

The Role of Principals in Improving Teachers' Pedagogic Competence through Continuous Professional Development Programs

Muhammad Mamduh Nuruddin, Pamulang University, Indonesia

Taufik, UIN Syarif Hidayatullah Jakarta, Indonesia

Muchammad Ibnu Muzakir, Darunnajah Univesity, Indonesia

Mukhlisin, STAI Al-Amin Dompu, Indonesia

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Abstract

This study aims to analyze the application of school principals' policies in improving the pedagogic competence of teachers in Darunnajah Islamic Boarding School. The research method used is qualitative with a case study approach, which collects data through in-depth interviews with principals, vice principals, and teachers, as well as observation of policy planning and evaluation activities. The data obtained were analyzed using thematic analysis techniques to identify key themes related to policy planning, evaluation, and collaboration in improving pedagogic competence. The results of the study show that the policies implemented by the principal at the Darunnajah Islamic Boarding School focus on structured planning, continuous evaluation, and collaboration with teachers. Systematic planning and regular evaluation have been proven to increase teaching effectiveness. In addition, collaboration between school principals and teachers in designing education policies also strengthens the implementation of policies that are relevant to educational needs. Nonetheless, challenges in implementation such as resistance to change and resource limitations remain obstacles. This research contributes to understanding the importance of inclusive and continuous evaluation-based education policies to improve the pedagogic competence of teachers in Islamic boarding schools.

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A. Introduction

The role of school principals in improving teachers' pedagogic competence is essential to achieve optimal educational goals. In the world of education that continues to develop, school principals are expected not only to carry out administrative functions but also to play an active role in developing the pedagogic capacity of teachers. This challenge is even more significant with the demand to always update teaching methods that are relevant to the development of the times and technology (Siagian et al., 2025). Therefore, school principals need to implement various strategies that support the improvement of the quality of learning through continuous professional development for teachers (Leiva et al., 2016).

Continuous professional development programs are one of the effective approaches to improve teachers' pedagogic competence. The program includes a variety of activities such as training, seminars, and teacher working groups that allow them to continuously hone their teaching skills as

well as update their knowledge. Research by Wulandari & Arifin (2020) shows that the involvement of principals in continuous training programs can improve teachers' skills in managing classes and delivering materials. This is important so that teachers can face increasingly complex and diverse educational challenges.

However, although principals play a key role in teacher professional development, a number of studies reveal significant gaps in the implementation of teacher pedagogic competency development. One of the problems that is often found is the limited time of the principal to provide adequate supervision to all teachers, given that they have many other administrative tasks (Abbaspour et al., 2024). Some principals struggle to provide feedback directly to teachers, which has an impact on the low effectiveness of pedagogic competency development (McMahon & Torrance, 2023). Therefore, it is important to design a managerial system that supports task delegation so that school principals can focus more on teacher competency development efforts.

Another gap found is the lack of a conducive environment in many schools to support the professional development of teachers. Although principals play a role in creating a school culture that supports collaboration between teachers, not all schools have sufficient resources to provide the facilities or time needed for sustainable development (Almeida et al., 2018). In some schools, this lack of resources hinders the success of professional development programs. Principals need to create an atmosphere that encourages teachers to actively engage in professional training programs and discussions, as well as ensure that existing resources are used to the fullest extent for those purposes.

In addition, another challenge that school principals often face is supporting new teachers who join the school. Principals play a very important role in helping new teachers adapt and develop their pedagogical competence. However, research shows that many principals do not provide adequate support for new teachers through effective mentoring and peer observation programs (Chew & Andrews, 2010). As a result, new teachers may struggle to develop their teaching skills and integrate into the school culture.

The importance of developing teachers' pedagogic competencies through this continuous professional development program is in line with the view that the quality of education is greatly influenced by the quality of teachers. Therefore, efforts to improve teachers' pedagogic skills are urgently needed, and principals should play a greater role in designing and implementing appropriate training programs (Koutselini, 2015). In this context, principals need to balance their managerial roles with the development of pedagogical leadership that allows teachers to develop professionally.

However, existing research shows that although principals have implemented several strategies to improve teachers' pedagogic competence, there are still many obstacles to effective implementation in the field, such as limited time, resources, and support for new teachers. This research gap shows that despite many initiatives, the effectiveness of professional development programs is often hampered by external factors that cannot always be easily addressed. Therefore, it is important to identify the factors that affect the effectiveness of the principal in improving the pedagogic competence of teachers, as well as to look for practical solutions that can be applied to address the problem.

Thus, this article aims to delve deeper into the role of school principals in improving teachers' pedagogic competence through continuous professional development programs. In this study, various strategies that can be implemented by school principals to optimize the potential of teachers, as well as the challenges faced in the current educational context, will be discussed, with the aim of providing recommendations that can reduce the gap that exists in the development of teachers' pedagogic competencies.

B. Methods

This study uses a qualitative descriptive approach that aims to describe and analyze the principal's policy in improving the pedagogic competence of teachers at the Darunnajah Islamic Boarding School. The research was carried out at the Darunnajah Islamic Boarding School located in Pamulang, Banten, with a implementation time from March to June 2023. The data sources in this study are divided into two types, namely primary data and secondary data. Primary data was obtained through data collection techniques in the form of in-depth interviews and participatory observations with key informants, which included school principals, vice principals, and teachers. The interviews were conducted to explore information related to the policies implemented by school principals in improving teachers' pedagogic competence and the challenges faced in their implementation. Secondary data was obtained from school documents, such as madrasah profiles, vision and mission, organizational structure, and information related to teacher training and professional development programs at Darunnajah Islamic Boarding School.

The data collection techniques used include interviews, documentation, and observations. The interview was conducted using pre-prepared interview guidelines, which included questions related to the principal's policies and the development of teachers' pedagogic competencies. Documentation refers to a variety of documents related to teacher professional development policies and relevant school data. Observations are carried out directly in the field to observe the interaction between the principal and teachers, as well as the implementation of the training programs provided.

Data analysis is carried out by following systematic steps, which begin with data reduction, data presentation, and verification. Data reduction is carried out by filtering relevant information from interviews, observations, and documentation to get a clear picture of the principal's policies in improving teachers' pedagogic competence. Data presentation is carried out using data representation techniques through tables and graphs to facilitate understanding of research findings. Data verification is carried out using source triangulation, which involves cross-checking data between the results of interviews with principals, teachers, and vice principals to ensure consistency and validity of the data. In addition, the triangulation method is carried out by comparing data obtained from interviews and relevant documents to ensure the validity of the information obtained.

The conclusion was drawn after the data was analyzed in depth, which resulted in an understanding of the principal's policy in improving the pedagogic competence of teachers at the Darunnajah Islamic Boarding School. The validity of the data is maintained through triangulation involving various sources and methods, to ensure the accuracy and reliability of the research results. This approach is expected to contribute to a better understanding of the principal's policy in managing and improving the pedagogic competence of teachers in the pesantren education environment.

C. Result and Discussion

Policy Planning of School Principals in Improving Teachers' Pedagogic Competence

The policy planning of school principals in improving the pedagogic competence of teachers at the Darunnajah Islamic Boarding School shows the importance of structured and participatory steps in an effort to improve the quality of education. Abdul Aziz, as the principal, emphasized the importance of careful learning preparation, clear learning directions, and a systematic work plan to ensure discipline and accuracy in the teaching and learning process. This is in line with research conducted by Wulandari and Arifin (2020), which states that teachers' pedagogic competence can be improved through structured planning and support from school principals' policies in developing appropriate teaching strategies. In this case, the principal focuses on the comprehensive planning stage

to build a strong foundation in the educational process, which can affect the quality of teaching and learning that takes place in the classroom.

However, the perspective of Ahmad Faiz, Vice Principal for Student Affairs, brings a broader dimension regarding the importance of policy evaluation in the planning process. He revealed that the policies implemented by school principals need to be evaluated periodically to assess their effectiveness. Ahmad Faiz emphasized that although the policies implemented have a positive impact, there are often aspects that need to be improved to be more relevant to the needs of the times and changes in dynamics in the world of education. This evaluation is important to ensure that existing policies can adapt to the latest developments and are able to provide maximum results for teachers' pedagogic competence (Attsaury, Hadiyanto, Supian, & Munaddhomah, 2024). Regular evaluations also allow for policy improvements that can optimize teacher performance and improve the quality of education as a whole.

The view of Wiwik Indarish, Deputy Principal for Curriculum, provides an additional perspective that is no less important, namely regarding collaboration and participation of teachers in policy planning. According to him, the success of the policy is highly dependent on the involvement of teachers in providing constructive input and suggestions. Wiwik proposed that in the planning process, school principals should open up more space for teachers to be directly involved in the policy-making process. This aims to make the resulting policies more in line with the real needs in the field, while ensuring that the policies implemented can be well accepted by all relevant parties (Chew & Andrews, 2010). This collaboration, according to research by Bolívar (2010), shows that the involvement of various parties in education policy decision-making is essential to ensure its successful implementation.

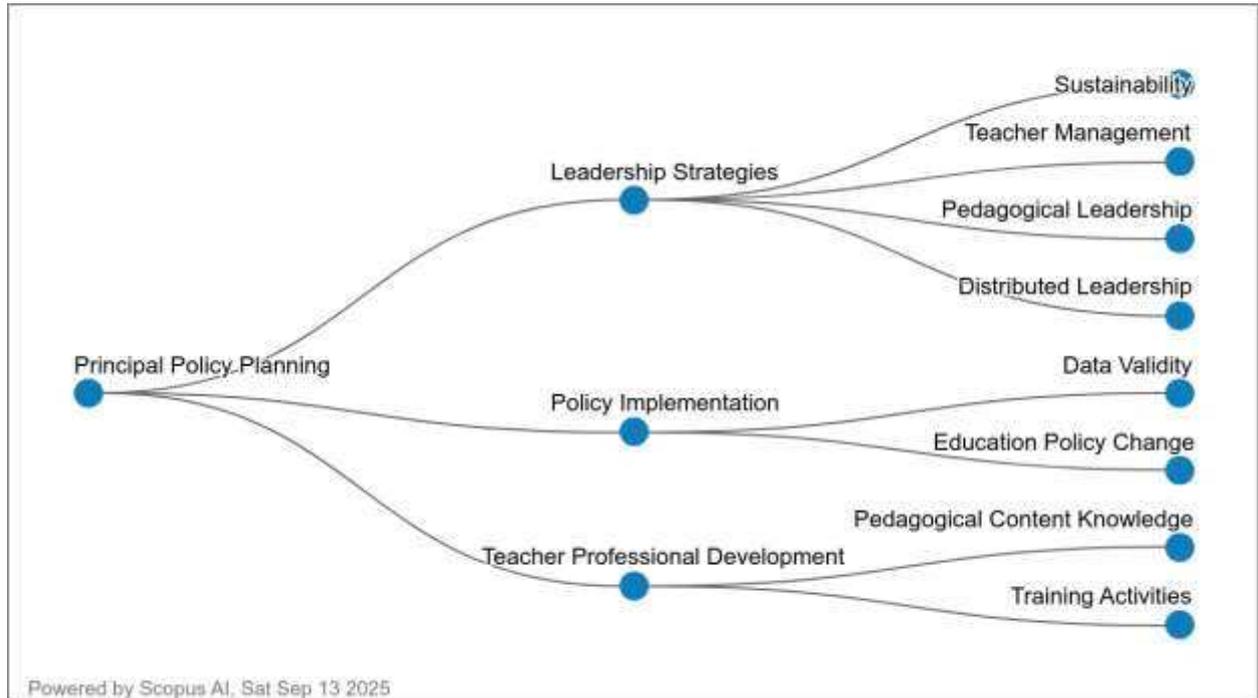
Findings in the field show that there are differences of views among policymakers on the steps that need to be taken in policy planning to improve teachers' pedagogic competence. Abdul Aziz emphasized more on structured planning as an important first step for the development of teacher competence. However, Ahmad Faiz and Wiwik Indarish's views show the importance of emphasis on continuous evaluation and collaboration in every stage of planning. This illustrates that policy planning cannot be seen only as an initial stage, but must involve an ongoing process that supports continuous quality improvement (Llorent-Bedmar, Navarro-Granados, & Cobano-Delgado Palma, 2021). This approach is very relevant in creating policies that are adaptive and responsive to changing dynamic educational needs.

Thus, the policy planning carried out at the Darunnajah Islamic Boarding School leads more towards a holistic approach, which not only focuses on initial development but also pays attention to evaluation and improvement. This process creates a cycle that allows the policies implemented to be more responsive to changes and the needs of teachers in the field. This approach is important to ensure that the resulting policies are not only efficient but also effective in improving teachers' pedagogic competence in an ongoing manner. Yalçın, Uslukaya, and Demirdis (2025) suggest that holistic education policies need to be supported by a leadership approach that is able to encourage pedagogical development through collaboration and comprehensive skills development.

Therefore, policy planning that focuses on collaboration, evaluation, and continuous improvement is a particularly relevant step in the ever-evolving context of education. By combining various views from the principal, vice principal for student affairs, and vice principal for curriculum, policy planning at the Darunnajah Islamic Boarding School has the potential to have a positive impact on improving teachers' pedagogic competence. Therefore, it is important for school principals to integrate the evaluation and active participation of teachers in each stage of planning so that the

resulting policies can be more effective and in accordance with the demands of current educational needs. The explanation can be seen in the picture below:

Figure 1.1



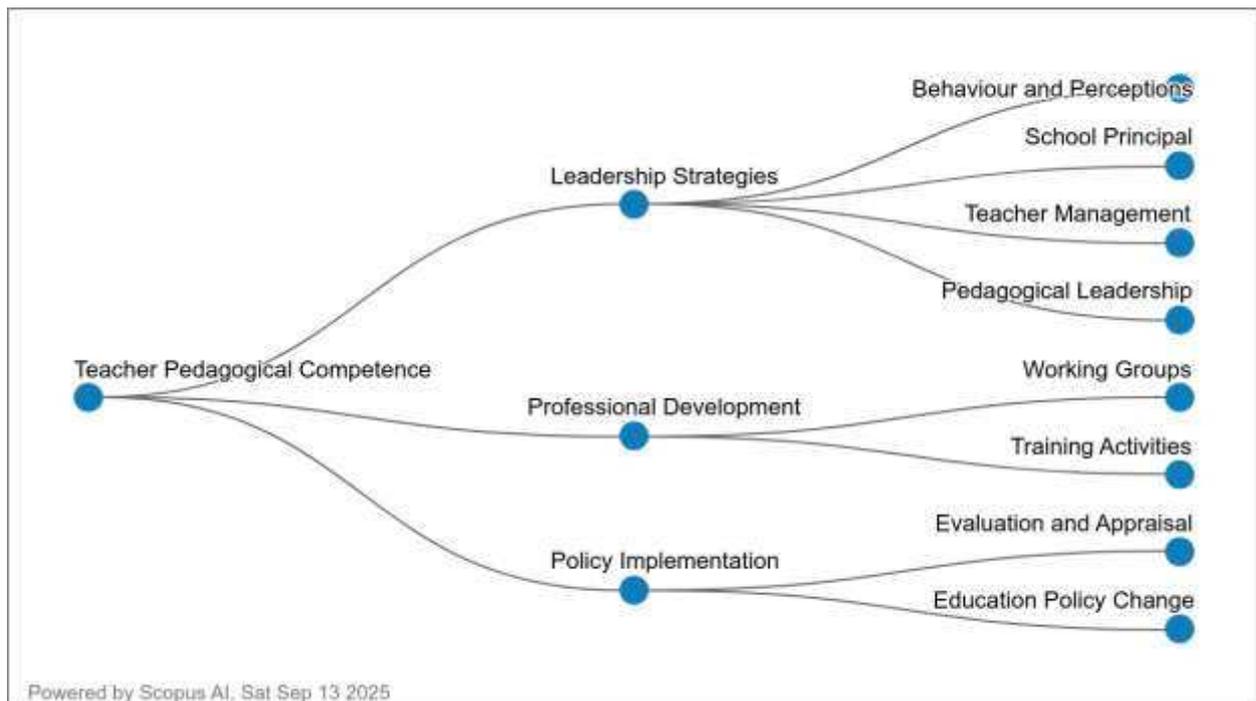
The Implementation of School Principals' Policies in Improving Teachers' Pedagogic Competence

The implementation of school principals' policies in improving teachers' pedagogic competence is greatly influenced by the strategies implemented by school principals in managing policies in schools. As explained by Wulandari, Arifin, and Zahrini (2020), good policy from school principals involves developing a clear vision, mission, and goals to advance the quality of education. In addition, teachers' pedagogic competence can be improved through timing, the use of technology, and dress discipline that can support learning success (Azainil, Komariyah, & Yan, 2021).

It is important for principals to support the development of teacher professionalism through training that is relevant to pedagogic needs (Liu & Zhang, 2024). Through strategies such as seminars and teacher working groups, school principals can help improve teachers' pedagogic competence to be more effective in carrying out learning. For example, principals can create a positive school climate by providing psychological and professional support to teachers, which greatly supports the creation of an environment conducive to the development of teachers' pedagogic competencies (Simon, Heck, Christie, & Farragher, 2021).

Principals also need to show commitment by setting a direct example through tangible actions. These actions play an important role in creating high motivation for teachers to actively participate in policies implemented in schools (Ozdogru, Tulubas, Karakose, & Papadakis, 2025). In addition, the development of a curriculum that suits the needs of students and a good understanding of learning theory is also an important aspect in improving teachers' pedagogic competence (Fernandez, 2005). However, even though the principal's policy in improving pedagogic competence has been widely implemented, there are still some obstacles in its implementation. Some teachers often face difficulties in understanding and implementing new teaching methods. This, according to Zahraini and Situmorang (2020), can be caused by resistance to changes that have become habits in teaching practice, which requires a more in-depth and gradual approach.

Figure 1.2



Support and Evaluation of School Principals' Policies in Improving Teachers' Pedagogic Competence

Policy support for school principals in improving the pedagogic competence of teachers at the Darunnajah Islamic Boarding School is very important to ensure good learning quality. The head of the pesantren has a very strategic role in providing facilities that support the success of learning. As explained by Wulandari, Arifin, and Zahraini (2020), the head of the pesantren who actively facilitates training will help significantly improve the pedagogic competence of teachers. In addition, the head of the pesantren is also responsible for supporting teachers' participation in various relevant seminars and trainings, which can renew their understanding of effective teaching techniques (Atstsaury, Hadiyanto, Supian, & Munaddhomah, 2024).

Evaluation of the policy of the head of the pesantren is also very necessary to ensure that the policies implemented run well and have a positive impact on improving teachers' pedagogic competence. For example, at the Darunnajah Islamic Boarding School, the head of the pesantren routinely conducts evaluations of learning preparations carried out by teachers, such as lesson plans and syllabi. In this case, the head of the pesantren provides constructive feedback to improve the teaching methods applied by the teacher (Leiva, Montecinos, Aravena, 2016). This evaluation not only measures the success of teaching but also provides an opportunity for teachers to correct shortcomings and develop themselves further.

In addition, to strengthen the policies implemented, the head of the pesantren needs to hold additional training, such as In-House Training (IHT), which serves to strengthen the commitment of all pesantren residents in improving the quality of teaching. This is especially important because this kind of training can provide an opportunity for pesantren principals to direct and motivate teachers directly in improving their pedagogic competence (Arriagada-Hernández, Venegas-Perez, Pérez, & Tomckowiack, 2024). Periodic evaluations, such as weekly, can also provide space for teachers to reflect on their teaching and receive feedback for further professional development.

Although training and evaluation are two main aspects that are important in supporting the development of teachers' pedagogic competence, the head of the pesantren also needs to provide descriptive and constructive feedback. This approach will help teachers to be more reflective of their teaching practices (Ozdogru, Tulubas, Karakose, & Papadakis, 2025). The head of the pesantren is also expected to create a positive pesantren climate that supports the professional development of teachers, as explained by Macleod (2020), who emphasizes the importance of a supportive environment for the development of educator professionalism.

The leadership of the head of the pesantren, based on the principles of instructional and transformational leadership, is also a key factor in improving the pedagogic competence of teachers. As explained by Chang, Sung, and Chiou (2022), effective instructional leadership can help improve teacher self-efficacy, ultimately positively impacting student learning outcomes. In this case, the head of the pesantren who focuses on developing quality teaching skills will be able to motivate teachers to achieve better learning goals. However, the head of the pesantren also faces challenges in supporting the pedagogic development of teachers, such as limited resources and managerial challenges in managing the pesantren. For example, Aas and Paulsen (2019) note that pesantren principals are often faced with budget constraints and high staff turnover rates, which can affect their ability to provide optimal support in the development of teachers' pedagogic competencies. Therefore, an appropriate and collaborative strategy between Islamic boarding school heads, teachers, and related parties is very important to ensure the smooth implementation of policies that support teachers' pedagogic competence.

D. Conclusion

The implementation of the principal's policy in improving the pedagogic competence of teachers at the Darunnajah Islamic Boarding School shows that structured policy planning, continuous evaluation, and collaboration involving teachers have a very important role in the development of teacher competence. In this case, the policies implemented by school principals focus on improving the quality of learning through comprehensive and systematic measures, which involve clear planning stages, routine evaluations, and providing space for teachers to participate in policy decision-making. The results of this study are in line with previous research, which states that good policy planning and continuous evaluation can improve teaching effectiveness and improve teachers' pedagogic competence (Wulandari & Arifin, 2020; Atstsaury et al., 2024). Collaboration between principals and teachers in policy design, as well as continuous evaluation, allows for policy implementation that is more responsive to changing dynamic educational needs.

In addition, the development of teacher professionalism through training and constructive feedback plays a key role in improving pedagogic competence. Although various policies have been implemented, challenges in implementation, such as resistance to change and limited resources, still exist. Therefore, it is important for school principals to maintain a commitment to the development of pedagogic skills through inclusive and evaluation-based policies. Therefore, the principal's policy at the Darunnajah Islamic Boarding School leads to a holistic approach, focusing on collaboration, evaluation, and continuous improvement to improve teachers' pedagogic competence. This approach is in line with transformational leadership principles that emphasize the importance of motivation, collaboration, and sustainable professional development. In the face of the existing challenges, support from school principals who focus on developing teacher professionalism through adaptive and responsive policies is essential to create a quality learning environment.

E. REFERENCES

Al-Kamzari, F., & Alias, N. (2025). A systematic literature review of artificial intelligence (AI) in secondary school physics: applications, benefits, and challenges. *Interactive Learning Environments*.

- <https://doi.org/10.1080/10494820.2025.2508323>
- Al-Zahrani, A. M., & Alasmari, T. M. (2025). A comprehensive analysis of AI adoption, implementation strategies, and challenges in higher education across the Middle East and North Africa (MENA) region. *Education and Information Technologies*, 30(8), 11339–11389. <https://doi.org/10.1007/s10639-024-13300-y>
- Alotaibi, N. S., & Alshehri, A. H. (2023). Prospers and Obstacles in Using Artificial Intelligence in Saudi Arabia Higher Education Institutions—The Potential of AI-Based Learning Outcomes. *Sustainability (Switzerland)*, 15(13). <https://doi.org/10.3390/su151310723>
- Ariyaratna, G. D. W. M., & Rajapakse, R. A. C. P. (2024). Teaching Artificial Intelligence in Junior Secondary Education Using an Authentic Approach: A Qualitative Evaluation of the Grade Six AI Learning Module in Sri Lanka. *Proceedings - International Research Conference on Smart Computing and Systems Engineering, SCSE 2024*. <https://doi.org/10.1109/SCSE61872.2024.10550813>
- Asad, M. M., Younas, S., Ali, S., Churi, P. P., & Nayyar, A. (2023). Integration of artificial intelligence in the modern classroom: Prospects for digitization in education. In *AI-Assisted Special Education for Students With Exceptional Needs* (pp. 110–136). <https://doi.org/10.4018/979-8-3693-0378-8.ch005>
- Awad, P., & Oueida, S. (2024). The Potential Impact of Artificial Intelligence on Education: Opportunities and Challenges. *Lecture Notes in Networks and Systems*, 920 LNNS, 566–575. https://doi.org/10.1007/978-3-031-53963-3_39
- Celik, I., Gedrimiene, E., Siklander, S., & Muukkonen, H. (2024). The affordances of artificial intelligence-based tools for supporting 21st-century skills: A systematic review of empirical research in higher education. *Australasian Journal of Educational Technology*, 40(3), 19–38. <https://doi.org/10.14742/ajet.9609>
- Farooq, S., & Mishra, P. (2024). Future trends and innovations in artificial intelligence. In *Artificial Intelligence: A Multidisciplinary Approach towards Teaching and Learning* (pp. 265–287). <https://doi.org/10.2174/9789815305180124010015>
- Fitria, D., Asrizal, A., & Lufri, L. (2025). Enhancing 21st-Century Skills through Blended Problem-Based Learning with Ethnoscience Integration: A Mixed-Methods Study in Indonesian Junior High Schools. *International Journal of Learning, Teaching and Educational Research*, 24(1), 464–480. <https://doi.org/10.26803/ijlter.24.1.23>
- Flogie, A., & Krabonja, M. V. (2023). Artificial Intelligence in Education: Developing Competencies and Supporting Teachers in Implementing AI in School Learning Environments. *12th Mediterranean Conference on Embedded Computing, MECO 2023*. <https://doi.org/10.1109/MECO58584.2023.10155054>
- Geramani, K., Mazzucato, A., Gaudiello, I., & Ioannidis, G. (2022). Artificial Intelligence in the secondary education: the paradigm of Edu4AI. *CEUR Workshop Proceedings*, 3265. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85142414946&partnerID=40&md5=a21442b2eb0178f0848fe2eb823d01b3>
- Gouveia, A. J., Costa, R., Gomes, S., Abreu, R., & Briga, L. (2025). Understanding AI Integration Challenges in Education: A Brief Systematic Literature Review. *Communications in Computer and Information Science*, 2479 CCIS, 3–16. https://doi.org/10.1007/978-3-032-02675-0_1
- Gusman, E., Gide, E., El Khodr, M., & Chaudhry, G. (2024). The Benefits and Challenges of Using Artificial Intelligence in Teaching English as a Foreign Language in Higher Education. *2024 21st International Conference on Information Technology Based Higher Education and Training, ITHET 2024*. <https://doi.org/10.1109/ITHET61869.2024.10837597>
- Hasanah, N. A., Aziza, M. R., Junikhah, A., Arif, Y. M., & Garcia, M. B. (2025). Navigating the use of AI in engineering education through a systematic review of technology, regulations, and challenges. In *Pitfalls of AI Integration in Education: Skill Obsolescence, Misuse, and Bias* (pp. 371–398). <https://doi.org/10.4018/979-8-3373-0122-8.ch016>
- Ismail, A., Razali, S. S., Hashim, S., Abiddin, N. Z., Masek, A., & Abd Samad, N. (2021). The Integration of Problem Based Learning in Generating 21st Century Skills. *2021 IEEE 12th Control and Systems Graduate Research Colloquium, ICSGRC 2021 - Proceedings*, 19–23.

- <https://doi.org/10.1109/ICSGRC53186.2021.9515211>
- Khaldi, M. (2025). Supporting personalized learning and students' skill development with AI. In *Supporting Personalized Learning and Students' Skill Development With AI*. <https://doi.org/10.4018/979-8-3693-8965-2>
- Lee, I., & Perret, B. (2022). Preparing High School Teachers to Integrate AI Methods into STEM Classrooms. *Proceedings of the 36th AAAI Conference on Artificial Intelligence, AAAI 2022, 36*, 12783–12791. <https://doi.org/10.1609/aaai.v36i1.21557>
- Lubis, J. I., Sapri, S., & Fithriani, R. (2024). The relationship between the ability of Islamic religious education teachers to analyze the curriculum and design learning at Lubuk Pakam High School. *Research and Development Journal of Education, 10*(1), 236. <https://doi.org/10.30998/rdje.v10i1.22322>
- Madanchian, M., Drazenovic, G., Ramzani, S. R., & Taherdoost, H. (2025). Integrating AI Tools to Enhance Learning Outcomes in Modern Education Systems. *Procedia Computer Science, 263*, 514–521. <https://doi.org/10.1016/j.procs.2025.07.062>
- Mahmud, M. M., Wong, S. F., A'seri, M. S. M., Ahmad, R., Yaacob, Y., Qazi, A., Mustamam, N. I., & Nagasundram, U. (2025). Exploring Academic Perceptions and Challenges in AI Integration in Higher Education. *Proceedings of the 2024 the 16th International Conference on Education Technology and Computers, ICETC 2024*, 167–172. <https://doi.org/10.1145/3702163.3702410>
- Manaf, S., & Rokimin. (2025). *School Principal Leadership Management in Improving Emotional Intelligence of Islamic Secondary School Students. 11*(2), 213–222.
- Martínez-Comesaña, M., Rigueira-Díaz, X., Larrañaga-Janeiro, A., Martínez-Torres, J., Ocarranza-Prado, I., & Kreibel, D. (2023). Impact of artificial intelligence on assessment methods in primary and secondary education: Systematic literature review. *Journal of Psychodidactics, 28*(2), 93–103. <https://doi.org/10.1016/j.psicod.2023.06.001>
- Mnguni, L. (2025). AI as a teaching augmentor: A review of the integration of AI in science education. *Multidisciplinary Reviews, 8*(12). <https://doi.org/10.31893/multirev.2025390>
- Mudinillah, A., Kuswandi, D., & Hermansah, S. (2024). Optimizing Project-Based Learning in Developing 21st Century Skills: A Future Education Perspective. *Qubahan Academic Journal, 4*(2), 86–101. <https://doi.org/10.48161/qaj.v4n2a352>
- Mulatiwi, T., Supriadi, D., & Mulyanto, R. (2025). Implementation of Committee Partnerships on AI-Based School Policies at Public Junior High School. *International Journal of Engineering, Science and Information Technology, 5*(1), 46–50. <https://doi.org/10.52088/ijesty.v5i1.627>
- Muthmainnah, M., your Rehman, S., Cardoso, L., Marzuki, A. G., Inderawati, R., & Al Yakin, A. (2025). Enhancing the Retrieval and Application of English Teaching Resources Through Artificial Intelligence Technology as Computational Creativity in Short Story Writing. *Lecture Notes in Networks and Systems, 1288 LNNS*, 189–204. https://doi.org/10.1007/978-981-96-3102-5_14
- Owusu, E., Debrah, R., & Oladapo, H. (2025). Artificial Intelligence in Higher Education: Student Perceptions of the Adoption and Integration in Ghana, West Africa. *Lecture Notes in Computer Science, 15786 LNCS*, 257–271. https://doi.org/10.1007/978-3-031-93539-8_17
- Pan, M., Wang, J., & Wang, J. (2023). Application of Artificial Intelligence in Education: Opportunities, Challenges, and Suggestions. *Proceedings - 2023 13th International Conference on Information Technology in Medicine and Education, ITME 2023*, 623–627. <https://doi.org/10.1109/ITME60234.2023.00130>
- Pellegrino, J. W., & Hilton, M. L. (2013). Education for life and work: Developing transferable knowledge and skills in the 21st century. In *Education for Life and Work: Developing Transferable Knowledge and Skills in the 21st Century*. <https://doi.org/10.17226/13398>
- Priya, S. B., Harinderan, T., Rahaman, F., & Tamilselvi, M. (2025). Ethical considerations in applying AI and data science in education. In *Driving Quality Education Through AI and Data Science* (pp. 115–137). <https://doi.org/10.4018/979-8-3693-8292-9.ch006>
- Qin, H., & Wang, G. (2022). Benefits, Challenges and Solutions of Artificial Intelligence Applied in Education. *2022 11th International Conference on Educational and Information Technology, ICEIT 2022*,

- 62–66. <https://doi.org/10.1109/ICEIT54416.2022.9690739>
- Rahayu, A., Tarihoran, N., Rahmawati, E., Muslihah, E., & Ma'mur, I. (2025). Navigating the Digital Writing Landscape: EFL Students' Perspectives on ChatGPT Utilization. *International Journal of Learning, Teaching and Educational Research*, 24(5), 727–752. <https://doi.org/10.26803/ijlter.24.5.37>
- Rahimi, A. R., & Teimouri, R. (2025). Advancing language education with ChatGPT: A path to cultivate 21st-century digital skills. *Research Methods in Applied Linguistics*, 4(2). <https://doi.org/10.1016/j.rmal.2025.100218>
- Rajput, R. (2025). Overcoming Barriers to AI Implementation in the Classroom: A Roadmap for Educational Transformation. In *Navigating Barriers to AI Implementation in the Classroom* (pp. 401–436). <https://doi.org/10.4018/979-8-3373-1827-1.ch015>
- Ramesh, M. R. (2025). Challenges of integrating artificial intelligence with language curriculum: Addressing pedagogical, technological, and ethical barriers. In *Modern Methods for AI-Integrated Language Curriculum* (pp. 205–229). <https://doi.org/10.4018/979-8-3693-9606-3.ch008>
- Ramli, M., Fatra, M., Muradlo, M., Albana, H., Susanti, B. H., & Aldeia, S. (2024). Navigating the tech-savvy generation; key considerations in developing of an artificial intelligence curriculum. *LAES International Journal of Artificial Intelligence*, 13(4), 3942–3950. <https://doi.org/10.11591/ijai.v13.i4.pp3942-3950>
- Rizvi, M. (2023). Exploring the landscape of artificial intelligence in education: Challenges and opportunities. *HOURS 2023 - 2023 5th International Congress on Human-Computer Interaction, Optimization and Robotic Applications, Proceedings*. <https://doi.org/10.1109/HORA58378.2023.10156773>
- Salloum, S. A., Salloum, A., & Alfaisal, R. (2024). Objectives and Obstacles of Artificial Intelligence in Education. In *Studies in Big Data* (Vol. 144, pp. 605–614). https://doi.org/10.1007/978-3-031-52280-2_38
- Sarwar, U., Sanhong, T., Akhtar, M. W., & Aamir, M. (2025). Navigating Barriers to AI Implementation in the Classroom. In *Navigating Barriers to AI Implementation in the Classroom*. <https://doi.org/10.4018/979-8-3373-1827-1>
- Sholeh, M. I. (2025). Educational Transformation Through Artificial Intelligence: Implementation of AI Tools in the Teaching and Learning Process. In *Implementing AI Tools for Language Teaching and Learning* (pp. 25–40). <https://doi.org/10.4018/979-8-3693-7260-9.ch002>
- Suresh Babu, C. V., Yuvansankar, M., & Tharuneshwaran, K. (2025). Personalized learning and student engagement: Leveraging AI for enhanced learning experiences in distance education. In *AI and Learning Analytics in Distance Learning* (pp. 73–102). <https://doi.org/10.4018/979-8-3693-7195-4.ch004>
- Susilo, H., Kristiani, N., & Sudrajat, A. K. (2020). Development of 21st century skills at the senior high school: Teachers' perspective. *AIP Conference Proceedings*, 2215. <https://doi.org/10.1063/5.0000559>
- Thornhill-Miller, B., Camarda, A., Mercier, M., Burkhardt, J.-M., Morisseau, T., Bourgeois-Bougrine, S., Vinchon, F., El Hayek, S., Augereau-Landais, M., Mourey, F., Feybesse, C., Sundquist, D., & Lubart, T. (2023). Creativity, Critical Thinking, Communication, and Collaboration: Assessment, Certification, and Promotion of 21st Century Skills for the Future of Work and Education. *Journal of Intelligence*, 11(3). <https://doi.org/10.3390/jintelligence11030054>
- Wang, H. (2023). The application of "5G+AI" information technology in college English teaching. *ACM International Conference Proceeding Series*, 888–893. <https://doi.org/10.1145/3660043.3660200>
- Wu, D., & Zhang, J. (2025). Generative artificial intelligence in secondary education: Applications and effects on students' innovation skills and digital literacy. *PLoS ONE*, 20(5 May). <https://doi.org/10.1371/journal.pone.0323349>
- Yadav, S. (2024). Enhancing Digital Competencies of Teachers: A Roadmap for Modern Educators in the Digital Era. In *Fostering Teacher Skills and Critical Thinking in Modern Education* (pp. 109–134). <https://doi.org/10.4018/979-8-3373-1692-5.ch005>