BICED PROCEEDING
BUKITTINGGI INTERNATIONAL CONFERENCE ON EDUCATION
https://proceedings.uinbukittinggi.ac.id/biced
e-ISSN : xxxx-xxxx | p-ISSN : xxxx-xxxx
e-ISSN : xxxx-xxxx
p-ISSN : xxxx-xxxx

ADAPTIVE LESSON PLANNING TROUGH ARTIFICIAL INTELEGENCE: INSIGHT FROM TEACHER EXPERIENCE

Zeli Utari[1], Absharini Kardena[2]

***Corespondence :**
Email :
zeliutari@uinbukittinggi.ac.id

Authors Affiliation:

[1]Universitas Islam Negeri Sjech M. Djamil Djambek Bukittinggi, *Indonesia*

Article History :
Submission : 29 Sep 2025
Revised : 20 Nov 2025
Accepted : 30 Des 2025
Published

Keyword : Artificial Intelegence, Lesson Planning, Teachers, Adaptive Learning

Kata Kunci : *Kecerdasan Butan, Perencanaan Pembelajaran, Guru, Pembelajaran Adaptif*

Abstract

This study aims to explore the experiences and perceptions of teachers in utilizing artificial intelligence (AI) to develop adaptive and deep learning lesson plans. The study, which used a qualitative phenomenological method, included three active teachers who used AI. Semi-structured interviews, participant observations, and lesson plan documentation were used to gather data. To find important topics about the advantages, difficulties, and approaches of incorporating AI into lesson design, a thematic analysis was carried out. Despite issues with digital literacy and the need for additional training, research shows that AI improves efficiency and allows for more individualized learning based on student needs. To create lesson plans that are both successful and contextually relevant, teachers integrate AI-generated suggestions with their professional intuition. This study provides insightful information for the development of educational technology and the application of creative and flexible teaching methods.

Abstrak

Penelitian ini bertujuan untuk mengeksplorasi pengalaman dan persepsi guru dalam menggunakan kecerdasan buatan (AI) untuk mengembangkan rencana pembelajaran adaptif dan pembelajaran mendalam. Penelitian ini, yang menggunakan metode fenomenologis kualitatif, melibatkan tiga guru aktif yang menggunakan AI. Wawancara semi-terstruktur, observasi partisipan, dan dokumentasi rencana pembelajaran digunakan untuk mengumpulkan data. Untuk menemukan topik-topik penting tentang keuntungan, kesulitan, dan pendekatan penggabungan AI ke dalam desain pembelajaran, analisis tematik dilakukan. Meskipun terdapat masalah dengan literasi digital dan kebutuhan akan pelatihan tambahan, penelitian menunjukkan bahwa AI meningkatkan efisiensi dan memungkinkan pembelajaran yang lebih individual berdasarkan kebutuhan siswa. Untuk membuat rencana pembelajaran yang berhasil dan relevan secara kontekstual, guru mengintegrasikan saran yang dihasilkan AI dengan intuisi profesional mereka. Penelitian ini memberikan informasi yang mendalam untuk pengembangan teknologi pendidikan dan penerapan metode pengajaran yang kreatif dan fleksibel.

INTRODUCTION

People's lives have changed somewhat as a result of technology bringing society into the age of artificial intelligence (Xin, 2024.). A major change in the way educators plan, carry out, and evaluate their teaching methods is being brought about by the growing use of artificial intelligence (AI) in the classroom. Lesson planning is one of the most important but time-consuming educational jobs. It necessitates adherence to curriculum standards, modification to meet the needs of students, and integration of changing pedagogical approaches. AI solutions are being developed to help teachers streamline their planning procedures while retaining instructional quality as educational institutions face increasing pressure to improve efficiency and personalize learning quality. The implementation of AI-powered adaptive learning platforms has shown promising results in increasing engagement and improving learning outcomes (Ashokkumar Joshi, 2023).

The advancement of Artificial Intelligence (AI) has brought significant transformations to various sectors, including education. In the context of Education 4.0, AI offers powerful tools to enhance the learning experience by enabling adaptive,

personalized, and data-driven instruction (Mahesa et al., 2024). AI technologies assist educators in designing lesson plans that are more tailored to the individual learning needs of students, fostering deeper engagement and better learning outcomes (Nuralan, 2025.) One of the major significant opportunities provided by AI in education is its potential to reduce the digital divide. AI-powered educational tools can be deployed in remote or un der-resourced communities with limited access to quality education. These tools can offer interactive and engaging learning where access to quality education is limited. These tools can offer interactive and engaging learning experiences, even in under-resourced commu nities, democratizing education and providing equal opportunities for all learners. (Opesemowo, 2024)

AI-powered Lesson Planning and Design: AI has the potential to completely transform the instructional design and lesson planning processes. AI systems are able to suggest pertinent and interesting learning materials, exercises, and tests by evaluating enormous volumes of educational resources. Based on the demands and learning objectives of the students, AI-powered lesson planning tools can recommend the order and tempo of the lessons. This promotes effective and efficient teaching by streamlining the lesson planning process, giving teachers access to a multitude of carefully chosen materials, and guaranteeing that the instructional content corresponds with the needs of the students (Pareek, 2023). Deep learning places a strong emphasis on designing meaningful and introspective learning opportunities that actively include students and support the growth of their critical thinking and self-awareness. This is in line with phenomenology, a philosophical and methodological approach that emphasizes people's subjective lived experiences and the meanings they create via introspection. Beyond the superficial acquisition of knowledge, phenomenology in education promotes a deeper investigation of how educators and learners perceive and interpret the learning process. This is given a new dimension by incorporating artificial intelligence (AI) into adaptive lesson planning, which supports deeper engagement by offering context-aware and individualized learning opportunities. In order to understand the pedagogical and individual ramifications of such technology integration in education, this study used a descriptive phenomenological approach to investigate how instructors perceive and understand the usage of AI in creating adaptable, deep learning environments.

Research shows that AI can improve the effectiveness of educational practices by automating routine tasks, providing diverse instructional materials, and supporting teachers with data analytics to monitor student progress (Rifky, 2024). Despite these advantages, challenges such as technological infrastructure limitations, digital literacy, ethical concerns, and the risk of algorithmic bias remain prevalent issues to be addressed. (Nuralan, 2025.; Mahesa et al., 2024). From a phenomenological perspective, Schutz said which emphasizes understanding human lived experiences and subjective realities, investigating teachers' experiences with AI integration is crucial (Nindito, 2005.). This approach helps uncover how educators perceive and interpret the role of AI in their professional contexts, including how they balance AI-generated inputs with their pedagogical intuition and contextual knowledge. This research, therefore, aims to explore in depth the experiences and perceptions of teachers using AI for adaptive lesson planning, focusing on both the opportunities and obstacles they encounter. Understanding these lived experiences will provide insights for educational stakeholders to develop supportive policies, targeted professional development, and responsible AI applications in education. In sum, this study contributes to the growing body of knowledge on AI in education by offering a grounded and nuanced view of the interplay between technology, teacher agency, and pedagogical innovation in contemporary classrooms.

Artificial intelligence (AI)-powered adaptive lesson planning has demonstrated great promise for individualized education by modifying the pace, content, and instructional techniques to accommodate individuals' varied demands. Existing research, however, identifies gaps, including a lack of studies on the actual experiences and difficulties teachers face when implementing AI-driven adaptive lesson plans, the need for improved teacher preparation and training, and a lack of attention to the long-term effects of integrating AI into education. Furthermore, issues like algorithm biases, limitations in technology infrastructure, and making sure AI-generated information is pedagogically aligned with curricular standards are still not well understood. Closing these gaps is essential to improving the collaboration between educators and technology to develop more inclusive, contextually relevant, and successful adaptive learning environments.

METHODS

The method used in this study is a qualitative research method. Qualitative research is a means for exploring and understanding the meaning individuals or groups ascribe to a social or human problem. (Creswell, 2009.) This study employs a descriptive phenomenological methodology aimed at gaining an in-depth understanding of the subjective experiences of three teachers using artificial intelligence (AI) in adaptive lesson planning. Phenomenology is defined as a method of thought for acquiring new knowledge or expanding existing knowledge through logical, systematic, and critical steps, without relying on a priori assumptions/prejudice and being non-dogmatic (Hadi & Rusman, 2021.). Purposefully, participants were chosen based on their pertinent experience in this setting. Semi-structured in-depth interviews were used to collect data, enabling teachers to freely express their thoughts, feelings, and difficulties (Muntaha, 2022.) Participatory observations and data triangulation analysis of AI-assisted lesson plan materials further corroborated this.

In order to uncover the key meanings of the teachers' experiences, the data analysis process adhered to the phenomenological reduction stages, which included meticulous transcription and multiple readings of the interview data, meaning unit identification, clustering into main themes, and synthesis. The bracketing principle was followed to avoid researcher bias in interpretation. Member verification and expert consultations were used to validate the results in order to guarantee their validity and comprehensiveness. It is anticipated that this method will provide a thorough explanation of the pedagogical and individual ramifications of integrating AI into adaptive lesson planning, along with useful suggestions for the advancement of training and efficient use of educational technology.

RESULT AND DISCUSSION

RESULT

One of the most popular approaches in qualitative research, phenomenology encourages in-depth understanding of individuals' subjective experiences. This method focuses on experience descriptions in order to explore the meaning inherent in human experience (*Santioso, 2024)*. Phenomenology tends to look at data thematically to extract essences and essentials of participant meanings. (Miles Huberman, 2014.) Several important themes emerged from the phenomenological investigation on teachers' experiences using artificial intelligence (AI) in adaptive lesson planning. First of all, teachers thought AI was a useful tool that greatly streamlined the lesson planning process by giving them quick access to a variety of educational resources and creative teaching concepts. According to the respondents, AI improves the depth and relevancy of their lesson plans by enabling them to more effectively tailor learning materials to each student's needs.

Second, participants expressed that not being familiar with AI features occasionally prevented optimal use, citing issues mostly linked to digital literacy and the requirement for thorough training. In order to boost confidence and optimize the advantages of AI, they emphasized the significance of continual professional development. In order to keep lesson plans current and flexible enough to accommodate the particular dynamics of their classrooms, teachers stressed the importance of using their professional judgment when combining contextual knowledge with AI-generated recommendations. AI was seen as an empowering tool to supplement their knowledge, not as a replacement.

Based on the interview of three respondents, it can be said that the respondent's experience reveals that artificial intelligence (AI) operates as a highly effective and responsive personal assistant, significantly facilitating administrative tasks and saving considerable time. This advantage enhances satisfaction and alleviates the burden associated with repetitive duties. Nonetheless, the respondent underscores a primary challenge regarding the quality of data inputs, which critically influences AI's performance. Within an educational framework, AI is capable of accurately identifying students' learning deficiencies and supports personalized instruction through organizing groups and administering automated diagnostic assessments. The respondent's perspective portrays AI as a tool that provides alternative solutions, while ultimate decisions remain under the teacher's authority, thereby maintaining a balance between technological aid and human discretion. The usage of AI is perceived as empowering teachers professionally, enabling a greater focus on interpersonal relationships and the cultivation of students' non-cognitive skills, alongside a transformation of the teacher's role towards that of a facilitator and designer of adaptive learning experiences. The respondent expresses optimism that AI will advance equitable educational opportunities, despite concerns related to data privacy and potential algorithmic biases. Adaptation to AI is realized through iterative trial-and-error, self-directed learning, and collaboration within teacher communities of practice, highlighting the necessity of openness to technological innovation.

DISCUSSION

One of the most exciting and challenging occupations is teaching, which requires teachers to juggle a wide range of duties that go well beyond the classroom. Adopting student-centred strategies that accommodate a variety of learning styles and aptitudes is one of the biggest problems facing educators. Planning classes that include technology or creative approaches to engage today's generation of learners presents unique problems. (Belloula, 2025). Rapid technology breakthroughs, especially in the area of artificial intelligence, are causing an unprecedented upheaval in the educational scene. In order to equip teachers to use these technologies effectively while preserving the human-centric elements of teaching and learning, this evolution calls for a fundamental rethinking of teacher education. AI integration in teacher education signals a paradigm shift in how we design and implement teacher preparation programs for the digital age, going beyond simply using new tools. This all-encompassing change covers a variety of aspects of teaching, including classroom management, professional development tactics, instructional design, and assessment procedures (Khuntia & Sipra Pradhan, 2025).

The way aspiring instructors draft lesson plans could be completely transformed by generative AI tools. Teachers may maximize their time and effort, promote individualized learning, and improve creativity by embracing these tools. To guarantee responsible use, it is crucial to address issues including ethical concerns and quality monitoring. Future educators can be better prepared for the AI-driven educational environment by incorporating generative AI technologies into teacher education programs, offering hands-on training, and encouraging partnerships with tech specialists. (Kehoe, 2023.)

The findings show that incorporating AI into adaptive lesson planning is a significant development in teaching methods that aligns with the needs of learning environments in

the twenty-first century. Teachers value AI's capacity to speed up and diversify planning activities, which makes it possible for deeper learning pedagogies to provide more individualized and meaningful learning experiences. The results, however, show that teacher preparedness and digital literacy are critical to the effective adoption of AI, underscoring the continued need for focused training and support mechanisms.

When paired with teachers' professional intuition, the adaptive use of AI improves the responsiveness and relevance of instruction, allaying worries that technology may depersonalize learning. This collaboration is in line with the deep learning tenets, which place an emphasis on student interaction, contextual adaptation, and reflection. Therefore, rather than replacing human pedagogical skills, AI should be viewed as an auxiliary partner that enhances teachers' ability to create flexible and student-centred learning experiences. Expanding access, improving teacher proficiency, and encouraging moral and responsible AI use in educational contexts should be the main goals of future initiatives.

CONCLUSION

The integration of artificial intelligence in adaptive lesson planning offers substantial benefits by enhancing efficiency and fostering innovation among educators, enabling them to design more personalized and meaningful learning experiences. Although AI makes it easier to access a variety of instructional materials and allows for the personalization of lessons to meet the needs of each individual student, its effective implementation greatly depends on teachers' digital literacy and availability of specialized training. Furthermore, the effective application of AI in lesson preparation enhances teachers' proficiency in modifying education for actual classroom situations rather than taking the role of professional judgment. To encourage in-depth, student-centred learning, instructors' professional intuition and AI capabilities must work in harmony. In order to optimize educational outcomes and promote sustainable teaching methods, future initiatives should place a high priority on thorough professional development, address digital equity, and highlight the ethical application of AI.

Ideas for teachers to improve their digital capabilities with regard to AI tools, educators are encouraged to engage in ongoing professional development. In order to share successful utilization of AI solutions, communities of practice must collaborate. In addition to promoting ethical awareness regarding algorithmic bias and protecting student data privacy, educators must maintain rigorous oversight, striking a balance between expert judgment and AI-generated recommendations. Meanwhile, here are few Ideas for researchers, With the goal to promote the adoption of AI technology, research should concentrate on analyzing successful training initiatives that improve educators' digital literacy. Examining the long-term effects of AI-assisted adaptive learning across a range of student demographics is also crucial, as is determining how individualized learning routes affect engagement and academic success. Additionally, frameworks for reducing bias in AI education materials must be developed, along with an analysis of ethical issues. Finally, to maximize instructional quality and enhance teaching efficacy, it is critical to investigate the dynamic interplay between AI-generated recommendations and human professional.

REFERENCES

Ashokkumar Joshi, M. (2023). Adaptive Learning through Artificial Intelligence Corresponding Author*. *International Journal of Innovative Research in Science, Engineering and Technology*, *4*, 1–002. https://doi.org/10.35248/ijirset.23.4(1).001-002

Belloula, S. (2025). Empowering Educators: Leveraging AI to Revolutionize Lesson Planning. *International Journal of Research in Education and Science*, *11*(2), 264–280. https://doi.org/10.46328/ijres.1295

Creswell. (2009.). *Researh Design.*

Hadi, A., & Rusman, A. (2021.). *PENELITIAN KUALITATIF STUDI FENOMENOLOGI, CASE STUDY,*

GROUNDED THEORY, ETNOGRAFI, BIOGRAFI.

Kehoe, F. (2023.). Issue 2 Special Issue: The Games People Play: Exploring Technology Enhanced Learning Scholarship & Generative Artificial Intelligence The Irish Journal of Technology Enhanced Learning Ireland is the journal of the Irish Learning Technology Association. In *Irish Journal of Technology Enhanced Learning* (Vol. 7). http://creativecommons.org/licenses/by/4.0

Khuntia, U., & Sipra Pradhan, S. (2025). Innovating Teacher Education with AI: Exploring Inclusive Practices and Digital Literacy Integration. *International Journal of Advance Research Publication and Reviews*, *2*(2), 21–33. www.ijarpr.com

MetodologiPenelitianKualitatifok_compressed. (n.d.).

Miles et al. (2014.). *Qualitative Data Analysis.*

Nindito, S. (2005.). *Fenomenologi Alfred Schutz: Studi tentang Konstruksi Makna dan Realitas dalam Ilmu Sosial*.

Nuralan, S. (2025.). *TRANSFORMASI PENDIDIKAN DI ERA ARTIFICIAL INTELLIGENCE (AI)*.

Opesemowo, O. (2024). Artificial Intelligence in Education, Bridging Community Gap: A Phenomenological Approach. *International Journal of New Education*, *14*. https://doi.org/10.24310/ijne.14.2024.20505

Pareek, K. (2023). *The Effect Of AI In Classroom Teaching: Enhancing Learning Experiences And Teacher Support*. *25*(5), 36–39. https://doi.org/10.9790/0661-2505023639

Pendidikan, J., Pengajaran, D., & Mahesa, F. (2024). *Cendikia*. *2*(6), 146–152.

Rifky, S. (2024). Dampak Penggunaan Artificial Intelligence Bagi Pendidikan Tinggi. *Indonesian Journal of Multidisciplinary on Social and Technology*, *2*(1), 37–42. https://doi.org/10.31004/ijmst.v2i1.287

Santioso et al. *(*2024*). Qualitative Research Concepts: Phenomenology, Grounded Theory, Ethnography, Case Study, https://doi.org/10.38035/sjam.*

Xin, L. (2023.). *Research on Challenges and Reshaping of Role of College English Teachers in the Context of the AI Era*. http://www.stemmpress.com