## ORIGINAL RESEARCH PAPER

**Education**

## TEACHER TRAINING AND PROFESSIONAL DEVELOPMENT WITH UTILISATION OF AI

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**ABSTRACT**

AI in the education sector has become an intense topic of discussion and there have been mixed feelings about its integration into teacher training programmes. Through the following study, an attempt has been made to understand the impact of integrating AI in teacher training programmes on teachers' professional development and the students' outcomes. The primary method was used to achieve the purpose of this study. 50 educators participated in a survey questionnaire in which they were asked a variety of questions such as their satisfaction levels concerning AI teacher training programme and improvement in their skills and overall student performance. The results were largely positive with slightly negative responses from very few participants. The majority of educators felt satisfied and engaged with AI-led training platforms. It was discovered that teachers were positive that their pedagogical knowledge had improved with the utilisation of AI-led tools and teachers were able to share teaching materials with colleagues conveniently.

### INTRODUCTION

Teacher training and professional development are two pillars of fostering quality education for thriving children. Effective teacher training is understood by the amalgamation of understanding student thinking process, strong concentration on subject matter and instructional practices (Tammets & Ley, 2023). Like every professional, teachers are required to continuously grow in their expertise so that they are able to provide quality education to the children.

The use of AI for professional development has become a popular subject of discussion in every field. The education sector has started to consider the utilisation of AI for teacher training and professional development with mixed reactions partially because of scepticism concerning AI replacing teachers. AI in teacher training and professional development is necessary so that educators can use their time to build positive relationships with students.

Integrating AI technology provides an ideal opportunity for teachers to enhance comprehension of content and gain knowledge relevant to the contemporary world (Wilichowski & Cobo, 2023). This transformation has the potential to encourage critical thinking and problem-solving which can prove to be advantageous for educators. However, more extensive research and study are required to understand the augmentation strategies through technology such as AI, particularly for teacher training in the modern era.

### Statement Of The Problem

Advanced technology-driven platforms are becoming popular means of professional development in almost every field. The problem was identified in terms of integrating AI technology in teacher training programmes and professional development in the education sector. The intention of the study is to foster the continuous development of teachers and student performance by investigating the impact of AI-led platforms for teacher training on the learning experiences of teachers.

### METHODS AND MATERIALS

To understand the impact of AI utilisation in teacher training and professional development, the primary method has been carried out in this study. A quantitative tool in the form of a survey questionnaire was used for the study. Using quantitative data through questionnaires helps researchers gather insights statistically based on positive epistemology and arrive at objective and generalisable conclusions (Adley et al., 2023).

A total number of 50 teachers belonging to Rajasthan, India participated in a survey questionnaire in order to study the impact of technological tools on teacher training and professional development. Out of 50, 30 participants were females whereas 20 were males. Five groups of teachers were formed based on their age groups, namely **under 25, 25 – 34, 35 – 44, 45 – 54 and 55 or older** to ensure an in-depth analysis of the topic of the study.

Different aspects were covered through the survey questions in this study such as the impact of AI-led technology on teacher training, its effectiveness in sharing teaching resources with colleagues and to critically evaluate the impact of technology on the satisfaction of the teachers and overall student performance.
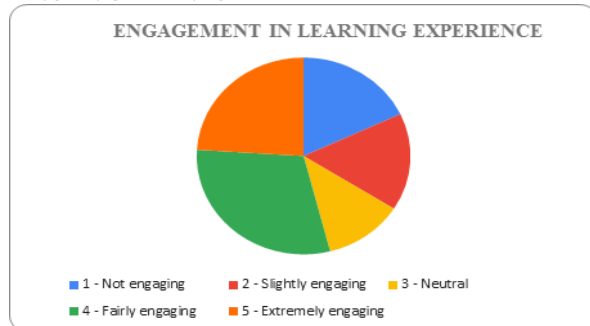
### RESULTS OF THE STUDY



**Figure 1:** *Engagement in Learning Experiences*

As per the above figure, participants were asked to rate their engagement in learning experiences enabled by adaptive learning platforms like Udemy and Coursera on a scale from one to five. 15% of participants were fairly engaged on these platforms and 12% were extremely engaged. 9% of participants did not find engagement on these platforms.
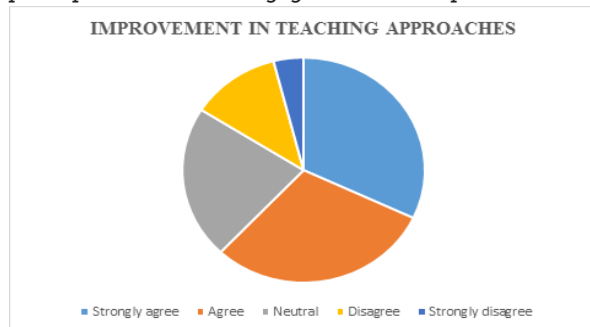


**Figure 2:** *Improvement in Teaching Approach through Technology Integration*

The data in the above image informs that 16% of participants

strongly agreed that technology integration improved their knowledge of different teaching approaches whereas 15% agreed. 11% were neutral, 6% disagreed whereas 2% strongly disagreed.
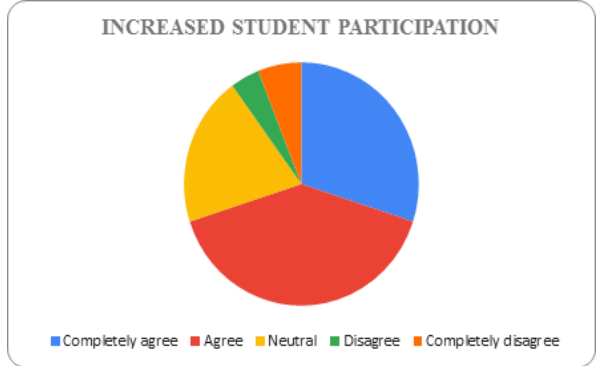


**Figure 3:** *Thoughts on Student Participation through Technology Incorporation*

20% of participants in the above figure agreed that incorporating AI-led smart classrooms into teaching methods led to increased participation of students whereas 15% completely agreed. 10% of participants were neutral whereas the ones who disagreed and completely disagreed were 2% and 3% respectively.
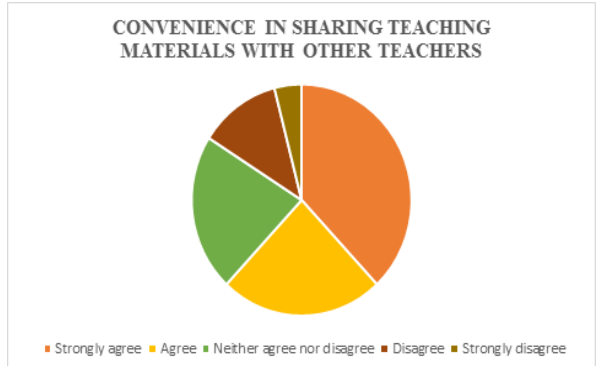


**Figure 4:** *Convenience in Sharing Teaching Materials with Other Teachers*

From the above chart, it can be determined that 19% of respondents strongly agreed that sharing teaching materials with colleagues using virtual meeting rooms is more convenient as compared to traditional methods. 12% of respondents agreed whereas 11% neither agreed nor disagreed. Only 6% and 2% disagreed followed by strong disagreement.
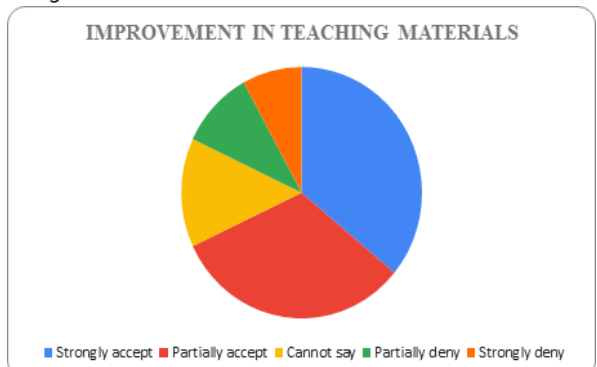


**Figure 5:** *Improvement in Teaching Materials*

Concerning the ability to improve teaching materials for students through Google Classrooms or similar tools, 18% of educators strongly accepted that they noticed enhancement followed by 16% who partially accepted it. 7% could not say,

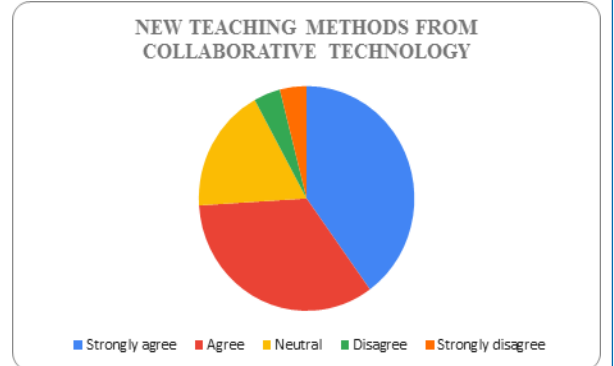5% of educators partially denied this statement whereas 4% strongly denied it.



**Figure 6:** *New Teaching Methods from Collaborative Technology*

From the data presented above, 20% of participants strongly agreed that AI-driven collaborative technological tools have helped teachers find new teaching methods and 17% agreed. 9% of teachers were neutral in this area whereas 2% of participants disagreed and the other 2% strongly disagreed.
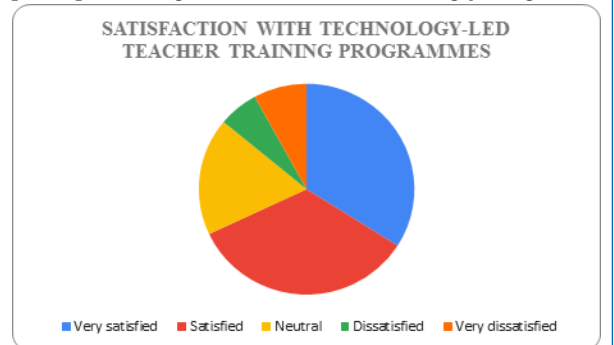


**Figure 7:** *Satisfaction with Technology-led Teacher Training Programmes*

Participants were asked if they were satisfied with the teacher training programmes led by technology to which 17% felt very satisfied and the other 17% felt satisfied. 3% of respondents claimed that they were dissatisfied and 4% were very dissatisfied. 9% of educators were neutral.
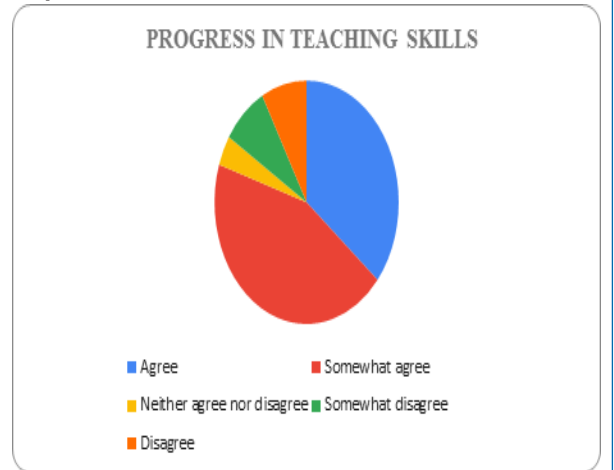


**Figure 8:** *Experience of Progress in Teaching Skills*

From the data presented above, 18% of teachers agreed that they experienced progress in their teaching skills after completing technology-driven training programmes whereas 22% of teachers somewhat agreed. 2% of teachers neither agreed nor disagreed whereas 4% of teachers somewhat disagreed and the remaining 4% disagreed.
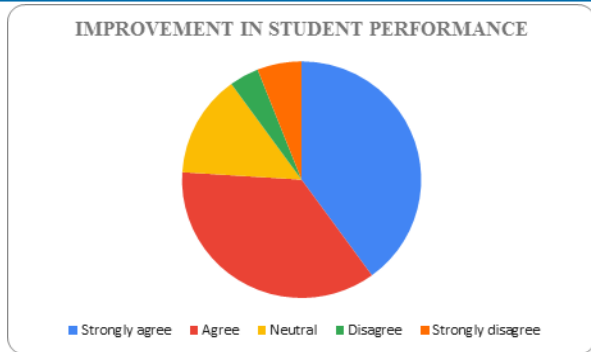
**Figure 9:** *Improvement in Student Performance*

In response to the question of whether AI technology-based training programmes improved students' performance, 20% strongly agreed whereas 18% of respondents agreed followed by 7% neutral response. Only 2% disagreed and 3% of teachers strongly disagreed.

## DISCUSSION OF THE FINDINGS

The finding on using AI technology for teacher training and professional development shows that AI-driven technologies have a positive influence on increasing the skills and proficiency of teachers. The findings show varying degrees of confidence among educators with regard to the use of AI-led technologies in teacher training and professional development. The high numbers of positive responses as compared to negative responses in using different AI tools in education indicate the potential of such advanced technologies in enhancing the pedagogical knowledge of the teachers as well as improving the overall student learning outcomes.

The findings have shown varying distribution of percentages among participants with regard to engagement levels using adaptive learning platforms for teacher training. From the results, it can be determined that AI-led tools offer novel methods of teacher training that have a positive effect on engagement of the teachers. However, these results demonstrate that there is a need for the examination of suitable factors that influence the engagement levels of educators.

Approximately 35 participants witnessed increased student participation since the incorporation of AI-led smart classrooms. It can be determined that teaching through smart classrooms led by AI technology can significantly create a highly interactive environment for students and enable high amounts of engagement levels. It has been emphasised by Cingillioglu et al., (2024) that gamification and simulation of conversational learning experiences through AI-based technologies can significantly impact student engagement.

Based on the findings, it can be determined that a majority of educators find convenience in sharing teaching materials with other teachers with the help of technology such as virtual meeting rooms as compared to traditional methods. From the findings, it can be asserted that collaborative AI-governed tools simplify the sharing processes of teaching materials among teachers and they are able to enhance their teaching qualities.

Similarly, the findings based on improvement in teaching materials are positive in nature which signifies that advanced technologies may assist teachers in creating compelling teaching materials. Integration of AI technology is beneficial in enhancing teachers' skills and knowledge as it provides feedback on the effectiveness of instructional practices (Celik et al., 2022).

20% of respondents were strongly positive about the fact that collaborative technological tools have helped educators find new teaching methods. This result signifies that AI tools encourage innovation and creativity in finding new teaching methods for educators. It can be determined that teachers are able to adapt to the changing dynamics of education and gain innovative insights with regard to their teaching methodologies through collaborative technological tools.

A large number of participants felt satisfied with AI-led teacher training programmes. This positive reaction indicates that AI-driven teacher training programmes enhance the professional development of teachers. It is however noticeable that a few respondents did not share the same positivity which signifies that there is a need to personalise and align training programmes with the different preferences of the teachers. Sămărescu et al., (2024) accentuated that with the integration of AI in education, understanding the perception of teachers and using it in developing teacher training programmes is an imperative consideration.

The findings show that a majority of teachers felt progress in their teaching proficiencies after completing technology-governed training programmes. However, some educators showed uncertainty which again points out that there is a need for intervention of personalised professional development approaches with the incorporation of AI-driven technologies. The findings show that approximately 31 out of 50 educators felt an improvement in their knowledge concerning different teaching approaches. This means that most educators are positive about the usage of AI-governed technologies in diversifying their teaching methods in their practice. The results show that AI has the potential to enable teachers to design their teaching methods in accordance with the diverse needs of the learners. However, the varying degrees of responses concerning the role of AI-led teacher training programmes in the improvement of students' overall performance indicate that there is a need to explore the evidence which can attest to the claims.

## CONCLUSION

From the discussion of the obtained results, it can be concluded that AI-led teacher training programmes have a positive impact on the professional development of teachers. The large number of positive responses concerning progress in teaching proficiencies, sharing teaching materials, enhancing pedagogical knowledge and improved student participation indicate that AI-led tools enable teachers to facilitate innovation in their teaching approaches and effectively adapt to the changing educational context. A few disagreements on the use of AI in teacher training programmes indicate that the personalisation of AI technology in teacher training to meet the diverse preferences and needs of the teachers is required.

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