**International Journal of Humanities and Social Science Research**
**www.socialsciencejournal.in**
**ISSN: 2455-2070**
**Received: 20-02-2026, Accepted: 22-03-2026, Published: 06-04-2026**
**Volume 12, Issue 2, 2026, Page No. 32-34**

# Insights into the AI use for lesson planning in mathematics by pre-service teachers

**Zuha Aisha**
Guest Faculty, Department of Teacher Training and Non-Formal Education, Faculty of Education, IASE, Jamia Millia Islamia, New Delhi, Delhi, India

**Abstract**
National Education Policy, 2020, stresses that the teaching and learning of mathematics must focus on the development of the skills for critical thinking, problem solving, reasoning, scientific temper, etc. Therefore, teacher education programmes must aim at cultivating such skills among the pre-service teachers. This paper explores the usage of AI assistants (ChatGPT, Deepseek, Gemini, Perplexity, etc.) among the pre-service teachers for their mathematics lesson planning. The paper attempts to understand the role of AI assistants as a tool for preservice teachers to prepare their lesson plans for mathematics. This role is understood in terms of the lesson plans having the scope of inquiry-based pedagogical strategies, inculcating critical thinking and the students' initiatives in the discourse and discussion. A semi-structured interview schedule was used as a tool for data collection. The sample of the study consisted of 10 preservice teachers enrolled in the B.Ed. programme of a central university based in New Delhi. A thematic analysis of the interviews was done. The findings critically examine the preparation of teachers for mathematics classrooms and the implications for teacher educators in the age of AI.

**Keywords:** mathematics pedagogy, AI for lesson planning, AI, teacher education

## Introduction

National Education Policy (NEP), 2020 [3], recognises the critical role of technology specially in the form of Artificial Intelligence in the transformation and improvement of educational processes and outcomes, hence recognising the "*bi-directional*" relationship of technology and education at all levels (pg. 43). Further, the policy also leverages much importance upon mathematics and mathematical thinking for India's future and leadership role in the numerous upcoming fields and professions including artificial intelligence. Hence, it calls for mathematics classrooms which adopt a variety of innovative methods, such as the regular use of puzzles and games that make mathematical thinking more enjoyable and engaging (page 15, Ministry of Education, 2020) [3].

In this backdrop, the role of teacher education becomes vital in creating teachers that will shape the next generation. The policy highlights that teacher preparation requires "multidisciplinary perspectives and knowledge, formation of dispositions and values, and development of practice under the best mentors". NEP 2020 further lays emphasis on the teachers who are ready to engage with the latest advances in education and pedagogy and hardware will not just change what students learn in the classroom but how they learn, and thus these areas and beyond will require extensive research both on the technological as well as educational fronts (pg. 56, Ministry of Education, 2020) [3].

Artificial assistants such as ChatGPT serve as a valuable and powerful tool for pre-service mathematics teachers for lesson planning (Pişkin, 2024; Yilmas, 2024, Yanar *et al*., 2025) [4, 5]. ChatGPT aids in lesson planning in terms of the scope of the subject, generating innovative ideas, explanation of mathematics concepts, devising learning activities, including the problems and tools for evaluation, effective content, further it also serves the purpose of reviewing and improving the lesson plans. The role of the AI assistant is also seen as a tool to deepen the understanding of mathematical concepts, learning strategies, and teaching models by the pre-service teachers (Pişkin, 2024; Yilmas, *et al*. 2024) [4].

Yilmas *et al*. (2024) inferred the generated plans through ChatGPT as being only partially suitable for the grade level and the level of the students and not necessarily being based in the constructivist approach. According to Yanar, 2025 [5], there are advantages as well as constraints of using ChatGPT for lesson planning according to 5E approach in mathematics, in terms of providing creative and practical ideas, while relying on well-structured prompts to yield relevant results. The pre-service teachers show an inclination on AI tools such as ChatGPT professionally to enhance lesson planning and instructional practices.

AI assistants offer time-saving benefits, suggests innovative activities, and provide support to the pre-service teachers in their lesson planning thus serving as a scaffold but the roles of teacher agency, pedagogical knowledge, and content alignment remain thoroughly important (Alreiahi and Alrwaished, 2025) [1]. ChatGPT use in lesson planning, from content generation to final refinement has the challenges of adapting the AI-generated content to meet developmentally appropriate practices and specific classroom needs (Yu *et al*., 2026) [2].

In the purview of the above discussed policy perspectives, and related studies, the present paper explores the use of artificial intelligence assistants by the pre-service teachers to plan lessons for their mathematics classrooms. The present paper aims to explore the research questions: What is the role of artificial intelligence tools, if any, for present mathematics classrooms by the pre-service teachers? How are artificial intelligence assistants equipping the pre-service teachers in their lesson planning, particularly in mathematics?

## Context, Sample and Tools of the Study

The study is based in one teacher education institute in Delhi. The sample of the study consisted of 10 pre-service teachers of Bachelor of Education (B.Ed.) programme

interning in various government or semi-aided schools across Delhi. The respondents include 04 female and 06 male students. These pre-service teachers were expected to plan their lessons following the 5E approach, which involves the Engage, Explore, Explain, Elaborate and Evaluate phases of mathematics pedagogy.

The tool for investigation used was a semi-structured interview schedule based on the following domains of lesson planning in mathematics

**Table 1:** Semi-structured Interview Schedule

| S. No. | Domain of Mathematics' Lesson Planning | Sub-themes |
|---|---|---|
| 1. | Frequency of utilizing AI assistants (ChatGPT, DeepSeek, Gemini, etc.) | Indicate on a 5-point Likert Scale |
| 2. | Role of AI in lesson planning | ▪ Most frequent prompts provided<br>▪ Frequency of additional prompts |
| 3. | If examples for critical thinking are offered | ▪ How frequently the AI assistant offers these in the generated plans? |
| 4. | Students' role in the classroom discourse and discussion | ▪ Requirement of additional prompts |
| 5. | Teachers' role in the classroom discourse and discussion | ▪ Satisfaction/agreement with the generated plans<br>▪ Alignment with your curricular objectives and learning outcomes. |

**Findings and Analysis**

The interviews conducted with the pre-service teachers indicated that, 9 out of 10 pre-service teachers depend upon AI assistants for their mathematics lesson planning. Pre-service teachers also use many additional prompts to tailor their plans according to their requirements and expectations. The ratings on a 5-point Likert scale, given to the usefulness of AI assistants was: Useful (by 7 preservice teachers), Neutral (by 2 preservice teachers); Not useful, by 1 preservice teacher.

The usage of AI is listed as, setting the learning outcomes for their lessons, generating real-life examples, writing the plan according to the 5E approach and helping with the proper language by all the ten respondents. Out of the total, 3 respondents reported relying on it for activities and demonstrations of the content. 5 respondents reported relying on it for "explanation of the content", 2 respondents used it for generating questions as part of the classroom discussion and 1 preservice teacher reported using it for generating images for the exercise questions.

It can be inferred that a majority of the preservice teachers use AI assistants for their mathematics lesson planning and also feel satisfied with the generated plans. Further, the AI assistants have the potential to help the preservice teachers in terms of their understanding of the content, improving the language of their plans and setting up plans in a particular or desired format. The study of Yamar, 2025 also points out ChatGPT being a valuable yet evolving tool for fostering innovation and efficiency in mathematics education. Alreiahi and Alrwaished, 2025 [1], also point out the scaffolding role of the AI assistants in the lesson planning exercise.

The respondents indicated that the AI assistants allow for various "real-life examples" according to the age-level. However, pre-service teachers also recognise that the resulted examples need not be as per the understanding and context of the children in their classroom. The preservice teachers majorly start with "simple" prompts, only 3 teachers reported tailoring the prompts according to their own classrooms. AI assistants allow for various "real-life examples" according to the age-level. However, pre-service teachers also recognise that the resulted examples need not be as per the understanding and context of the children. The role of human intervention in the use of AI assistants cannot be denied as is highlighted by the above research investigations on the aspects of lesson planning.

Interestingly, preservice teachers also seem to rely on these assistants for setting the "learning outcomes" for their own classrooms. A lack of viewing their mathematics classrooms as spaces for developing logical or critical thinking skills is also suggested by the analysis of the interviews. Though "questions" are generated by the pre-service teachers, yet they are mainly content-driven examples, relating previous and current content knowledge. A prospect of basing the plans "as per the context" of the students emerges here, which needs to be further explored and improvised by the pre-service teachers. The study of Alreiahi and Alrwaished (2025) [1] also highlights the potential of AI in teacher training programs, while duly considering the irreplaceable essential skills of critical thinking and professional judgment.

In the present study, a sense of "dependency" is also felt by the preservice teachers by relying on these tools. This is also pointed out by the study of Yilmas, 2024 in terms of the productivity and creativity of the preservice teachers being affected by the use of ChatGPT in the long run. Interviews also suggest the use of AI assistants mainly for their own "delivery of the lesson, demonstration, using examples, question-solving" rather than fostering mathematical skills, also highlighted by the other studies that AI assistants need to be viewed only as a support system and not a replacement for preservice teacher's own knowledge and expertise (Piskin, 2024). The integration of AI assistants has implications for teacher training and future research on AI integration (Yanar, 2025) [5].

**Discussion and Conclusion**

The presented paper is a preliminary effort to include the aspect of AI assisted lesson planning by the preservice teachers in the teacher education discourse and the larger curriculum frameworks. AI-assisted planning can aid in tailoring the lessons according to the diversity of the students' needs and context. However, the engagement also needs to promote deeper understanding of mathematical concepts in terms of mathematical skills. Suitable *prompts* to the AI assistants can support critical thinking, problem-solving, and the development of meaningful learning experiences. However, for preparing the future teachers for "*cutting-edge pedagogy*" as envisaged by NEP 2020, lesson planning involving the AI assistants need to be guided by the preservice teachers' and teacher educators'

understanding of the curricular outcomes of a mathematics classroom

**References**


1. Alreiahi NJ, Alrwaished N. Integrating AI tools into preservice mathematics teacher education: A qualitative study of lesson planning practices. Contemporary Educational Technology,2025:17(4):ep617. https://doi.org/10.30935/cedtech/17549
2. Yu HM, Lee H, Kim SH. Integrating ChatGPT in teacher education: Examining early childhood and elementary pre-service teachers' experiences in AI-assisted math lesson planning. Journal of Research in Childhood Education,2026:40(1):67–89. https://doi.org/10.1080/02568543.2025.2579668
3. Ministry of Education. National education policy 2020. Government of India, 2020. https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf
4. Pişkin Tunç M. Examining pre-service mathematics teachers' purposes of using ChatGPT in lesson plan development. Sakarya University Journal of Education,2024:14(2):391–406. https://doi.org/10.19126/suje.1476326
5. Yanar AN, Ergene Ö. Integrating artificial intelligence in education: How pre-service mathematics teachers use ChatGPT for 5E lesson plan design. Journal of Pedagogical Research,2025:9(2):158–176. https://doi.org/10.33902/JPR.202533163
6. Yilmaz Can D, Durmus C. From AI-generated lesson plans to the real-life classes: Explored by pre-service teachers. In: 10th International Conference on Higher Education Advances (HEAd'24), 2024, 18–21. https://doi.org/10.4995/HEAd24.2024.17060