminating the need for conventional paper-based methods. This digital approach simplifies the submission, review, and grading processes, ensuring all data is systematically organized and easily accessible. Additionally, SIPRO enhances efficiency by reducing the administrative burden of paper handling and storage. Embracing this technological advancement modernizes the assessment process and promotes environmental sustainability by reducing paper consumption. Ultimately, SIPRO significantly improves the academic evaluation framework, offering a more efficient and eco-friendly solution.

2.2.4 Testing

In the Testing phase, performance testing ensures the system functions according to the requirements. This process verifies that each component operates correctly and efficiently, aligning with the predefined specifications. Testing occurs iteratively, with each development cycle subjected to rigorous evaluation to promptly identify and rectify any issues. This continuous testing approach enhances the system's reliability and performance, ensuring it meets user expectations and functional criteria. Ultimately, thorough testing at every iteration is crucial for delivering a robust, high-quality system that fulfills all specified requirements.

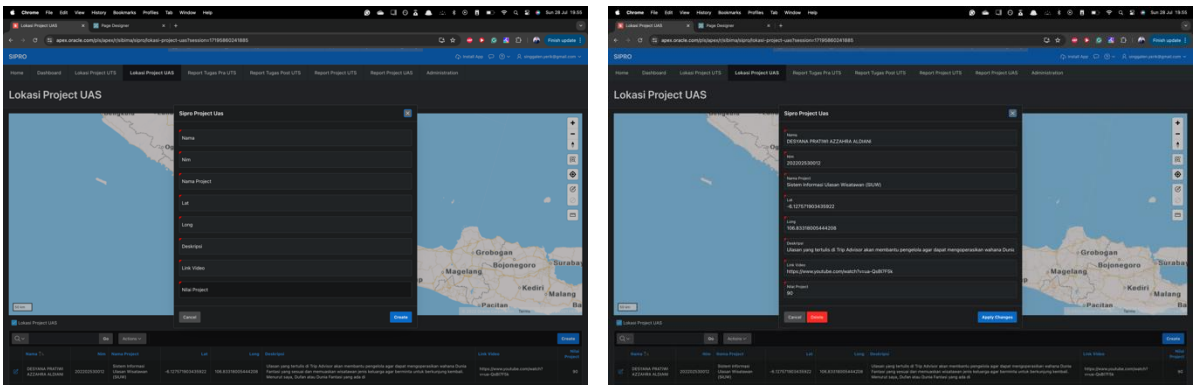

Figure 5. Testing The System Functions

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Figure 5 shows the testing result of the system function. Testing the system function aims to ensure that each button operates correctly when creating, editing, reading, and deleting data. Initially, this testing verifies that the create function allows users to input and save new data accurately. Simultaneously, the edit function is evaluated to confirm that data modifications are correctly implemented and saved. The read function is also tested to guarantee efficient data retrieval and correct information display. In contrast, the delete function is scrutinized to remove data as intended. This thorough testing process is critical for validating the system's overall functionality and reliability, providing confidence in its operational effectiveness.

After conducting system trials, both lecturers and students as users can access each page of the system effectively and perform the Create, Read, Update, and Delete (CRUD) functions seamlessly. This accessibility ensures users interact with the system intuitively, facilitating smooth navigation across various sections. Moreover, the successful implementation of CRUD functionalities indicates that data management processes, from inputting new information to updating existing records and removing outdated entries, are efficient and reliable. Such comprehensive user access and functionality underscore the system's robustness and user-friendliness, ultimately enhancing the overall user experience and operational efficiency.

2.2.5 Implementation and Integration

The developed system is integrated into the HTM208 Tourism Information Systems Management course through the Rencana Pembelajaran Semester (RPS) to facilitate project-based learning monitoring and evaluation. Initially, this integration ensures that the system aligns with the course objectives and learning outcomes, providing a structured framework for assessing student projects. Furthermore, incorporating the system into the curriculum allows for real-time tracking and evaluation of student progress, enhancing the overall effectiveness of the teaching and learning process. This alignment promotes a hands-on, practical approach to learning and ensures continuous improvement through systematic feedback and assessment. Ultimately, this integration significantly contributes to a comprehensive and dynamic educational experience.

Integrating SIPRO with the RPS allows monitoring of each student project based on location, which can be further aligned with the MBKM program. This capability enables educators to track student projects' geographical distribution and impact, ensuring alignment with the program's experiential learning goals. Moreover, spatial data integration facilitates comprehensive oversight, enhancing the ability to provide targeted support and resources to students. This synergy between SIPRO and Merdeka Belajar Kampus Merdeka (MBKM) enriches the academic experience and promotes a practical understanding of project impacts across different regions. Ultimately, this integration supports a more effective and location-aware evaluation process.

2.2.6 Evaluation and Maintenance

In the Evaluation and Maintenance phase, the process involves evaluating the performance and effectiveness of the application after implementation, as well as performing maintenance and enhancements based on user feedback. Initially, this phase focuses on assessing how well the application meets its intended goals and identifying any areas for improvement. Subsequently, user feedback is systematically gathered and analyzed to inform necessary updates and enhancements, ensuring the application remains relevant and functional. This continuous improvement cycle is crucial for maintaining high performance and user satisfaction standards. Ultimately, thorough evaluation and responsive maintenance ensure the application's long-term success and usability.

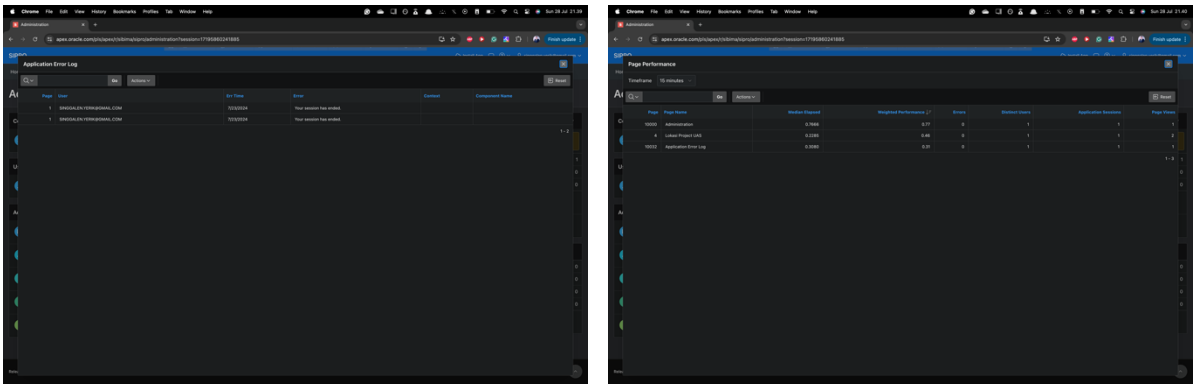

Figure 6. Error Log and Page Performance

Figure 6 shows the error log and page performance. Evaluation and maintenance are conducted based on error logs and page performance. Initially, error logs provide detailed records of system issues, enabling precise identification and rectification of faults. Page performance metrics like load times and responsiveness offer insights into the application's efficiency and user experience. By analyzing these data sources, targeted improvements can be made to enhance overall functionality and reliability. This methodical approach ensures the

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system remains robust and responsive to user needs. Ultimately, leveraging error logs and performance metrics for evaluation and maintenance significantly contributes to the sustained success of the application.

Based on continuous evaluation and maintenance, SIPRO will be developed in alignment with the evolving needs of users to optimize course project assessments. Initially, this iterative process ensures that the system adapts to the dynamic requirements of educational environments, providing tailored functionalities. As user feedback is incorporated, the system's capabilities are enhanced, fostering a more efficient and effective assessment process. This commitment to ongoing improvement addresses current user demands and anticipates future needs, ensuring sustained relevance and utility. Ultimately, this approach guarantees that SIPRO remains a vital tool in academic project evaluations.

3. RESULT AND DISCUSSION

The discussion on the results of SIPRO's design is divided into two sections: the design and implementation of SIPRO and the discussion on optimizing digital technology in project-based learning. The design and implementation section initially details the systematic approach to developing and integrating SIPRO into the educational framework, highlighting key features and user benefits. Following this, the discussion on digital technology focuses on how SIPRO enhances the project-based learning experience by leveraging innovative tools and methodologies. This dual approach ensures a comprehensive understanding of both the technical and pedagogical impacts of SIPRO. Ultimately, this structured discussion facilitates a deeper insight into the system's capabilities and role in modernizing education.

3.1 Design and Implementation of Sistem Informasi Penilaian Project (SIPRO)

The design of SIPRO is inherently linked to innovative steps in optimizing digital technology to support project-based learning. Initially, this approach integrates advanced technological tools to streamline student project creation, submission, and evaluation. Furthermore, the system's digital framework facilitates real-time feedback and continuous improvement, enhancing the learning experience. Such strategic use of technology modernizes traditional educational practices and fosters a more interactive and engaging learning environment. Ultimately, SIPRO's design represents a significant advancement in leveraging digital solutions to enrich project-based education.

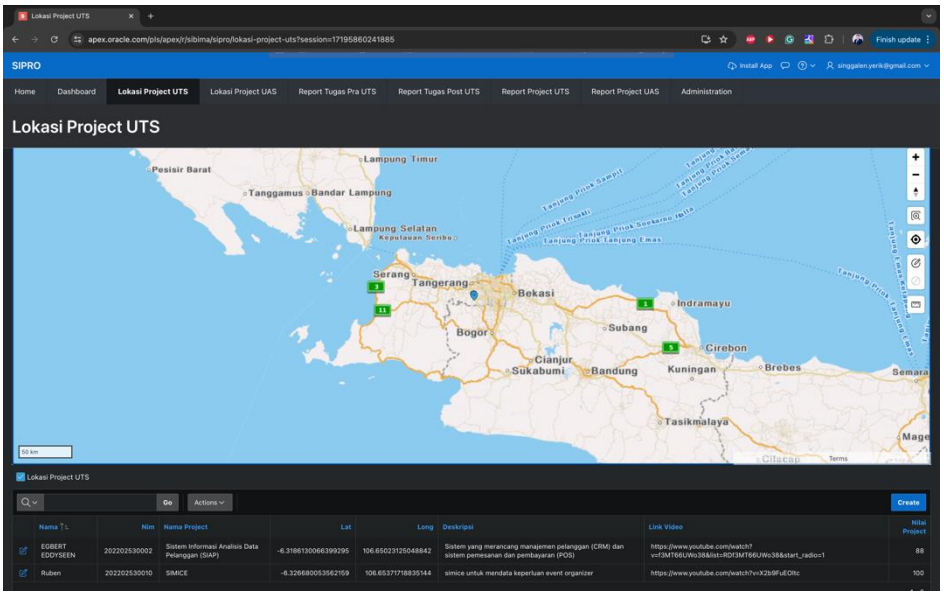

Figure 7. User Interface for Project Location

Figure 7 shows the interface of the project location. The application interface that integrates project locations facilitates lecturers, as users, in identifying and analyzing the distribution of student projects to ensure they are evenly spread and aligned with regional issues. This capability allows for a comprehensive visual representation of each project's location, making pinpointing areas requiring additional attention or resources easier. Furthermore, this spatial analysis helps understand the correlation between project themes and local challenges, enhancing the relevance and impact of student work. Ultimately, such an interface significantly improves project management, assessment efficiency, and effectiveness.

Furthermore, integrating maps within the student assignment and project database can be a reference for initiating grant programs or funding aligned with the Sustainable Development Goals and the Medium-Term Village Development Plan (RPJMDes) in remote, frontier, and underdeveloped areas (3T). This geographic data enables the identification of critical areas that would benefit from targeted interventions and support. Additionally,

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it ensures that the projects and initiatives are contextually relevant and strategically located to address specific regional needs. This approach promotes sustainable development and enhances the efficacy of development programs in achieving long-term goals. Leveraging such integrated data systems fosters more informed and impactful decision-making processes.

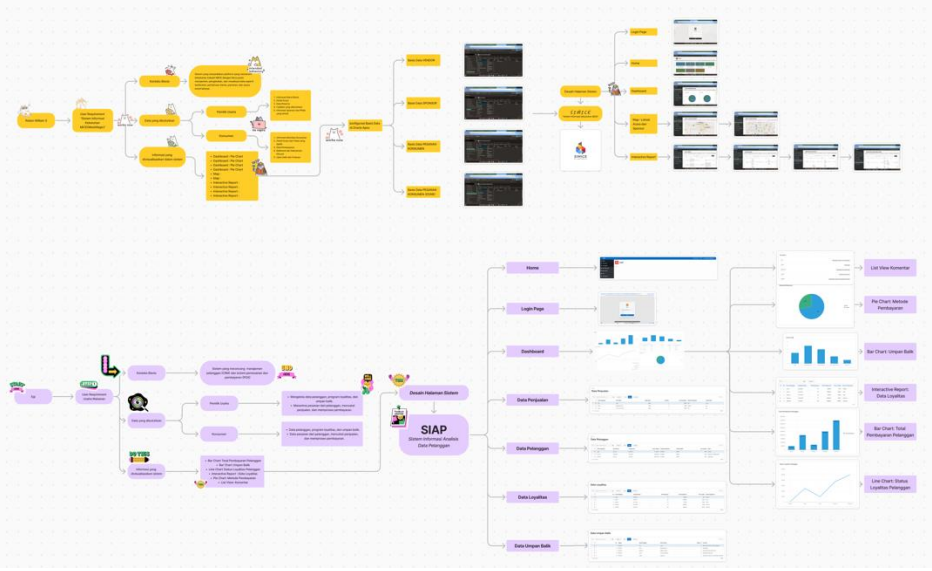

Figure 8. Project Monitoring Process

Figure 8 shows the student project monitoring using the Figjam board. The student project monitoring process is conducted using the Figjam board by identifying the processes and design stages according to each user's needs. Initially, the Figjam board facilitates a visual and collaborative approach to effectively tracking project progress and milestones. This tool allows for a clear delineation of each phase, ensuring that all necessary steps are completed in alignment with user-specific requirements. Moreover, the visual nature of the Figjam board aids in promptly addressing any discrepancies or adjustments needed during the project lifecycle. Ultimately, this method ensures a systematic, efficient, and user-centered monitoring process, enhancing overall project management and outcomes.

Utilizing digital technology as a medium for project-based learning enhances student creativity in the project design initiation process. Initially, digital tools provide diverse resources and platforms that foster innovative thinking and problem-solving skills. Additionally, these technologies' interactive and dynamic nature encourages students to experiment with new ideas and methodologies, enriching their learning experience. By integrating these technologies into the educational framework, students are better equipped to develop original and compelling project designs. Ultimately, this approach nurtures creativity and prepares students for the demands of the modern, technology-driven professional environment.

3.2 Optimizing Digital Technology in Project-based Learning

The digital transformation era has revolutionized academia, with advancements in AI technology during the big-data era prompting the education sector to transform teaching and learning practices. Initially, AI technologies offer innovative tools for personalized learning experiences, adapting educational content to meet individual student needs [28]. Furthermore, big data analytics provides educators with deep insights into student performance and learning patterns, enabling more informed decision-making [29]. This convergence of AI and big data enhances educational strategies' effectiveness and prepares students for a rapidly evolving digital world. Ultimately, digital transformation in education fosters a more adaptive, efficient, and future-ready learning environment.

Academics are striving to enhance their capacity and skills in technology to adapt to the latest technological advancements, one approach being the adoption of project-based learning and its integration into coursework. Initially, this drive for upskilling ensures educators remain relevant and effective in a rapidly changing technological landscape [30]–[32]. Furthermore, integrating project-based learning into the curriculum allows for a more hands-on and practical approach to education, aligning theoretical knowledge with real-world applications [33], [34]. This proactive adaptation enriches students' learning experience and positions academic institutions at the forefront of educational innovation [35]–[37]. Ultimately, embracing these advancements fosters a dynamic and future-ready educational environment.

Project-based learning is a solution-oriented approach that enhances creativity while transforming theoretical concepts into practical applications that directly address stakeholders' problems. Initially, this method engages students in real-world challenges, fostering a deeper understanding of the subject matter and encouraging

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innovative thinking [38]–[40]. Additionally, by working on tangible projects, students develop critical problem-solving skills and the ability to apply their knowledge in meaningful ways [41]–[43]. This educational strategy nurtures creative potential and ensures that theoretical insights are effectively translated into practical solutions [44], [45]. Ultimately, project-based learning bridges the gap between theory and practice, making it a highly effective tool for contemporary education.

In support of the MBKM program, the project-based learning approach becomes increasingly relevant as it integrates the learning and assessment processes with student activities. Initially, this method aligns educational objectives with practical student engagements, ensuring learning outcomes are directly linked to real-world applications [46]–[48]. Additionally, embedding assessment within the project execution provides continuous feedback and evaluation, enhancing the educational experience [49], [50]. This integration fosters a deeper understanding of the material and encourages active participation and critical thinking among students [51], [52]. Ultimately, project-based learning effectively bridges the gap between academic theory and practical application, making it an essential strategy for contemporary education aligned with MBKM objectives.

4. CONCLUSION

The conclusion of this study highlights the significant benefits of incorporating Rapid and Participatory Application Development in enhancing the educational process. The approach ensures the final application is functional and user-centric by leveraging iterative development and active user involvement. This methodology aligns closely with the needs of modern education, particularly in project-based learning environments. It facilitates timely feedback, continuous improvement, and effective integration of digital tools, thereby enriching the overall learning experience. Consequently, adopting such innovative frameworks drives substantial improvements in teaching methodologies and student engagement, positioning academic institutions to better meet contemporary education's challenges.

ACKNOWLEDGMENT

I want to express my sincere gratitude to the Tourism Department, Faculty of Business Administration and Communication, Atma Jaya Catholic University of Indonesia, PUSDIPAR, and the LPPM (Lembaga Penelitian dan Pengabdian kepada Masyarakat) for the support in the publication of this research.

REFERENCES

[1] B. Vidal et al., “Students’ perception on learning methods in engineering disciplines,” J. Appl. Res. High. Educ., vol. 14, no. 3, pp. 946–957, Jan. 2022, doi: 10.1108/JARHE-01-2021-0041.
[2] C. Saikaew, “How to motivate students to do a course project in design of experiments course from a web-based virtual learning material?,” Int. J. Lean Six Sigma, vol. 13, no. 5, pp. 1079–1103, Jan. 2022, doi: 10.1108/IJLSS-02-2021-0031.
[3] R. Belwal, S. Belwal, A. B. Sufian, and A. Al Badi, “Project-based learning (PBL): outcomes of students’ engagement in an external consultancy project in Oman,” Educ. Train., vol. 63, no. 3, pp. 336–359, Jan. 2020, doi: 10.1108/ET-01-2020-0006.
[4] T. Konrad, A. Wiek, and M. Barth, “Embracing conflicts for interpersonal competence development in project-based sustainability courses,” Int. J. Sustain. High. Educ., vol. 21, no. 1, pp. 76–96, Jan. 2020, doi: 10.1108/IJSHE-06-2019-0190.
[5] T. Konrad, A. Wiek, and M. Barth, “Learning processes for interpersonal competence development in project-based sustainability courses – insights from a comparative international study,” Int. J. Sustain. High. Educ., vol. 22, no. 3, pp. 535–560, Jan. 2021, doi: 10.1108/IJSHE-07-2020-0231.
[6] J. Winborg and G. Hägg, “The role of work-integrated learning in preparing students for a corporate entrepreneurial career,” Educ. Train., vol. 65, no. 4, pp. 674–696, Jan. 2023, doi: 10.1108/ET-05-2021-0196.
[7] J. Birdman, A. Wiek, and D. J. Lang, “Developing key competencies in sustainability through project-based learning in graduate sustainability programs,” Int. J. Sustain. High. Educ., vol. 23, no. 5, pp. 1139–1157, Jan. 2022, doi: 10.1108/IJSHE-12-2020-0506.
[8] A. Karahasanović and A. L. Culén, “Project-based learning in human–computer interaction: a service-dominant logic approach,” Interact. Technol. Smart Educ., vol. 20, no. 1, pp. 122–141, Jan. 2023, doi: 10.1108/ITSE-10-2021-0178.
[9] N. Sumanarathna, B. Duodu, and S. Rowlinson, “Social capital, exploratory learning and exploitative learning in project-based firms: the mediating effect of collaborative environment,” Learn. Organ., vol. 27, no. 4, pp. 351–364, Jan. 2020, doi: 10.1108/TLO-03-2020-0033.
[10] C. E. Kampf, C. J. Brandt, and C. G. Kampf, “Using action research in innovation project management: building legitimacy and organizational learning in an SME during a merger process,” Int. J. Manag. Proj. Bus., vol. 16, no. 1, pp. 92–118, Jan. 2023, doi: 10.1108/IJMPB-02-2020-0044.
[11] F. Crespin-Mazet, K. Goglio-Primard, M. I. Havenvid, and Å. Linné, “The diffusion of innovation in project-based firms – linking the temporary and permanent levels of organisation,” J. Bus. Ind. Mark., vol. 36, no. 9, pp. 1692–1705, Jan. 2021, doi: 10.1108/JBIM-01-2020-0066.
[12] R. Iftikhar, M. Majeed, and N. Drouin, “Crisis management process for project-based organizations,” Int. J. Manag. Proj. Bus., vol. 16, no. 8, pp. 100–125, Jan. 2023, doi: 10.1108/IJMPB-10-2020-0306.
[13] G. Pan, P. S. Seow, V. Shankararaman, and K. Koh, “An exploration into key roles in making project-based learning

Journal of Information System Research (JOSH)
Volume 5, No. 4, Juli 2024, pp 1425−1435
ISSN 2686-228X (media online)
https://ejurnal.seminar-id.com/index.php/josh/
DOI 10.47065/josh.v5i4.5505

happen: Insights from a case study of a university," J. Int. Educ. Bus., vol. 14, no. 1, pp. 109–129, Jan. 2020, doi: 10.1108/JIEB-02-2020-0018.
[14] H. (Cynthia) Hou, J. H. K. Lai, and H. Wu, "Project-based learning and pedagogies for virtual reality-aided green building education: case study on a university course," Int. J. Sustain. High. Educ., vol. 24, no. 6, pp. 1308–1327, Jan. 2023, doi: 10.1108/IJSHE-06-2022-0197.
[15] T. T. Ngo and B. Chase, "Students' attitude toward sustainability and humanitarian engineering education using project-based and international field learning pedagogies," Int. J. Sustain. High. Educ., vol. 22, no. 1, pp. 254–273, Jan. 2021, doi: 10.1108/IJSHE-06-2020-0214.
[16] D. Rieg, M. L. Maclennan, F. Scramim, M. Huertas, and E. Augusto, "Project-based learning through the lens of SEEM: enhancing implementation in the Brazilian context," J. Int. Educ. Bus., vol. 17, no. 2, pp. 210–227, Jan. 2024, doi: 10.1108/JIEB-06-2023-0039.
[17] C. Qi, M. Y. Lai, L. Liu, S. Zuo, H. Liang, and R. Li, "Examining teachers' learning through a project-based learning lesson study: a case study in China," Int. J. Lesson Learn. Stud., vol. 12, no. 1, pp. 106–119, Jan. 2023, doi: 10.1108/IJLLS-09-2022-0127.
[18] G. Pan, P. S. Seow, V. Shankararaman, and K. Koh, "Essence of partnership management in project-based learning: insights from a university's global project programme," J. Int. Educ. Bus., vol. 14, no. 2, pp. 297–319, Jan. 2020, doi: 10.1108/JIEB-04-2020-0031.
[19] Sahidi and Z. Mutaqin, "Sistem Informasi Pariwisata Desa Senaru Berbasis Website Menggunakan Metode RAD," J. Comtechno Comput. Technol., vol. 1, no. 1, pp. 1–5, 2023.
[20] G. Laptev and D. Shaytan, "Co-design-based learning for entrepreneurs in the digital age," Meas. Bus. Excell., vol. 26, no. 1, pp. 93–105, Jan. 2022, doi: 10.1108/MBE-11-2020-0158.
[21] "Improving project-to-organization learning: A suggested framework," Dev. Learn. Organ., vol. 36, no. 1, pp. 33–35, Jan. 2021, doi: 10.1108/DLO-03-2021-0038.
[22] D. B. Chiponde, B. Gledson, and D. Greenwood, "Organisational learning from failure and the needs-based hierarchy of project-based organisations," Front. Eng. Built Environ., vol. 2, no. 2, pp. 121–132, Jan. 2022, doi: 10.1108/febe-10-2021-0051.
[23] "Proactive skills in project-based learning: A focus on construction 4.0 and postgraduate study," Dev. Learn. Organ., vol. 37, no. 3, pp. 39–40, Jan. 2023, doi: 10.1108/DLO-02-2023-0051.
[24] G. H. Sagala and T. Effiyanti, "SMEs project: a method to encourage interpersonal skills among pre-service accountant," J. Appl. Res. High. Educ., vol. 12, no. 5, pp. 883–895, Jan. 2020, doi: 10.1108/JARHE-04-2019-0097.
[25] D. L. Rieg, R. M. M. Lima, D. Mesquita, F. C. L. Scramim, and O. Mattasoglio Neto, "Active learning strategies to develop research competences in engineering education," J. Appl. Res. High. Educ., vol. 14, no. 3, pp. 1210–1223, Jan. 2022, doi: 10.1108/JARHE-01-2021-0038.
[26] G. K. Kundu and S. K. Perwez, "ISM-MICMAC approach for analysis of project-based learning barriers," J. Int. Educ. Bus., vol. 15, no. 1, pp. 9–31, Jan. 2022, doi: 10.1108/JIEB-02-2021-0025.
[27] K. Trepper, A. Boardman, and A. Garcia, "Shifting pedagogy, shifting practice: teachers' perceptions of project-based learning in English language arts," English Teach., vol. 21, no. 4, pp. 469–482, Jan. 2022, doi: 10.1108/ETPC-12-2021-0150.
[28] W. Ladeira, M. G. Perin, and F. Santini, "Acceptance of service robots: a meta-analysis in the hospitality and tourism industry," J. Hosp. Mark. Manag., vol. 32, no. 6, pp. 694–716, 2023, doi: 10.1080/19368623.2023.2202168.
[29] K. Sharma, M. Jain, and S. Dhir, "Analysing the impact of artificial intelligence on the competitiveness of tourism firms: a modified total interpretive structural modeling (m-TISM) approach," Int. J. Emerg. Mark., vol. 17, no. 4, pp. 1067–1084, Jan. 2022, doi: 10.1108/IJOEM-05-2021-0810.
[30] P. M. I. Nottingham, "Professional artefacts: evaluating creative outcomes for work-based inquiry," J. Work. Manag., vol. 12, no. 2, pp. 127–139, Jan. 2020, doi: 10.1108/JWAM-03-2020-0014.
[31] P. A. Müller, T. Bäumer, J. Silberer, and S. Zimmermann, "Using research methods courses to teach students about sustainable development – a three-phase model for a transformative learning experience," Int. J. Sustain. High. Educ., vol. 21, no. 3, pp. 427–439, Jan. 2020, doi: 10.1108/IJSHE-08-2019-0252.
[32] B. N. Pasi, P. V. Dongare, and S. J. Rawat, "Prioritization of risks associated with the implementation of project-based learning concept in engineering institutions," High. Educ. Ski. Work. Learn., vol. 12, no. 6, pp. 1070–1083, Jan. 2022, doi: 10.1108/HESWBL-05-2022-0117.
[33] G. Miao, I. Ranaraja, S. Grundy, N. Brown, M. Belkina, and T. Goldfinch, "Project-based learning in Australian & New Zealand universities: sustainability and scalability," Australas. J. Eng. Educ., vol. 00, no. 00, pp. 1–11, 2024, doi: 10.1080/22054952.2024.2358585.
[34] K. J. Kim, "Project-based learning approach to increase medical student empathy," Med. Educ. Online, vol. 25, no. 1, 2020, doi: 10.1080/10872981.2020.1742965.
[35] N. Thi Ngoc Ha, "Implementation of on-campus work-integrated learning activities in Vietnamese universities: 'don't rely on lecturers,'" J. Furth. High. Educ., vol. 47, no. 8, pp. 1124–1139, 2023, doi: 10.1080/0309877X.2023.2217648.
[36] J. Doyle et al., "Transforming young adults' climate learning and actions through a co-created climate communication retreat," Environ. Educ. Res., vol. 0, no. 0, pp. 1–19, 2024, doi: 10.1080/13504622.2024.2348693.
[37] A. Kolmos, J. E. Holgaard, and N. R. Clausen, "Progression of student self-assessed learning outcomes in systemic PBL," Eur. J. Eng. Educ., pp. 1–23, 2020, doi: 10.1080/03043797.2020.1789070.
[38] S. O'Connor, J. Power, N. Blom, and D. Tanner, "Engineering students' perceptions of problem and project-based learning (PBL) in an online learning environment," Australas. J. Eng. Educ., vol. 00, no. 00, pp. 1–14, 2024, doi: 10.1080/22054952.2024.2357404.
[39] A. Shekh-Abed, "Metacognitive self-knowledge and cognitive skills in project-based learning of high school electronics students," Eur. J. Eng. Educ., pp. 1–16, 2024, doi: 10.1080/03043797.2024.2374479.
[40] J. Neves, "Project-based learning for the development of social transformative competence in socially engaged translators," Interpret. Transl. Train., vol. 16, no. 4, pp. 465–483, 2022, doi: 10.1080/1750399X.2022.2084258.

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ISSN 2686-228X (media online)
https://ejurnal.seminar-id.com/index.php/josh/
DOI 10.47065/josh.v5i4.5505

[41] E. C. Miller, S. Severance, and J. Krajcik, "Motivating Teaching, Sustaining Change in Practice: Design Principles for Teacher Learning in Project-Based Learning Contexts," J. Sci. Teacher Educ., vol. 32, no. 7, pp. 757–779, 2021, doi: 10.1080/1046560X.2020.1864099.
[42] U. Uotila, K. Keskiniva, J. M. Junnonen, and A. Saari, "Developing engineering students' generic and professional skills through a consultative approach to project-based learning," Eur. J. Eng. Educ., vol. 49, no. 4, pp. 667–682, 2023, doi: 10.1080/03043797.2023.2286329.
[43] E. C. Miller, E. Reigh, L. Berland, and J. Krajcik, "Supporting Equity in Virtual Science Instruction Through Project-Based Learning: Opportunities and Challenges in the Era of COVID-19," J. Sci. Teacher Educ., vol. 32, no. 6, pp. 642–663, 2021, doi: 10.1080/1046560X.2021.1873549.
[44] A. Kolmos, J. E. Holgaard, H. W. Routhe, M. Winther, and L. Bertel, "Interdisciplinary project types in engineering education," Eur. J. Eng. Educ., vol. 49, no. 2, pp. 257–282, 2024, doi: 10.1080/03043797.2023.2267476.
[45] K. Resch, I. Schrittesser, and M. Knapp, "Overcoming the theory-practice divide in teacher education with the 'Partner School Programme'. A conceptual mapping," Eur. J. Teach. Educ., vol. 47, no. 3, pp. 564–580, 2024, doi: 10.1080/02619768.2022.2058928.
[46] W. Awamleh, "The effectiveness of e-project-based learning in improving the academic achievement and motivation of special education female students," Cogent Educ., vol. 11, no. 1, p., 2024, doi: 10.1080/2331186X.2024.2369968.
[47] K. Juuti, J. Lavonen, V. Salonen, K. Salmela-Aro, B. Schneider, and J. Krajcik, "A Teacher–Researcher Partnership for Professional Learning: Co-Designing Project-Based Learning Units to Increase Student Engagement in Science Classes," J. Sci. Teacher Educ., vol. 32, no. 6, pp. 625–641, 2021, doi: 10.1080/1046560X.2021.1872207.
[48] F. A. A. Elkhamisy, A. H. Zidan, and M. F. Fathelbab, "Using project-based learning to enhance curricular integration and relevance of basic medical sciences in pre-clerkship years," Alexandria J. Med., vol. 58, no. 1, pp. 1–7, 2022, doi: 10.1080/20905068.2021.2009652.
[49] L. Lavonen, A. Loukomies, J. Vartiainen, and P. Palojoki, "Supporting Pupils' scientific and engineering practices in everyday life contexts at the primary school level during a project-based learning unit in Finland," Educ. 3-13, vol. 50, no. 7, pp. 918–933, 2022, doi: 10.1080/03004279.2021.1921823.
[50] W. Huang, J. S. London, and L. A. Perry, "Project-Based Learning Promotes Students' Perceived Relevance in an Engineering Statistics Course: A Comparison of Learning in Synchronous and Online Learning Environments," J. Stat. Data Sci. Educ., vol. 31, no. 2, pp. 179–187, 2023, doi: 10.1080/26939169.2022.2128119.
[51] J. St. John, K. St. John, and C. St. John, "Learning by facilitating: A project-based interdisciplinary approach," J. Educ. Bus., vol. 98, no. 7, pp. 404–411, 2023, doi: 10.1080/08832323.2023.2196049.
[52] M. J. Hogan et al., "Education for collective intelligence," Irish Educ. Stud., pp. 1–30, 2023, doi: 10.1080/03323315.2023.2250309.