



Student Perceptions of AI-Narrated Voice-Over Presentations

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This study investigates the effectiveness of AI-narrated voice-over presentations in online education. The research compares student perceptions and satisfaction between traditional human-narrated and AI-narrated presentations in an online drone course. Using a mixed-methods approach, the study analyzes quantitative data from course evaluation surveys and qualitative feedback from student comments. Results indicate that AI-narrated content generally meets student expectations, with satisfaction levels comparable to human-narrated lectures in most areas. In fact, students reported feeling more encouraged to ask questions in the AI-narrated course. Students appreciated the quality of AI-generated materials, and did not significantly prefer a human speaker over AI-generated narration. The study suggests that AI-generated content can be a valuable tool in online education, potentially reducing educator workload without significantly impacting student satisfaction or performance. However, areas for improvement in AI-generated content were identified, including enhancing voice naturalness and errors in rendering human speech from text.

Key words: AI-generated content, online education, student satisfaction, voice-over presentations, drone course

Introduction

The use of artificial intelligence (AI) in education is transforming the way teaching and learning occur, offering innovative solutions that enhance scalability and efficiency. Among these applications, the integration of AI-generated narration in PowerPoint presentations represents a significant advancement. These presentations utilize AI technology to provide narrated content without requiring human involvement in voice recording, offering a scalable solution for educators and institutions (Gligorea and Cioca et al., 2023). However, these advantages are diminished if students respond poorly to the technology.

In recent years, the transition to online education has accelerated, driven by advancements in technology and a growing demand for flexible learning environments. Online courses traditionally rely on human-narrated lectures to deliver content, which can be resource-intensive and inconsistent in quality. AI-narrated voice-over presentations, powered by tools such as natural language processing and text-to-speech technology, offer a promising alternative, potentially reducing educator workload while maintaining or improving the quality of instruction (Mittal and Sai et al., 2024).

Despite the potential benefits, the adoption of AI-generated content in education raises several questions. The research question this paper will explore is as follows:

What are students' perceptions of recorded voice-over presentations using AI-generated narration compared to traditional presentations with a human speaker in an online course?

This study aims to evaluate the effectiveness of AI-narrated voice-over presentations similar to PPT in an online course setting. Specifically, it focuses on student satisfaction and their perceptions of the quality and effectiveness of these AI-narrated lectures. This research seeks to provide insights into the viability of using AI-narrated voice-over presentations as a teaching tool by conducting a detailed course evaluation survey and performing quantitative analysis on the collected data.

The primary objective of this research is to evaluate the effectiveness of AI-narrated presentations in meeting student expectations and influencing satisfaction. By analyzing quantitative and qualitative feedback, this study aims to contribute to the ongoing discussion on the role of AI in education and its potential to enhance teaching and learning experiences. Recent advancements in generative AI and its successful applications in education underscore the need to explore how these technologies can align with students' needs and institutional goals (Wang and Du et al., 2024; Rosak-Szyrocka and Żywiołek et al., 2024).

Literature Review

Overview of artificial intelligence in education

AI in education has gained significant momentum in recent years, offering innovative solutions to enhance teaching and learning experiences. AI-generated voice-over presentations represent one such advancement, aiming to automate the creation of narrated content (Spector et al., 2019). This literature review explores the current state of research on AI in education, focusing on AI-narrated content and its impact on student learning and satisfaction (Spector et al., 2019).

AI's role in education has evolved from early implementations like intelligent tutoring systems to more advanced applications such as adaptive learning platforms. These technologies have demonstrated potential in personalizing education, providing tailored feedback, and improving student engagement (Spector et al., 2019). AI-generated content, including voice-over presentations, builds on these foundations by leveraging natural language processing and text-to-speech technologies to create narrated educational materials. AI applications, including adaptive learning and generative AI tools, are increasingly integral to modern education, offering enhanced personalization and efficiency (Gligorea and Cioca et al., 2023).

Previous studies on AI-generated content in online learning

Previous studies on AI-generated content, such as generative AI tools, emphasize their ability to provide scalable and adaptive solutions for online learning (Mittal and Sai et al., 2024). These tools build on earlier findings about AI's potential while addressing newer challenges like data privacy and voice quality concerns (Rosak-Szyrocka and Żywiołek et al., 2024). Dai and Lin et al. (2019) highlighted the efficiency of AI-narrated voice-over presentations in delivering consistent, high-quality content, particularly beneficial in online and blended learning environments. These findings align with the broader trend of AI integration in education, as noted by Spector et al. (2019), who emphasized AI's evolving role from basic intelligent tutoring systems to more sophisticated adaptive learning platforms. The potential of AI to reduce educator workload, as discussed by Luckin and Holmes et al. (2016), is particularly relevant to AI-generated voice-over presentations, allowing teachers to focus more on interactive and personalized instruction. However, as pointed out by

Lundberg and Lee et al. (2017), concerns persist about the absence of human elements like tone and empathy in AI-generated content. This highlights the need for careful design and implementation of AI-generated materials, as emphasized by Mayer et al. (2020), who stressed the importance of factors such as voice quality, narration clarity, and multimedia integration in determining the effectiveness of AI-generated educational content. Recent advancements in generative AI, such as ChatGPT, demonstrate significant potential in creating engaging and adaptive learning materials, contributing to a more personalized education experience (Mittal and Sai et al., 2024).

Best practices in online education and AI integration

One significant advantage of AI-generated voice-over presentations is the potential to reduce the workload on educators. Producing high-quality narrated lectures is often time-consuming and resource-intensive. AI technology can streamline this process, allowing educators to allocate more time to interactive and personalized teaching activities (Luckin and Holmes et al., 2016). Additionally, AI-generated content can be easily updated and customized, ensuring that educational materials remain relevant and up-to-date (Baker and Smith et al., 2019). The integration of AI into hybrid learning environments has been shown to improve efficiency and engagement by leveraging tools like adaptive learning systems (Rosak-Szyrocka and Żywiołek et al., 2024).

Importance of student satisfaction in educational outcomes

Student perceptions of AI-generated content are crucial for its successful adoption. Research indicates that students generally find AI-narrated presentations clear and engaging, provided they are well-designed and meet their learning needs (Winkler and Hermann et al., 2019). However, there are concerns about the absence of human elements, such as tone and empathy, in AI-narrated content. While AI can replicate the technical aspects of narration, it often lacks the emotional nuances of human communication (Lundberg and Lee et al., 2017). It's worth noting that text-to-speech technology has significantly advanced in the past several years, and studies, even a few years old, may no longer be relevant.

The effectiveness of AI-narrated voice-over presentations in enhancing learning outcomes has also been explored. Studies suggest that these presentations can be as effective as human-narrated lectures in conveying information and supporting student learning (Aleven et al., 2016). However, the success of AI-generated content largely depends on its design and implementation. Factors such as the quality of the AI-generated voice, the clarity of the narration, and the integration of multimedia elements play a significant role in their effectiveness (Mayer et al., 2020). AI-driven adaptive learning platforms have demonstrated measurable improvements in student engagement, satisfaction, and learning outcomes, particularly in online settings (Wang and Du et al., 2024).

The literature highlights the promising potential of AI-generated voice-over presentations to enhance educational content delivery. These presentations offer a scalable and efficient solution for creating narrated lectures, with the potential to improve student engagement and learning outcomes. However, achieving success with AI-generated content requires careful attention to design and student perceptions.

Methodology

This study employs a mixed-methods approach to evaluate AI-generated voice-over presentations, a methodology supported by its ability to provide both quantitative and qualitative insights into educational interventions (Gligorea and Cioca et al., 2023). The workflow steps leverage best practices in AI-generated content creation and text-to-speech technology, which have been validated in similar educational research contexts (Mittal and Sai et al., 2024). The experiment uses student feedback from a course on the use of unmanned aircraft systems, commonly referred to as drones, in the built environment. The methodology combines quantitative and qualitative data for a comprehensive analysis of student experiences and performance. It begins with a literature review on AI's role in online learning and student satisfaction, followed by creating a workflow for generating AI voice-overs. The study then compares course evaluation surveys between control and experimental groups, quantitatively and qualitatively analyzing students' perceptions of the AI-assisted course. The findings are discussed in the conclusion. Figure 1 illustrates the overall methodology, while Figure 2 details "The Workflow," which outlines the process of recreating traditional human-narrated voice-over presentations using AI. This approach allows for a thorough evaluation of AI's impact on online education, specifically in the context of a drone course.

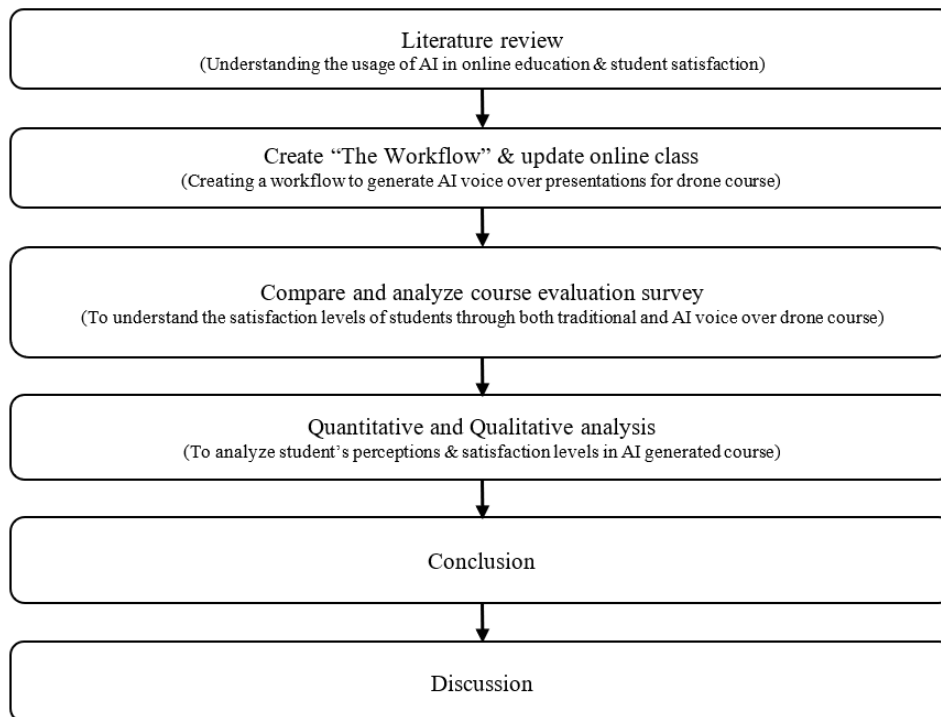


Figure 1. Stages of the methodology.

Steps of "The Workflow"

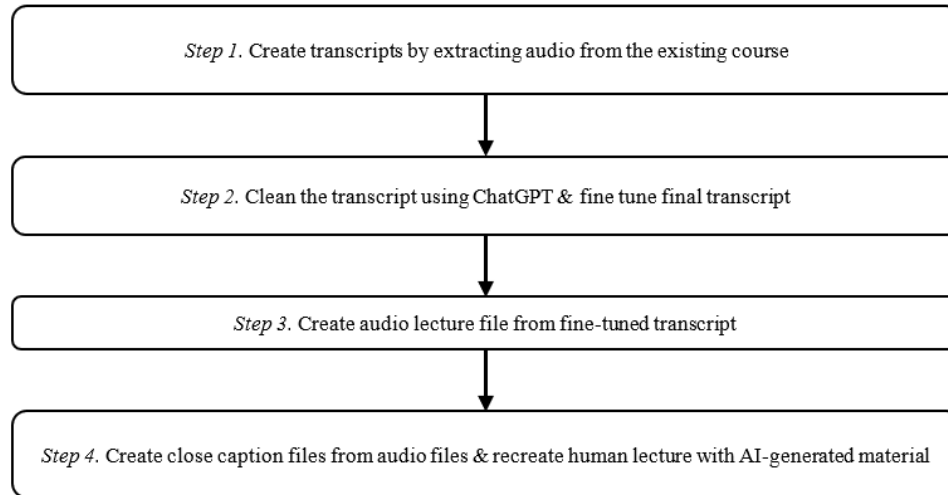


Figure 2. Steps of Workflow for creating AI-narrated presentations.

Step 1. Create transcripts by extracting audio from the existing course: The researchers extracted audio files from human-narrated presentations and converted them into transcripts using the KwiCut tool. The resulting transcripts were refined using ChatGPT for clarity and coherence.

Step 2. Clean the transcript using ChatGPT & fine-tune the final transcript: To enhance the quality of the transcripts, the researchers employed ChatGPT with a structured prompt tailored for rephrasing lecture content in a professional yet approachable tone. Transcripts were first edited using ChatGPT 3.5 and then further refined with ChatGPT 4.0. Subject matter experts refined the transcripts using ChatGPT for clarity, followed by manual proofreading by the research team. Final revisions were streamlined using a simplified prompt with ChatGPT 4.0, resulting in polished transcripts ready for audio generation.

Step 3. Create Audio Lecture file from fine-tuned transcript: The finalized transcripts were reviewed for pronunciation using Word's "Read Aloud" feature and then imported into the ElevenLabs text-to-speech application. The Antoni voice was selected for its natural, human-like quality, as custom voice profiles proved less effective. To address quality issues with longer transcripts, content was divided into smaller sections, producing consistent, high-quality audio files. The deep American male accent voice profile was chosen for its clarity and neutrality, ensuring the content remained professional and engaging. The researchers verified pronunciations and adjusted settings.

Step 4. Create close caption files from audio files & recreate human lectures with AI-generated material: Using the finalized audio files, research team created closed captions with KwiCut software and exported in SRT format. These captions were manually proofread for accuracy and integrated into Storyline, a presentation software. The original human-narrated audio was replaced with the AI-generated narration, and animations were synchronized with the new audio and captions. This process effectively transformed the original human lecture presentations into AI-narrated versions, maintaining consistency and quality across all materials.

Example of Human narrated lecture: <https://demo-drone-course.s3.amazonaws.com/course1/human-voice-presentation/story.html>

Example of AI narrated lecture: <https://demo-drone-course.s3.amazonaws.com/course2/ai-voice-presentation/story.html>

Course Evaluation Survey Analysis

Quantitative Analysis

Participants were divided into control and experimental groups. The control group consisted of students from two online classes where the material was provided using human-narrated presentations. The experimental group included students who took the same online course but with the presentations' scripts and narration generated by AI. The experimental group received a survey comprising questions from the host university's standard end-of-year course evaluation questionnaire, along with questions related to AI voice-over presentations. The survey featured a 5-point Likert scale and open-ended short answer questions. A total of 57 students completed the traditional human voice-over course and the end-of-year questionnaire during the Fall of 2023 and Spring of 2024, while 12 students enrolled in the AI voice-over course and completed the study's survey.

Course Evaluation Survey Questions

The Likert Scale questions from the host university's standard end-of-year questionnaire are shown below.

1. The learning outcomes in the course were clearly communicated.
2. The course assignments were related to the course learning outcomes.
3. I understood what was expected of me in this course.
4. The instructor clearly explained concepts, methods, and subject matter.
5. The instructor encouraged questioning and discussion of course topics from the students.
6. The feedback on my performance on assignments and tests supported my learning.
7. The course challenged me to think critically and communicate clearly about the subject.
8. Approximately how many hours did you spend in a typical 7-day week on learning activities outside of class time for this course?
9. Please indicate your satisfaction with the availability of the instructor outside the classroom by choosing one response from the scale. In selecting your rating, consider the instructor's availability via established office hours, appointments, and other opportunities for face-to-face or virtual interactions.

A simple T-test was conducted among the control group and experimental group students for each survey question. A summary of the descriptive statistics can be found in Table 1. Nearly all of the Likert scale questions between the two groups had P-values greater than 0.05 and thus were considered statistically the same. The only exception was question #5, which asks, "The instructor encouraged questioning and discussion of course topics from the students." The P-value for this particular question is less than 0.05; thus, it is considered statistically different. It was surprising to the researchers to learn that the students in the experimental group rated this higher (4.42<4.91) than the control group, suggesting they felt freer to ask the instructor questions than the students who participated in a human-narrated presentation. While Likert scale data is ordinal, studies like Norman

(2010) and Carifio and Perla (2008) argue that parametric tests, such as t-tests, are robust when sample sizes are adequate and data distribution approaches normality.

Table 1

Summary of Mean, Median & P-value of Course Evaluation Survey

Question No.	Mean		Median		P-Value
	Control Group	Experimental Group	Control Group	Experimental Group	
1	4.78	4.83	5	5	0.75
2	4.78	4.91	5	5	0.28
3	4.68	4.75	5	5	0.67
4	4.71	4.66	5	5	0.75
5	4.42	4.91	5	5	0.0008
6	4.59	4.83	5	5	0.13
7	4.50	4.75	5	5	0.15
8	2.26	2.41	2	2	0.41
9	4.43	4.75	5	5	0.09

AI-Related Course Evaluation Survey Questions

The experimental group was given additional questions in the course evaluation survey related to AI-narrated lectures. Those questions are provided below.

10. How satisfied were you with the quality of the material presented in the Part 107 lectures?
 11. How would you rate the AI-generated voice of the Part 107 lectures compared to a similar presentation with a human narrator?

The survey results of these questions are provided in Table 3. Students were generally satisfied with the quality of the Part 107 lecture materials, rating it 4.3 out of 5 on average. However, when comparing the AI-narrated voice to a human narrator, students gave a more moderate rating of 3.25, suggesting they found it adequate but not necessarily superior to human narration.

Table 2

Summary of Mean & Median of AI-related Course Evaluation Survey

Question No.	Mean	Median
10	4.30	4.50
11	3.25	3.50

Qualitative Analysis

Open-ended Course Evaluation Survey Question

Experimental group students were given one open-ended question in the course evaluation survey related to improvements to Part 107 lectures.

12. What improvements could be made to the Part 107 lectures?

The feedback from the students for the above question was collected and converted to a Word document, and then the data was analyzed using QDA Miner lite software. Then, the codes were categorized in terms of “Feedback” and “Improvements” and coded as “Positive feedback, Uncertainty” in the Feedback category and “Visual Aids, Course content coverage, Technical Issues, Voice quality concerns, Human Inclusion” in the Improvements category. Figure 3 shows the analysis performed in QDA Miner lite software.

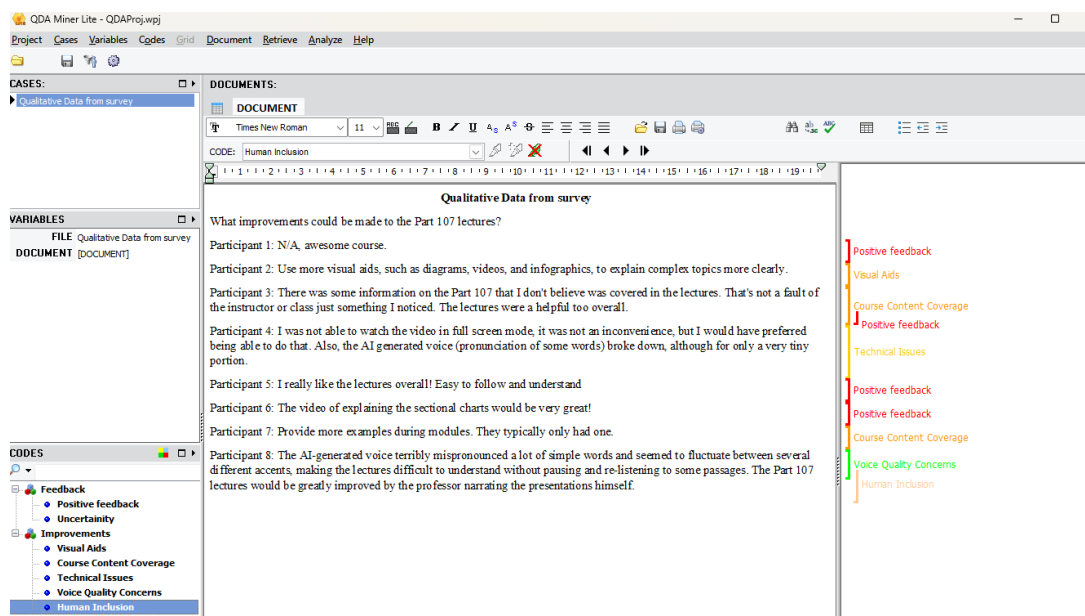


Figure 3. Image of the interface of QDA Miner Lite software used for analysis.

The researchers reviewed the findings and found that most students found the presentations acceptable, but they had some ideas to make them better. The students suggested more pictures and videos to help explain things, and they said the computer voice was hard to understand sometimes. They also want more examples in the lessons. So, to make things better, the researchers could add more pictures and fix the voice in the lectures. By making these changes, researchers can make the course more useful for everyone.

Conclusion

This study demonstrates that AI-narrated voice-over presentations can be a scalable and effective solution for online education, offering comparable levels of student satisfaction to human-narrated lectures. The results underscore the potential of AI to reduce educator workload while maintaining

educational quality. However, the findings also highlight the importance of addressing limitations, such as improving voice naturalness and integrating multimedia elements, to enhance the overall learning experience.

AI tools should be thoughtfully implemented alongside traditional teaching methods to balance efficiency with emotional engagement. By leveraging the strengths of both AI and human instructors, educators can create a more effective and personalized learning environment. Future studies should continue to refine these technologies and explore their applications across different educational contexts. Ultimately, this research contributes to the growing body of knowledge on AI's role in enhancing education, providing a foundation for further innovation in the field.

Discussion

The findings of this study highlight the potential of AI-narrated voice-over presentations as a valuable tool in online education. Students reported satisfaction levels comparable to human-narrated lectures, indicating that AI can effectively replicate many aspects of traditional narration. Interestingly, students in the experimental group felt more encouraged to ask questions, suggesting that AI-narrated presentations may foster a more open learning environment in specific contexts.

However, the study also reveals areas for improvement in AI-generated content. Feedback from students emphasized the need for more natural-sounding AI voices and the inclusion of visual aids to enhance understanding. While the scalability and efficiency of AI tools are clear advantages, the absence of human elements, such as emotional tone and adaptability, remains a limitation. Addressing these shortcomings will be critical for the broader acceptance and effectiveness of AI-generated educational materials.

Future research should explore hybrid models that combine AI-generated content with human interaction to bridge gaps in emotional engagement and personalization. Additionally, investigating the application of AI tools across diverse courses and learning styles could provide deeper insights into their impact on student outcomes. Understanding how these technologies can complement traditional teaching methods will be key to maximizing their potential in education.

Limitations

This study faced limitations due to the small and unbalanced sample sizes, with 57 participants in the control group and 12 in the experimental group. This disparity reduces statistical power, making it challenging to detect smaller but meaningful differences. Additionally, the sole reliance on Likert scale data and t-tests, without complementary non-parametric analyses, limits the robustness of the findings. The absence of confidence intervals further constrains the generalizability of results. Finally, qualitative outcomes such as engagement and satisfaction were underexplored, leaving gaps in understanding the holistic impact of AI-narrated presentations.

Note: This paper employed ChatGPT for grammatical proofreading and text rephrasing. ChatGPT was not used to source or generate any factual information, data, or reference citations. All research content and references are original, stemming from the author's own work and verified sources.

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