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An Experimental Study on the Impact of AI Video on Learning of Students-Teachers

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Abstract: ***Artificial Intelligence (AI) is opening up new opportunities for creating innovative instructional materials in education. This study investigated the effect of AI-generated instructional videos on the learning achievement of B.Ed. student-teachers in the selected topic of Narration. A pre-test post-test, non-equivalent control group quasi-experimental design was used. The sample included 48 first-year B.Ed. student-teachers, with 24 assigned to the experimental group and 24 to the control group. The experimental group received instruction via an AI-generated instructional video, whereas the control group was taught through conventional teacher-led instruction. A learning achievement test developed by the researcher was administered as both the pre-test and the post-test. Data analysis was conducted using mean, standard deviation, and t-test at significant levels of 0.05 and 0.01. The results revealed no significant difference in the pre-test scores of the two groups, demonstrating that they were equivalent prior to the intervention. Both the experimental and control groups showed significant gains from pre-test to post-test. In addition, a significant difference emerged in the post-test scores, with the experimental group achieving higher learning achievement. Overall, the findings suggest that both instructional approaches were effective, and the AI-generated instructional videos were more effective within the conditions of the present study. This enhanced effectiveness may be related to multimedia presentation and self-paced learning, because learners can pause, replay, and revisit instructional content. The study recommends integrating AI-generated instructional videos with teacher-led instruction using a teacher-guided blended learning approach. Tacher educators and student-teachers should be equipped to use AI responsibly, and institutions and policy makers should facilitate appropriate AI integration by providing training, infrastructure, and suitable guidelines.***

Keywords: Artificial intelligence, AI-generated instructional videos, control group, experimental group, Learning, B.Ed. student-teachers, Narration, Teacher-led instruction, Blended learning

1. Introduction

One of the most influential technologies shaping contemporary society is artificial intelligence (AI). It makes human work easier by functioning as a helpful guide for finding whatever information people need. At present, interactive AI applications are used widely in medical, business, and other important areas. Even in education, AI has been gradually moving into a central position, sometimes seeming to shift the teacher into the background. Interactive AI especially AI-generated educational videos support students in learning difficult concepts by leveraging multimedia and enables them to learn at their own pace.
However, in the context of teacher education, which is a professional training programme, AI can never fully replace teacher-educators. Although it can assist student-teachers in mastering theoretical concepts, it cannot offer the rich practical experiences that are involved in microteaching, school teaching practice and internship AI tools can serve as useful guides and improve efficiency for both teacher educators and student-teachers. Nevertheless, users should not completely or uncritically rely on AI, because all information generated by AI systems is created and trained by humans, and they should understand that these systems work reliably only when they receive specific, accurate prompts and are properly programmed.

This leads to a major question: Is it pedagogically effective to use AI-generated instructional videos to teach student-teachers? If such videos are effective, they can be adopted as complementary tools in teacher education. If they are not effective, that outcome would strengthen the argument that no artificial intelligence can replace the teachers, who teaches by understanding student's needs, contexts and emotions.

Therefore, it is essential to carry out an experimental study on the impact of AI-generated videos on student-teachers learning. Some research studies suggest that AI-based learning interventions are effective, whereas others report limited or no effect, producing mixed conclusions about AI in education. Hence, additional research is required.

The present study examines the impact of AI-generated instructional videos on the learning of first-year B.Ed. student-teachers by comparing their pre-test and post-test with those of student-teachers taught the same concepts through traditional teacher-led instruction. The findings of this study are intended to offer evidence-based recommendations to teacher educators, training institutions, policy makers and the government concerning the appropriate adoption, integration and regulation of AI-based learning resources in teacher education programmes.

2. Literature Review

Recent research has investigated how AI-generated instructional videos, along with other AI-driven learning tools, are being used within education and in teacher-education contexts.

1) (Novelina Andriani Zega, 2026) emphasized the contribution of AI-generated videos in elementary teacher education. The results indicate that these tools are effective in conveying theoretical information and for fostering essential teacher competencies, including critical thinking and collaborative skills.
2) (Pellas, 2025) examined 55 Greek pre-service teachers and reported that AI-generated instructional videos effectively reinforced self-efficacy, task performance and knowledge retention, thereby validating their value as resources in science teacher education.

3) (Oh, 2025) investigated the use of AI platforms that convert text into video and observed unexpected non-significant effects on some learning indicators, implying that simply using AI does not ensure better educational outcomes.
4) (Tombolini et al., 2025) assessed the use of AI-generated multimedia to support the sequencing of concepts and found that, although these videos may enhance memory retention, they are less effective than conventional approaches in promoting the logical organisation and sequencing of complex information.
5) (Zhang, 2025) conducted a comparative pilot study evaluating AI-generated instructional videos against human-led videos and found that AI-generated materials were comparable to human instruction in clarity and usability, but did not significantly exceed human-led instruction. In addition, participants identified specific weaknesses related to audio quality and the absence of human-like avatars.
6) (Cabrera-Solano et al., 2024) conducted a study with 84 pre-service EFL teachers in Ecuador using Fliki AI videos. The findings showed that the videos increased student engagement and comprehension, and participants also reported improved understanding of both linguistic and pedagogical concepts.

Above studies indicates that AI-generated instructional videos may improve engagement, comprehension, self-efficacy and learning outcomes in teacher education. However, because the evidence remains limited and is not fully consistent for B.Ed. student-teachers, this study is necessary to evaluate how these videos affect the learning achievement in this particular group.

3. Objectives

1) To assess the pre-test achievement scores of the experimental and control groups before the intervention.
2) To compare the pre-test and post-test learning achievement of first-year B.Ed. student-teachers in the control group (teacher teaching) and experimental group (AI-generated instructional video) for a selected concept (narration)
3) To determine whether AI-generated instructional video is effective in improving the learning achievement of first-year B.Ed. student-teachers, based on their pre-test and post-test scores.
4) To determine the effectiveness of AI video-based teaching on the academic achievement of students in the experimental group.
5) To derive evidence-based suggestions for teacher educators, policymakers, and government authorities regarding the appropriate adoption and integration of AI-generated instructional video in B.Ed. teacher-education programme.

Hypotheses

1) **H_{o1}-** There is no significant difference between the pre-test learning achievement scores of the experimental and control group in the selected concept, Narration, among B.Ed. student-teachers.
2) **H_{02}-** There is no significant difference between the pre-test and post-test learning achievement scores of the experimental group taught through AI-generated instructional video on the selected concept, Narration, among B.Ed. student-teachers.
3) **H_{03}-** There is no significant difference between the pre-test and post-test learning achievement scores of the control group taught through traditional teacher-led instruction on the selected concept, Narration, among B.Ed. student-teachers.
4) **H_{04}-** There is no significant difference in the post-test learning achievement scores of the experimental group taught through AI-generated instructional video and the control group taught through traditional teacher-led instruction on the selected concept, Narration, among B.Ed. student-teachers.

4. Methodology

1) Research Method

The present study employed the **experimental method of research** to examine the impact of AI-generated instructional video on the learning of first-year B.Ed. student-teachers.
A pre-test post-test non-equivalent control group design (quasi experimental design) was used, in which one group received traditional teacher-led instruction and another group received AI-generated instructional video on the same concept.

2) Sample:

The study included **48, 1nd year B.Ed. student-teachers** from **Sree Siddaganga B.Ed. College, Tumkur.**

The sample was divided into a control group consisting of 24 student-teachers (teacher-teaching) and an experimental group consisting of 24 student-teachers. (AI-generated instructional video).(Academic achievement in the first test was considered to group the students into control and experimental group)

3) Sampling Technique:

Purposive sampling technique was adopted.

Tool:

The **google form questionnaire** designed by the researcher to measure the learning achievement of the student-teachers was used as a tool to collect data. The test was administered as a pre-test before instruction and a post-test after instruction to both the control and experimental groups. The same tool was used in both conditions to ensure comparability of scores.

Validity

Validity of the achievement test was assessed by the subject expert in terms of it's clarity, relevance and correspondence with the research objectives and the language validity was also done by the language teacher educator for the use of appropriate vocabulary in the tool. The suggestions provided by the subject experts and the language expert were incorporated in finalising the tool for the present study.

Reliability

By administering the tool under similar conditions with consistent instructions and a standardized scoring procedure,

the tools dependability was guaranteed. This aided in preserving measurement consistency.

Statistical Technique:
The pre-test and post-test scores of the control and experimental groups were analysed using **mean, standard deviation (SD), and t-test** to determine the effectiveness of AI-generated instructional video on student-teachers learning achievement.

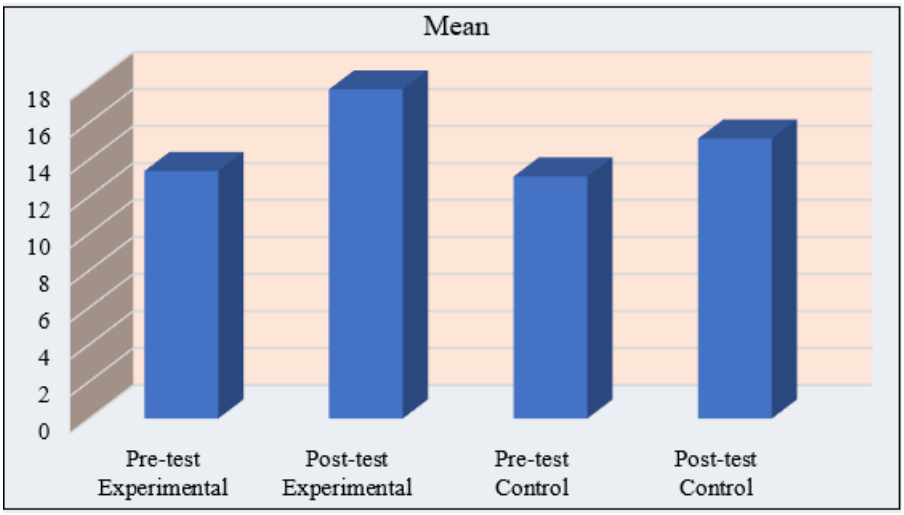
5. Findings and Interpretation

The present research was carried out to determine the effect of an AI-generated instructional video on the learning achievement of B.Ed. student-teachers in the selected concept of Narration. The sample comprised 48 B.Ed. student-teachers, with 24 assigned to the experimental group and 24 assigned to the control group. The experimental group received instruction through an AI-generated instructional video, while the control group received instruction through conventional teacher-led teaching. The collected data were analysed using mean, standard deviation and t-test.

Table 1: Mean and Standard Deviation of Pre-test and Post-test Learning Achievement Scores

Group	Test	N	Mean	SD
Experimental	Pre-test	24	13.38	1.88
Experimental	Post-test	24	17.79	1.89
Control	Pre-test	24	13.08	3.01
Control	Post-test	24	15.13	2.17

The above table indicates that the experimental group recorded a pre-test mean of **13.38** and a post-test mean of **17.79**, whereas the control group recorded a pre-test mean of **13.08** and a post-test mean of **15.13**.



Graph 1: Showing the Pre-test and Post-test mean scores of Experimental and Control group

Table 2: t-test Values for Testing the Hypotheses

Hypothesis	Comparison	t-value	df	Critical Value (0.05)	Critical Value (0.01)	Result
H_{01}	Experimental Pre-test vs Control Pre-test	0.403	46	2.013	2.687	Not Significant
H_{02}	Experimental Pre-test vs Post-test	16.044	23	2.069	2.807	Significant
H_{03}	Control Pre-test vs Post-test	6.144	23	2.069	2.807	Significant
H_{04}	Experimental Post-test vs Control Post-test	4.538	46	2.013	2.687	Significant

6. Interpretation of the Findings

In the comparison of the pre-test learning achievement scores of the experimental and control groups, the **calculated t-value (0.043) is lower than the critical values at both the 0.05 (2.013) and 0.01 (2.687) levels of significance.** Therefore, **the result is not significant, and the null hypothesis is accepted**. This suggests that there is no significant difference between the pre-test learning achievement scores of the experimental and control groups.
Regarding the pre-test and post-test learning achievement scores of the experimental group, the **calculated t-value (16.044) exceeds the critical values at both the 0.05 (2.069) and 0.01 (2.807) levels of significance.** Accordingly, **the result is significant, and the null hypothesis is rejected.** The mean score rose from 13.38 in the pre-test to 17.79 in the post-test, indicating a significant improvement in the learning achievement of the experimental group following instruction delivered through the AI-generated instructional video.

For the pre-test and post-test learning achievement scores of the control group, **the calculated t-value (6.144) is greater than the critical values at both the 0.05 (2.069) and 0.01 (2.807) levels of significance.** Hence, **the result is significant, and the null hypothesis is rejected.** The mean score increased from 13.08 in the pre-test to 15.13 in the post-test, demonstrating a significant improvement in the learning achievement of the control group after traditional teacher-led instruction.

When comparing the post-test learning achievement scores of the experimental and control groups, **the calculated t-value (4.538) is greater than the critical values at both the 0.05 (2.013) and 0.01 (2.687) levels of significance.** Thus, **the result is significant, and the null hypothesis is rejected.** The experimental group achieved a higher post-test mean score (17.79) than the control group (15.13), indicating significantly greater learning achievement among the student-teachers taught through the AI-generated instructional video.

7. Result

The study's principal findings are summarized below:

1) There was no significant difference in the pre-test learning achievement scores between the experimental and control groups. Accordingly, the null hypothesis was accepted, showing that the two groups are comparable in their initial learning achievement prior to the intervention.
2) There was a significant difference between the experimental group's pre-test and post-test learning achievement scores. Therefore, the null hypothesis was rejected, confirming a significant improvement after instruction delivered through the AI-generated instructional video.
3) There was a significant difference between the control group's pre-test and post-test learning achievement scores. Thus, the null hypothesis was rejected, indicating a significant improvement following traditional teacher-led instruction.
4) There was a significant difference between the experimental and the control group's post-test learning achievement scores. Consequently, the null hypothesis was rejected. The experimental group achieved a higher mean post-test score than the control group.

Overall, the results show that both instructional approaches significantly improved learning achievement. However, the AI-generated instructional video produced significantly higher post-test achievement than traditional teacher-led instruction for the selected concept of Narration.

8. Discussion

The current study investigated how AI-generated instructional videos affected the learning achievement of B.Ed. student-teachers in the selected concept of Narration
The pre-test comparison revealed no significant difference between the experimental and control groups, suggesting that both groups were equivalent in their initial learning achievement. This established a suitable foundation for analysing the effects of the respective instructional approaches.

A significant improvement emerged between the pre-test and post-test scores of the experimental group, demonstrating the effectiveness of AI-generated instructional videos in enhancing learning achievement. This result aligns with Pellas (2025), Cabrera-Solano et al. (2024) and Zega (2026), who documented positive outcomes of AI-generated instructional videos for learning and teacher education. The observed improvement may be explained by the multimedia character of AI-generated video, which can integrate explanations, visuals and examples. It also reinforces self-paced learning, since learners can pause, replay and revisit explanations whenever needed, including during revision.
A significant improvement was also observed in the control group, indicating that conventional teacher-led instruction effectively improved learning achievement. This underscores the ongoing value of a proficient teacher who can deliver immediate explanations, clarification, feedback, develop affective domain among students and interaction in response to learner's needs. Overall, the findings indicate that both approaches can support learning but, teacher can act as a guide and facilitate the student's learning through AI-video instruction along with his explanation.

However, the significant difference between the post-test scores of the two groups where the experimental group achieved a higher mean score suggests that AI-generated instructional videos were more effective within the conditions of the present study. This finding contrasts with Oh (2025), Tombolini et al. (2025) and Zhang (2025), who reported non-significant, limited or comparable effects of AI-generated multimedia in some learning settings. Such divergence may be associated with differences in learners, the content used, instructional design and learning outcomes.

The higher achievement of the experimental group may also reflect the flexibility of AI video-based learning. Unlike real-time instruction, video can be paused and replayed without reluctance. This may be especially beneficial for learners who hesitate to interrupt the teacher or who require repeated exposure to a concept.

Taken together, the results suggest that AI-generated instructional videos and teacher-led instruction should be integrated rather than treated as alternatives. AI can offer multimedia, flexible and diverse learning experiences but it can also not 100% accurate as it was created and programmed by human we should not forget this matter while using it. While the teacher is the heart of the classroom without their guidance any AI-instructional video will not be effective as it is undirected and students can understand as they grasp i in their own way so, along with this video teacher guidance, interaction and feedback is needed. Consequently, a teacher-guided blended learning approach may be particularly suitable for incorporating AI-generated instructional videos into teacher education.

9. Conclusion

The present study investigated the effect of an AI-generated instructional video on the learning achievement of B.Ed. student-teachers with respect to the selected concept of Narration. The experimental and control groups were comparable in their initial learning achievement. Both groups demonstrated significant improvement from pre-test to post-test, suggesting that both AI-generated instructional video and traditional teacher-led instruction were effective.

However, the experimental group achieved significantly higher post-test scores than the control group. Therefore, under the conditions of this study, AI-generated instructional video was more effective than traditional teacher-led instruction. This effectiveness may be linked to multimedia presentation and the opportunities for self-paced learning provided by pausing, replaying, and revisiting content.

Accordingly, the study supports integrating AI-generated instructional videos with teacher-led instruction through a teacher-guided blended learning approach. AI can enhance teaching by offering diverse, multimedia learning experiences, while teachers remain indispensable for guidance, interaction, and feedback. Teacher education institutions and policymakers should therefore promote the

responsible and pedagogically appropriate integration of AI into teacher education.

10. Educational Implications

The study's findings have implications for teacher educators, B.Ed. institutions, curriculum planners, policy makers and government authorities.

1) Teacher educators may incorporate AI-generated instructional videos alongside teacher-led instruction to deliver multimedia, varied and self-paced learning experiences.
2) Blended learning can be implemented by pairing Ai videos with teacher-led explanation, discussion, questioning and feedback.
3) Student-teachers should be trained to use AI critically and responsibly, including assessing the accuracy and relevancy of AI-generated content.
4) Teacher educators may benefit from professional development focused on designing, selecting, and integrating AI-supported instructional resources into lesson plans.
5) Teacher-educators should encourage student-teachers to use AI only for the enhancement of their existing knowledge, rather than as a replacement for their professional knowledge.
6) B.Ed. institutions should provide appropriate digital infrastructure and ensure access to dependable AI-supported learning resources.
7) Curriculum planners may integrate AI literacy and responsible AI practices into teacher-education curricula, enabling the future teachers to apply AI pedagogically.
8) Textbooks and digital learning platforms may include links to verified AI-instructional videos, simulations, and other AI-supported materials connected to relevant concepts, where appropriate.
9) Policy makers and government authorities may develop guidelines governing the AI-based resources in teacher education, with particular attention to accuracy, ethics, and teacher supervision. AI should support rather than replace teachers.
10) Government authorities should conduct professional development programmes for teacher-educators on using AI-based resources in teacher education.
11) Further experimental research may be carried out using larger samples, different subjects and concepts, and longer interventions to assess the broader effectiveness of AI-generated instructional videos.

References

[1] Cabrera-Solano, P., Ochoa-Cueva, C., & Castillo-Cuesta, L. (2024). Enhancing EFL Higher Education through Fliki Videos: An Artificial Intelligence Implementation Approach. *World Journal of English Language*, *15*(1), 424. https://doi.org/10.5430/wjel.v15n1p424

[2] Novelina Andriani Zega, E. H. (2026). Analysis of the Effectiveness of Using AI-Generated Instructional Videos through Problem-Based Learning Model on Reconstruction of Fundamental Science Concepts. *Jurnal Penelitian Dan Pengkajian Ilmu Pendidikan: E-Saintika*, *10*.

[3] Oh, S. (2025). EDUCATION CLASSES FOR PRE-SERVICE TEACHERS USING TEXT-VIDEO-BASED AI. *Journal of Baltic Science Education*, *24*(3), 538–551. https://doi.org/10.33225/jbse/25.24.538

[4] Pellas, N. (2025). The Impact of AI-Generated Instructional Videos on Problem-Based Learning in Science Teacher Education. *Education Sciences*, *15*(1), 102. https://doi.org/10.3390/educsci15010102

[5] Tombolini, E., Lembo, L., & Peluso Cassese, F. (2025). The impact of AI-generated multimedia on learning and information retention. *Italian Journal of Educational Technology*, *33*(3), 27–41. https://doi.org/10.17471/2499-4324/1490

[6] Zhang, D. (2025). *Transforming Higher Education with AI-Powered Video Lectures*. *abs/2511.20660*. https://doi.org/10.48550/arxiv.2511.20660