








# Utilizing AI-Driven Virtual Training Platforms to Enhance Smart Board Skills among English Language Teachers

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## Abstract

The present study sought to assess the impact of a virtual training platform, underpinned by artificial intelligence, on the development of smart board skills among English language teachers. This research employed a mixed-methods approach, combining both descriptive and experimental research methodologies. The study was conducted with a sample of English language teachers in Al Ain city, who were divided into two experimental groups. The first group utilised a standard virtual training platform, while the second group engaged with a platform incorporating artificial intelligence (AI). Data were analysed using an achievement test and a skills observation card for the smart board. The findings indicated statistically significant differences (at the 0.5 level) in favour of the group using the AI-based virtual training platform, with a mastery level of 80%. These results clearly demonstrate the positive impact of artificial intelligence technology on the development of smart board skills.

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**Keywords:** Virtual Training Platform, Artificial Intelligence, Smart Board, English Language.

## Introduction

### Background and Rationale

The current era is characterised by constant changes and advancements in educational technological innovations (Abulibdeh, Zaidan, & Abulibdeh, 2024; Alsalmi et al., 2023). Emerging interactive teaching and learning

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environments, alongside evolving research trends, are focused on technological innovations such as virtual training platforms and their effectiveness in diverse learning and training tasks (Hakimi, Katebzadah, & Fazil, 2024). These platforms are increasingly used across various sectors (Xu, Zhang, & Wang, 2024), and, via the Internet, they adhere to a philosophy of openness—encouraging unrestricted access to use, customise, improve, and redistribute training resources (Velychko & Fedorenko, 2024). This philosophy supports the free dissemination of knowledge for the benefit of society, aligning with the principle that such resources should be shared (Sanabria-Z et al., 2024).

Artificial intelligence (AI) technology is one of the most prominent technological variables, impacting various fields, including education. AI's continuous development enables educators to overcome numerous challenges in educational settings, managing them with skill and efficiency (Alomran & Alhazmi, 2023). AI is seen as a means to enhance and develop education, fostering high efficiency in teacher-student interactions and improving learner understanding and performance (Kujundziski & Bojadjev, 2025). Yashchenko (2014) asserts that AI theory focuses on developing intelligent systems through neural-like, multidimensional networks. These networks aim to replicate and enhance human cognitive functions, serving as a foundation for advancing AI applications. An important application of these technological innovations is the development of smart board skills among English language teachers. Rahayu's research (2024) explores the role of Smart Board Interactive technology in fostering learning innovation within schools. By integrating the principles of the Internet of Things (IoT) with touch and projection technologies, this study demonstrates how Smart Board Interactive technology enhances teaching and learning processes. It highlights the positive impact of this technology on student and teacher engagement, motivation, and educational outcomes.

### *Problem Statement*

Building on the findings of previous studies and considering the effectiveness of artificial intelligence applications within virtual training platforms for skill development, particularly in relation to smart board usage, the research problem was identified as a decline in smart board skills among English language teachers. This issue aligns with the recommendations of earlier research, which emphasised the importance of incorporating advanced technological tools, such as AI-powered virtual training platforms, to address gaps in teachers' technological competencies. The decline in smart board skills among educators highlights the need for targeted interventions to enhance these skills and improve teaching outcomes.

### *Study Questions*

This study tries to answer the following main question:

*RQ:* What is the effect of designing a virtual training platform based on artificial intelligence technology on development of smart board skills among English language teachers?

The following questions arise from the main research question:

1. What is the educational design of the virtual training platform based on artificial intelligence technology?
2. What is the impact of designing a virtual training platform based on artificial intelligence technology on developing the cognitive aspect of smart board usage skills among English language teachers?
3. What is the impact of designing a virtual training platform based on artificial intelligence technology on developing the performance aspect of smart board usage among secondary school teachers?

### *Research Aims and Significance*

The research aims to explore the applications of artificial intelligence across educational platforms and emphasise the role of technology through AI applications. The objectives include:

- Explore the significance of artificial intelligence in educational settings.
- Identify various artificial intelligence applications and their relevance to education.
- Propose a future vision for the broader adoption of artificial intelligence applications in the educational sector.

The significance of this research lies in its potential to:

- Assist English language teachers in overcoming challenges in delivering lessons effectively through the integration of AI-driven tools.
- Enhance teachers' academic and technical expertise in utilising technological innovations, thereby positively impacting the overall educational system.
- Support the continuous professional development of teachers, encouraging them to remain current with technological advancements in their field and fostering lifelong learning.

## **Theoretical Framework**

### *Virtual Training Platforms*

The electronic platform, facilitated by modern devices, is one of the most widely used tools across various

sectors of life. Smartphones and laptops have significantly integrated into education and scientific research, greatly enriching the educational process at all levels. A related study defines an electronic platform as “an integrated interactive educational software system with multiple sources on the web to create virtual classes that enable the trainer and trainee to communicate effectively face-to-face or asynchronously, ensuring active interaction” (Bajaj & Sharma, 2018). In line with this, the current research offers the following definition: “Interactive educational environments leverage a variety of web technologies, seamlessly integrating digital content management systems with social media networks. These environments utilise advanced artificial intelligence tools to facilitate the sharing of educational content and the exchange of ideas and perspectives.”

### **Justifications for Using Virtual Training Platforms in Education**

Almanthari, Maulina, & Bruce (2020) argue that there are several justifications for considering educational platforms as one of the key solutions to addressing numerous existing educational challenges. These justifications include:

1. A user-friendly digital environment, with an interface familiar to students, resembling platforms like Facebook.
2. An updatable digital environment, ensuring the content remains current.
3. Support for formal digital education through the participation of colleagues and experts.
4. The provision of diverse activities and discussions that enhance students' motivation to learn.
5. The ability to offer feedback to students, alongside continuous monitoring and evaluation.

Additionally, educational platforms have a wide range of other applications, including recording and managing lectures, displaying presentation slides with options for annotation and explanation, and facilitating distance training opportunities.

### **Types of Virtual Training Platforms**

A study by Birillo et al. (2024) identified the key types and classifications of virtual training platforms, categorising them as follows:

1. Based on use or purpose.
2. Open vs. closed virtual training platforms.
3. Privacy-based classification.
4. Content delivery method.
5. Payment method.

Based on these classifications, it is evident that one of the most prominent platform management applications used in the current research is Moodle. This system offers integrated management, is open-source, and allows for modification and expansion. Additionally, Moodle is free and accessible to all educational entities, whether institutions or individuals, making it a widely adopted tool in educational settings.

### *Artificial Intelligence Application*

AI technology is one of the latest innovations developed to motivate learners and enhance the learning process, making it more engaging, interesting, and effective. It also represents a novel method of training. Ma & Siau (2018) define AI as the ability of a machine to simulate human intelligence in performing tasks, processing information, making intelligent decisions, solving problems, and developing learning capabilities through environments that employ intelligence in learning. The current research defines AI-based systems as "computer-based educational systems with independent databases that simulate the human mind within virtual training platforms, helping English language teachers develop smart board skills."

### **Artificial Intelligence Interaction with the Virtual Training Platform**

AI applications are still designed to achieve pre-defined goals set by humans. Artificial intelligence systems are not standalone entities; rather, they are components of a larger system. This system perceives its environment through various sensors, processes the information it receives, makes optimal decisions, and takes action based on those decisions. It then adjusts the environment through various stimuli to ensure the system functions effectively and efficiently.

### **Artificial Intelligence Applications in virtual training platforms**

There are various techniques for AI applications. The digital and dynamic nature of AI offers opportunities in areas that traditional training environments cannot provide. Chen, Chen, & Lin (2020) identify several of the most widespread AI applications, which include:

- Expert systems applications.
- Natural language voice recognition applications.
- Machine vision.
- Modelling human performance.
- Planning and robotics.
- Augmented reality.

- Intelligent agents.
- Chatbots.

Expert systems applications and chatbots are among the AI technologies most closely integrated into the training process within virtual training platforms. These tools enable both trainers and trainees to make the training experience more engaging while improving the overall training outcomes.

### *The Smart Board*

There is no doubt that acquiring smart board usage skills is essential for teachers, as it is a key and effective tool in classroom teaching. Pourciau (2014) defined the smart board as a whiteboard operated by touch and pen, which is written on electronically. It can also display various applications from a computer screen. The current research defines the smart board as a sensitive white electronic display screen connected to a computer, used to present educational content and provide teachers with multiple options for explanation and clarification, thereby eliminating the need for other teaching tools. Many studies have highlighted the benefits of preparing teachers by equipping them with technological innovations, with the smart board being a key example. For instance, the study by Cattik & Odlyurt (2017) aimed to provide teachers with the necessary competencies, which was positively received by specialists in developing training programs for English language teachers. The study also sought to develop a training course plan for teachers in-service, focusing on the qualitative competencies needed and directing the attention of those responsible for teacher preparation in Egypt.

### **Educational Characteristics of the Interactive Whiteboard**

The smart board is considered one of the most essential educational tools for English language teachers. With the advancement of technology and modern discoveries, the traditional board has evolved into an interactive smart board with vast potential, various advantages, and characteristics, as highlighted in the study by Sad (2012). These include:

1. Providing teachers with sufficient time to write on the board, as lessons can be written in advance, allowing comments and notes to be added during the explanation.
2. Using the smart board keyboard to write and enter data.
3. Overcoming the difficulties associated with chalkboards.
4. Eliminating the need for students to transcribe what the teacher writes on the board, as the content can be printed, distributed to learners, or sent via email.

In alignment with this, Kirbas (2018) also mentioned that the key features of the smart board in the educational process include:

1. Helping to eliminate students' fear of technology, thereby motivating them to incorporate it into their lives.
2. Contributing to solving the problem of the shortage of experienced and competent teachers.
3. Allowing the recording of full lessons with the teacher's voice, which can be replayed in other classes or sent electronically to students.
4. Enabling the recording and control of video files, where the teacher can visually record everything written on the board, as well as capture audio in an AVI file.

### **The Importance of the Smart Board in the Educational Process**

Developing smart board usage skills has a profound and clear positive impact on the educational system, benefiting both teachers and learners through the recording and re-presentation of lessons. The study by Martin, Shaw, & Daughenbaugh (2014) aimed to determine the effectiveness of the smart board on teacher-learner interaction in the second basic stage, focusing on teaching reading, writing, and mathematics. The results of the study concluded that using the smart board captured students' attention and enhanced their effectiveness and participation in the educational process. Similarly, Bıçak (2019) explored the effect of smart board usage on secondary school students' participation and behaviour in educational tasks. The study found a statistically significant improvement in learners' behaviour and participation when the smart board was used. Based on these findings, the virtual training platform based on artificial intelligence technology was designed to develop smart board skills among English language teachers, aiming to improve their teaching methods and enhance the learning experience.

### *Previous Studies*

The integration of AI into English language learning has shown transformative potential in various aspects, particularly in teaching and learning. According to Ulfa (2023), AI creates individual learning pathways, employs game-based approaches, and implements automated assessments, all of which have significantly contributed to improving proficiency in the English language. AI offers learners personalised experiences through real-time feedback and intelligent tutoring systems, which enhance engagement and improve language skills globally. This innovation in education highlights the pivotal role of AI in revolutionising English language learning through adaptive and interactive approaches. AI and IoT technologies in developing a human-computer interaction training system for learning English are discussed by Zhang (2023). For this purpose, a smart classroom environment is established using games, animation, micro-videos, and online teaching platforms to demonstrate the dynamics and interaction involved

in the learning process. The integration of AI and IoT enhances teaching outcomes and promotes higher-quality English language education. More importantly, this smart classroom model holds significant potential to improve English learning, especially in China, by leveraging advanced human-computer interaction systems.

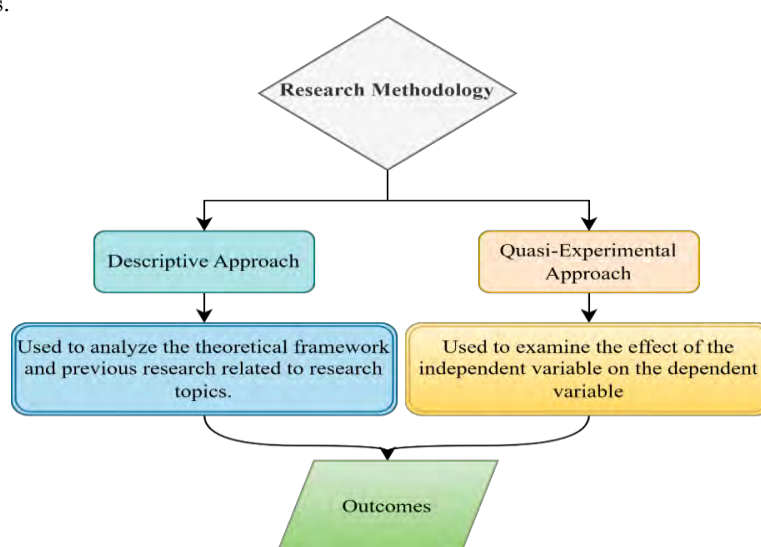
Additionally, the study by [Prakash et al. \(2024\)](#) explores advanced English language teaching using AI-based methods in dynamic classrooms. The research addresses the gap in both theoretical and practical approaches to language instruction by fostering cross-disciplinary cooperation among researchers, educators, technologists, and linguists. The innovative methodologies and empirical data used in this study effectively integrate AI into language acquisition, offering educators valuable insights into how such developments could support both teaching and learning. This cross-disciplinary focus emphasises the potential of AI in collaboratively reshaping traditional language teaching practices. Moreover, [Mohammadkarimi \(2024\)](#) discusses how AI can improve the development of English pronunciation through a mixed-method approach, considering both quantitative and qualitative data.

Some AI tools used in the study, such as Listnr and Murf AI, significantly enhanced pronunciation accuracy in learners within experimental groups. The results revealed positive attitudes from all learners towards AI-based tools, demonstrating the effective role that these tools play in addressing pronunciation difficulties. While numerous studies have examined the transformative potential of artificial intelligence and virtual training platforms in advancing various areas of education, several critical gaps remain. Recent research primarily focuses on the technical capabilities and some educational outcomes of AI-driven tools and platforms, such as improved cognitive skills, personalised learning trajectories, and increased teacher-student interactivity. However, limited attention has been given to the integration of AI in virtual training platforms explicitly designed to teach smartboard usage skills to practising and professional English language teachers. Although existing literature highlights the gains made through AI applications, such as gamification, automated feedback, and interactive systems, there is a lack of holistic frameworks to evaluate the cognitive and performance-based effects of AI-enhanced training on practical teaching tools like smart boards. Additionally, discussions around the scalability and long-term viability of AI in diverse educational contexts, such as in the UAE, are still developing and require further exploration.

This study addresses the gaps in the literature by examining the design and effectiveness of an AI-based virtual training platform specifically aimed at enhancing smart board usage skills among English language teachers. The research provides a comprehensive understanding of how AI can bridge the gap between technology and pedagogy, equipping teachers to meet the demands of modern educational environments. It achieves this through an evaluation of both cognitive and performance outcomes, assessing how AI-enhanced training can improve teachers' practical skills in using smart boards effectively.

## Methodology

The current study employs a structured methodology incorporating two distinct approaches, as illustrated in [Figure 1](#). The Descriptive Approach is used to analyse the theoretical framework and review previous research related to the topics under investigation. This approach provides an overview of the key theories and the contextual background. Additionally, the Quasi-Experimental Approach is utilised to measure the effects of the independent variable on the dependent variable. This approach not only facilitates the testing of hypotheses but also allows for the collection of empirical results, providing a foundation for the study's conclusions.



**Figure 1:** Research Methodology Framework.

### Research Procedures

This research was conducted through a structured process, following a sequence of activities aimed at achieving the desired outcomes, as shown in Figure 2. Initially, an intensive review of previously related studies, research works, and literature was carried out to analyse the variables connected with the subject of the research. Based on this review, a list of design criteria for the virtual training platform incorporating artificial intelligence was prepared. Following that, general and procedural objectives related to the development of smartboard skills were determined and examined by the researchers for confirmation and amendment. The research tools were then prepared and reviewed by a panel of experts to ensure their relevance and accuracy. The research design involved creating two virtual training platforms: one standard virtual training platform and the other incorporating artificial intelligence for experimental treatments. Measurement tools for the research variables were prepared, and their validity was checked by field experts. A research sample was selected and divided into two experimental groups. The research tools were applied a priori to the sample, followed by the implementation of the experimental treatments. The data collected underwent statistical analysis, and the findings were interpreted and discussed in detail. Finally, the study concluded with recommendations and proposals for future research.

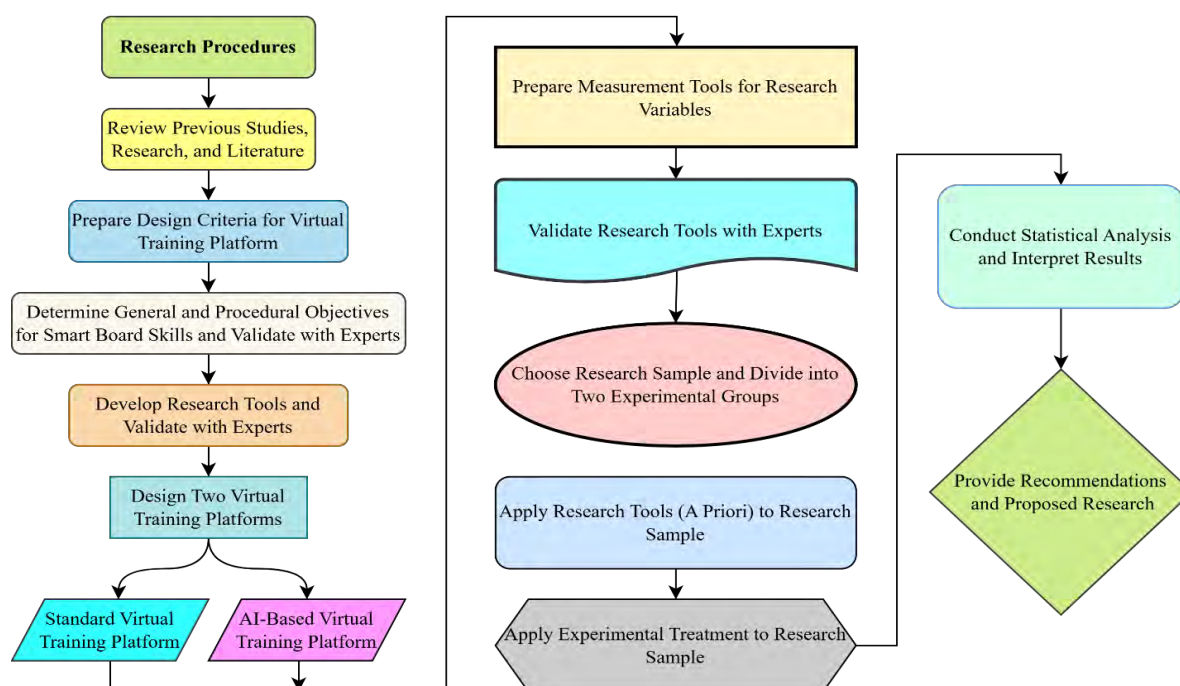


Figure 2: Research Procedures Flowchart.

### Choosing A Research Sample

The research followed a systematic approach to achieve its objectives, beginning with the selection of a research sample. A random sample of English language teachers in the UAE was chosen for the study.

### Experimental Framework

The research adopted a one-dimensional experimental design involving two experimental groups. The design focused on one independent variable presented in two modes, with pre- and post-measurements to evaluate its impact.

### Research Instruments

#### Achievement Test for Cognitive Aspects of Smart Board Usage Skills

In accordance with the established criteria, an achievement test was developed to assess the cognitive knowledge of participants regarding the use of smartboards in the experiment. The test, comprising 40 objective items, focuses on higher cognitive levels of knowledge. It includes 25 multiple-choice questions and 15 true/false items, each addressing various relevant aspects. To ensure validity, the instrument underwent expert evaluation to assess the clarity of the questions, the accuracy of the measurement statements, and the alignment of the instrument with the research objectives. Based on expert feedback, several items were revised for improved wording and coherence. The reliability of the test was determined using Cronbach's alpha, calculated with SPSS Version 25, based on a pilot sample of 10 participants. A reliability coefficient of 0.86 was obtained, indicating excellent reliability (see Table 1). Therefore, the test was deemed suitable for

use with the main research sample.

**Table 1: Reliability Coefficient of the Achievement Test.**

Reliability Coefficient	Sample Number	Test Items	Value
Cronbach's Alpha Coefficient	10	40	0.86

### Observation Checklist for Performance Aspects of Smart Board Usage Skills

An observation checklist was developed to assess participants' practical performance in using smartboards. The performance tasks were clearly defined, accompanied by detailed instructions, enabling evaluators to accurately gauge participants' performance levels. The checklist was validated by a panel of experts, who examined its clarity, sequencing, and alignment with the research objectives. Following their recommendations, several items were reworded, and the sequence of sub-skills was adjusted to enhance the checklist's effectiveness. To verify the reliability of the checklist, Cronbach's alpha was calculated using SPSS (Version 25) based on the post-application results from the pilot sample. The resulting coefficient of 0.89, as shown in Table 2, indicates a highly reliable and consistent measurement tool.

**Table 2: Results of Calculating the Checklist Reliability Coefficient ( $\alpha$ ).**

Stability Coefficient	Sample Number	Checklist Items	Value
Cronbach's Alpha Coefficient	10	138	0.89

### Designing a Virtual Training Platform Based on AI Techniques

The virtual training platform was developed employing artificial intelligence techniques to enhance participants' proficiency in using smartboards. The development followed a methodical five-stage process. During the analysis phase, the platform's needs and objectives were identified. The design phase involved planning the platform's structure and components. The production phase focused on integrating AI techniques to create an engaging and effective platform. In the evaluation phase, the platform was tested to verify its usability, efficiency, and alignment with the study's goals. The final implementation phase involved deploying the platform and disseminating it for research purposes.

#### Statistical Analysis

The data were analysed statistically to examine the research hypotheses. A t-test was employed to determine the significance of differences between the pre- and post-test results for both the achievement test and the observation checklist. All statistical analyses were conducted using SPSS (V.25) to ensure precision and reliability in the interpretation of the findings.

#### Summary of Research Tools

The research utilised two primary instruments to achieve its objectives: the achievement test and the observation checklist. The achievement test assessed the cognitive aspects of participants' proficiency in using smartboards, while the observation checklist evaluated their practical performance. Together with the virtual training platform, these tools established a comprehensive framework for assessing the effectiveness of the experimental treatment.

## Results

### Analysis and Interpretation of Research Questions and Hypotheses

The following section addresses the research questions, providing statistical analyses and interpretations of the results.

#### RQ1 What skills in using the smart board must English teachers have?

To address this research question, the researchers developed a comprehensive list of essential smartboard skills that English language teachers should acquire to enhance their teaching effectiveness. This list was reviewed by a panel of experts and specialists, and adjustments were made based on their feedback. The finalised list comprised three primary skills and 23 sub-skills. The main skills identified were:

- The skill of using the smartboard interface.
- The skill of using tools.
- The skill of dealing with objects.

#### RQ2 What are the necessary criteria to design a virtual training platform based on artificial intelligence technology to develop the skills of using the smart board among English language teachers?

To answer this question, the researchers created an initial list of design criteria for the virtual training platform. This list was reviewed by specialists, who provided feedback on its clarity and relevance. After integrating their suggestions, the finalised list comprised seven main criteria and 50 indicators. These criteria

formed the basis for designing the AI-based virtual training platform.

*RQ3 What is the proposed educational design for the virtual training platform based on artificial intelligence technology that is necessary to develop the skills of using the smart board among English language teachers?*

The virtual training platform was developed in accordance with a systematic model detailed in the research methodology. The design process involved sequential stages: analysis, design, production, evaluation, and implementation. Expert feedback was integrated throughout the process to refine and produce the final functional version of the platform.

The remaining research questions were addressed through an analysis of sample homogeneity and by testing the validity of the research hypotheses.

### *Testing the Validity of Hypotheses*

#### **Testing the First Hypothesis**

The first hypothesis stated: "There is no statistically significant difference at the level of (0.05) between the average scores of participants in the two experimental groups in the post-application of the cognitive achievement test." The study employed a t-test to evaluate this hypothesis. The results are presented in [Table 3](#). The calculated t-value (6.55) exceeded the tabulated t-value (1.67) at a significance level of 0.05, indicating a statistically significant difference in favour of the second experimental group. Consequently, the null hypothesis was rejected, and the alternative hypothesis was accepted, stating: "There is a statistically significant difference at the 0.05 level between the average scores of participants in the two experimental groups on the post-application of the cognitive achievement test, in favour of the second experimental group."

**Table 3:** *The T-Test Results for Comparing the Post-Test Mean Scores of the Two Groups of Students on the Achievement Test.*

Groups	Average	Standard Deviation	Degree of Freedom	"T" Value	Level Of Significance	Effect Size H <sup>2</sup>
First	35.60	2.52	58	6.55	significant at 0.05	0.48
Second	38.93	1.17				

#### **Testing the Second Hypothesis**

The second hypothesis stated: "There is no statistically significant difference at the 0.05 level between the average scores of the participants in the two experimental groups on the post-application of the checklist." The t-test results for this hypothesis are presented in [Table 4](#). The calculated t-value (4.60) exceeded the tabulated t-value (1.67) at a significance level of 0.05, indicating a statistically significant difference in favour of the second experimental group. Consequently, the second hypothesis was rejected, and the alternative hypothesis was accepted, stating: "There is a statistically significant difference at the 0.05 level between the average scores of the participants in the two experimental groups on the post-application of the checklist."

**Table 4:** *T-Test Results for Comparing the Post-Test Mean Scores of the Two Groups of Participants on the Observation Checklist.*

Groups	Average	Standard Deviation	Degree of Freedom	"T" Value	Level of Significance	Effect Size h <sup>2</sup>
First	267.40	4.97	58	4.60	Significant at 0.05	0.39
Second	272.16	2.73				

## **Discussion**

The researchers attribute the superior performance of learners in the second experimental group, which utilised the AI-powered virtual training platform, to the unique features and advantages offered by the platform. The platform delivers high-quality courses, educational materials, and training content via the Internet, ensuring accessibility and convenience for learners. Furthermore, the platform operates on the principle that all users should have the freedom to access, customise, enhance, and share its resources without restrictions. This approach is rooted in the principles of openness and the free dissemination of knowledge for the benefit of society. Through the use of artificial intelligence, these educational resources become available to all learners. Such inclusivity and adaptability align with the findings of previous studies ([Chen et al., 2020](#); [Chen et al., 2023](#); [Hevko, Siaonan, & Hongwei, 2023](#); [Ibrahim & Glushkov, 2024](#); [León Rodríguez & Viña Brito, 2017](#)), which highlight the transformative potential of AI-driven platforms in promoting knowledge sharing and improving learning outcomes.

## **Conclusion**

This research examined the effectiveness of an AI-based virtual training platform in enhancing

smartboard usage skills among English language teachers in national schools across the UAE. The findings highlighted several benefits of AI-driven learning tools, demonstrating their potential to positively impact both cognitive and practical competencies. The results indicated that the performance of the group using the AI-based platform significantly surpassed that of the group using a conventional training platform. This underscores the capabilities of the AI-based platform in providing high-quality, accessible, and flexible learning experiences.

### Research Limitations

The present research was confined to English language teachers in national schools within the UAE and centred on the development of smartboard usage skills. These parameters provided a specific context for evaluating the impact of the platform, yet they also highlight the need for further investigation in different educational settings and across other skill domains.

### Recommendations and Proposed Research

Based on the results, the authors offer several recommendations for better integrating and enhancing artificial intelligence in educational practice. First, there is a need for systematic design processes for AI applications that align with recognised standards for educational platforms. Second, organising targeted training courses for English language teachers on emerging technological innovations is essential to foster adaptability and improve teaching practices. Third, promoting a culture of smartboard usage across various levels of education will help ensure widespread adoption. Finally, establishing standardised guidelines for the application of AI in web-based educational platforms will maintain consistency in quality.

For future research, the following directions are proposed:

1. Investigate the impact of artificial intelligence applications on developing electronic assessment production skills among secondary school teachers.
2. Examine the influence of various design variables within training platforms on performance support outcomes.
3. Conduct further studies addressing the integration of artificial intelligence and augmented reality applications in educational environments.

This study highlights the transformative potential of AI in education, paving the way for more advanced and effective teaching tools that can adapt to the diverse needs of learners and educators. The proposed recommendations and research avenues aim to build upon these findings, further advancing the role of AI in fostering innovative educational practices.

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