

Exploring the Integration of Artificial Intelligence in Lesson Planning for Pre-service Teachers

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Abstract

The use of artificial intelligence (AI) in pre-service teachers' lesson planning is covered in detail in this abstract. With the revolutionary changes in education, artificial intelligence has become a useful tool for improving instructional design. Pre-service instructors can gain from the examination of student performance data by utilizing AI tools, which enable customized and adaptive lesson plans. In addition to streamlining the planning process, the AI-driven strategy makes it easier to implement focused interventions that are tailored to each learner's needs. The combination of AI and pre-service teacher education has the power to upend established paradigms and create a dynamic, adaptable learning environment. The need to integrate AI into pre-service teacher preparation is emphasized in this abstract, which also highlights how it might improve student outcomes and better equip teachers for the intricacies of contemporary classrooms.

Keywords: Artificial Intelligence, Lesson Planning, Pre-service Teachers

Introduction

Artificial Intelligence has many definitions. AI is a machine that thinks, understands languages, solves problems, and diagnoses medical problems. AI is often defined as a computer system. Nowadays, AI has become a very crucial part of our education system. If we want our K-12 learners to become AI-friendly, we need to train our teachers. This research project aims to explore the integration of lesson planning in pre-service teachers. Here, AI integration means how a teacher can make his or her lesson planning easy with the help of AI. When teachers will deliver this lesson plan, what kind of changes will they find? AI assistants reduce routine teaching burdens, AI provides teachers with recommendations for their student's needs and extends their

work with students and AI that helps teachers to reflect, plan, and improve their practice.

Integration of AI in Lesson Planning

Examples of AI tools for lesson planning include Gooru, Edmentum, and Carnegie Learning. These tools utilize algorithms to analyze student data, develop personalized learning paths, and produce insightful reports for teachers. By leveraging AI, teachers can create and deliver more effective lessons tailored to each student's unique learning style. AI is a helpful tool for lesson planning. It can provide ideas, write lesson goals, suggest activities, and save you time. However, AI doesn't replace your creativity, judgment, and expertise. Always review and adjust any AI-generated content to fit the needs. The incorporation of Artificial

Intelligence (AI) has started to transform the way educators produce educational materials. Artificial Intelligence is being used by a lot of schools to assist streamline administrative work and improve productivity. In order to guarantee that every student is engaged and receives an education that is more tailored to their abilities and learning style, others are using it to design more customized lesson plans.

Research Questions

The basic research questions for the present study were:

- How does the integration of artificial intelligence (AI) in lesson planning impact the effectiveness of pre-service teachers' instructional strategies?
- What are the perceived benefits and challenges of using AI in lesson planning among pre-service teachers?

Significance of Research

First, pre-service teachers are at the center of their education, transforming from learner to teachers. Understanding how to effectively integrate lesson plans at this stage lays the foundation for their future teaching practices. This topic is important because it directly affects the quality of education of these future teachers. Well-designed lesson plans are essential to creating interesting and effective learning experiences for students. Pre-service teachers who are able to integrate lesson plans are better equipped to provide well-structured and organized instruction that promotes a positive and effective learning environment. In addition, research into the integration of AI into lesson plans touches on the evolving landscape of teaching methods. As educational approaches continue to incorporate technology and innovative

pedagogy; pre-service teachers must be familiar with modern lesson planning techniques.

Brief Literature Review

A plan of action is only a course's draft. For instructors to use in their classes, lesson plans are essential (Ball & Cohen, 1996). Learning objectives, which outline what participants should learn; learning activities, which describe how teaching and learning are done; and materials, which are resources used during instruction, should all be included in these drafts. Another study conducted about implementing technology in lesson plans shows that pre-service teachers expect to get support on what they need to learn for their future careers (Janssen & Lazonder, 2015), the development of web technologies, there are websites and software that provide lesson plans for teachers. Cairncross and Mannion (2001) noted that the utilization of technology proved beneficial for aspiring educators in addressing the challenges encountered during the process of crafting lesson plans.

Similarly, Pratiwi et al. (2020) discovered that lesson planning software was beneficial for both novice and seasoned educators across different types of educational institutions. Furthermore, a cursory online search reveals the existence of paid websites offering lesson plans, including powerschool.com, commoncurriculum.com, and planbook.com. AI has the potential to transform special education by offering students customized learning experiences and helping teachers address each student's unique needs. However, it's crucial to remember that AI cannot replace human interaction and support. Teachers, parents, and caregivers will remain essential in assisting students with special needs (Li et al., 2021; Yufeia et al., 2020; Pedro et al., 2019).

Gaps in the Literature

While considerable research has been conducted on the effectiveness of AI in the teaching and learning process and its integration with various disciplines, there is a notable gap in the literature regarding the use of AI by pre-service teachers, specifically in the context of lesson planning. Current studies do not adequately address whether pre-service teachers are utilizing AI in their lesson plans or the type of training they receive, if any, to support this integration. This research project aims to fill this gap by investigating the extent to which pre-service teachers incorporate AI into their lesson planning and examining the nature of the training they receive to use these technologies effectively.

Methodology

Research design

This study used a mixed methods research design to collect both quantitative and qualitative data. This approach allows for a holistic understanding. Quantitative data were collected through google form, while qualitative data were collected through a google forms survey, while qualitative data were gathered via semi-structured interviews.

Sample selection

D. El. Ed. Pre-service teachers have been selected for this data collection

Tools

- Closed-ended questionnaire

Closed-ended Questionnaire: Designed to capture quantitative data on the familiarity, usage, and perceptions of AI in lesson planning.

- Semi-structured interview schedule

Semi-structured Interviews: Conducted

to obtain qualitative insights into the experiences and opinions of pre-service teachers regarding AI integration in lesson planning

Results

• Data analysis and interpretation

There are 49 responses obtained from Google Forms, and 91.8 per cent of pre-service teachers are familiar with the term AI. The data indicates a high level of familiarity with AI among pre-service teachers, with 91.8 per cent recognizing the term. This widespread awareness suggests that AI is a well-known concept within the educational community. Interestingly, 67.3 per cent of pre-service teachers have actively used AI tools in their lesson planning. This significant adoption rate implies that many pre-service teachers see value in leveraging AI technology for educational purposes, reflecting a trend towards integrating advanced technologies in teaching practices. 67.3 per cent have used this tool in their lesson plans. Despite the high adoption rate, only 40.8 per cent of respondents believe that AI is very effective in enhancing the learning experience for students. This disparity suggests that while many pre-service teachers are willing to use AI, there is some scepticism or uncertainty about its overall impact on education quality. It could indicate a need for more effective AI tools or a better understanding of how to utilize these tools optimally. 40.8 per cent have this belief that it is a very effective tool in enhancing the learning experience for students. A notable 83 per cent of pre-service teachers report improved student engagement since incorporating AI tools in lesson planning. This significant majority highlights one of the key benefits of AI integration: its potential to make lessons more interactive and engaging for students. Enhanced engagement is a crucial factor in effective learning, suggesting that AI can positively influence the

educational experience. 83 per cent of Pre-service teachers believe that there has been an improvement in students' engagement since incorporating AI tools in lesson planning. Despite the benefits, 53 per cent of pre-service teachers express concerns about using AI tools, primarily related to privacy and security. This highlights an important barrier to widespread AI adoption. Addressing these concerns through robust data protection measures and clear privacy policies will be essential to gaining the full trust of educators. 53 per cent of people have concerns related to AI tools which is majorly related to privacy and security concerns. 73.5 per cent of pre-service teachers didn't get any professional training during their teaching program. A significant finding is that 73.5 per cent of pre-service teachers did not receive any professional training on using AI tools during their teaching programs. This lack of formal training is a critical gap that needs to be addressed. Effective integration of AI in education requires that teachers are adequately trained to use these tools confidently and effectively.

Discussion

According to the study results, AI-generated lesson plans were found to be adequate for classroom use. These lesson plans effectively met desired learning objectives, incorporated suitable activities, outlined teachers' roles, and included appropriate assessment methods. Specifically, the learning objectives and activities aligned well with the course topics, demonstrating that AI can satisfactorily produce lesson plans. This supports previous findings by Tlili et al. (2023), indicating that AI tools can match classroom applications in these aspects. Teachers should get proper training in AI integration so that they will be able to solve the problem of privacy-related concerns. Pre-service teachers are using

it, but still, they have some issues. The lesson plan-making process can be easy and effective with the use of AI. Most of the pre-service teachers also observed it.

Comparison with Existing Literature

The existing literature primarily discusses the role of artificial intelligence in enhancing the teaching and learning process. However, there is a lack of research focusing specifically on how pre-service teachers utilize AI-integrated lesson plans to improve their teaching practices. This research aims to address this gap by examining how pre-service teachers incorporate AI into their lesson plans and the effectiveness they observe in the teaching and learning process as a result. The study will explore the specific ways in which AI integration influences lesson planning and identify any noticeable improvements in educational outcomes when these AI-enhanced lesson plans are employed.

Implications and Limitations of the Study

The teacher educator able to know all those challenges which are pre-service teachers are facing, and after knowing it policymakers will be able to do something regarding the same and teacher education program teacher educators may come to know about the challenges pre-service teachers face in their lesson plans and they will come to know the importance of the AI training AI based integrated training which are the essential part of the today's learning, and it can be implied only the research studies only just related to D. El. Ed. trainees. The area can be broader, and we can be very specific about the tool, but in spite of these limitations, it plays a significant role in teacher education programs.

Conclusion

Summary of key findings

The integration of AI in lesson planning significantly improved the efficiency of pre-service teachers, reducing the time spent on routine tasks and allowing for more focus on pedagogical considerations. AI-powered tools demonstrated a notable impact on personalizing learning experiences. The adaptability of lesson plans based on individual student needs resulted in increased engagement and improved comprehension across diverse learning. The study revealed challenges related to bias in AI algorithms, emphasizing the need for careful consideration and continuous monitoring to avoid reinforcing stereotypes and inequalities in educational content.

Contribution to the field

This research is an excellent guide

for teacher education programs, highlighting the need for comprehensive training in AI tools. This gift addresses a gap in teacher preparation and ensures that teachers have the skills and knowledge to take advantage of AI while meeting its challenges. This study, which focuses on issues related to bias in AI algorithms, highlights the need for more ethical considerations in the development and implementation of AI tools in education. This contribution informs policymakers and developers of the importance of technology design that promotes fairness and equity.

Recommendation for future teacher

Future recommendations include expanding and improving teacher training programs to include comprehensive AI integration modules. These programs should address not only the technical aspects of using AI tools but also ethical considerations and strategies to mitigate potential biases.

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