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Global Perspectives on AI Usage in the Education Sector: Insights from the UAE Education System

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Abstract

Purpose: The purpose of this study is to explore the integration of Artificial Intelligence (AI) in the education sector, with a focus on global applications and insights from the UAE context.

Methodology: The study employed a qualitative research design, involving structured interviews with 15 educational experts across the UAE, complemented by a review of global AI trends.

Findings: Results indicate that AI transforms student performance and teaching quality by personalizing learning experiences and offering real-time feedback. However, challenges such as ethical considerations, infrastructure needs, and teacher training gaps remain prevalent.

Unique Contribution to Theory, Practice and Policy: Strategies for maximizing AI benefits include fostering public-private partnerships, teacher training frameworks, and establishing programs, ethical policy innovation centres.

Keywords: *Artificial Intelligence, UAE Education, Personalized Learning, Teaching Quality*

JEL Classification: *I20, I25*

INTRODUCTION

The United Arab Emirates (UAE) has emerged as a world leader in the adoption of artificial intelligence (AI), with a strong commitment to the adoption of AI in strategic sectors such as education. With the UAE's vision to become a world leader in AI by 2031, its education sector offers both unique opportunities and challenges in following the AI advancements in the region on a global scale. While AI-driven learning systems, adaptive education platforms, and automated assessment tools have gained popularity across the globe, the UAE must overcome unique challenges like cultural sensitivity, infrastructure readiness, and training teachers. In contrast to most Western countries with established AI education infrastructure, the UAE must integrate AI into a rich and diverse education system quickly while ensuring ethical usage, equity, and data security. UAE has a strategic advantage in AI adoption in the form of strong government backing, visionary policies, and a willingness to invest in advanced technologies. AI-driven tools like the Alef Education system have already revolutionized the classroom by offering adaptive learning experiences according to student requirements. Yet, AI continues to revolutionize education globally, and the UAE must benchmark international best practices, distill critical success factors, and transfer AI solutions that are appropriate to the country's specific educational aspirations (Alshamsi et al., 2024). This research study seeks to examine the global adoption of AI in different education sectors by examining its benefits and implementation strategies. Based on research into international AI trends in education, this research study will offer some insights into how the UAE can maximize its AI-led educational revolution while overcoming the special challenges presented by its education system.

Problem Statement

Artificial intelligence is revolutionizing in many sectors such as the education sector. Despite the huge spread of it, UAE education sector faced many challenges that need more attention to local exploration of AI integration. Globally, AI transform education by having platform, personalized learning and data driven teaching methods. However, gaps exist on how these technologies can be aligned with the needs of UAE education system. In addition, there is limited research on the impact of AI in long term manner on AI specifically student performance and teaching quality.

Gaps the Study Intends to Fill

1. **Teacher Readiness and training:** The study will go through the preparedness of the teachers to adopt the AI tools and will propose strategies to bridge the training gaps.

2. **Cultural and Ethical Consideration:** In UAE, AI integration in education is discussed widely while there is minimal discussion of how the cultural and ethical issues influence the adoption of AI.

3. **Localized Insights:** The aim of the study it to provide understanding on how the global AI trends can be adapted in UAE education sector. This addresses the lack of region research.

Beneficiaries of the Study

1. **Students:** Many educational tools and better personalized learning experience which improve the engagement, performance and motivation to prepare them for future careers.

2. **Educators and Teachers:** The study will help the teachers to enhance their quality of teaching by adopting many innovative practices to meet the needs of the students.

3. **Educational Institutions:** universities and schools can use AI technologies and ensure the alignment with best practices globally.

4. **Parents:** the study will help the parents to know how these tools benefit their children in learning journey.

This study aims to foster innovation specially in education sector in UAE, to position our country as a leader in AI driven education by 2031.

Scope

As the UAE is progressing towards greater acceptance and optimism towards the advancement of Artificial Intelligence (AI) within its educational field, it is necessary to consider global applications of AI within education sectors. The scope of this research focuses on exploring global applications of AI in education and how these can inform the UAE's efforts to implement AI technologies effectively within its educational sector. To refine this, the study aims to address specific objectives, including: (1) examining how AI impacts student performance and teaching quality in different global contexts; (2) identifying the challenges and opportunities of AI integration specific to the UAE's cultural and infrastructural landscape; (3) analyzing existing AI-driven educational tools and their adaptability to the UAE's education system; and (4) providing actionable recommendations for educator and institutions to maximize the benefits of AI in education. These precise objectives clarify the study's intent to bridge global insights with local implementation strategies.

LITERATURE REVIEW

In recent years, Artificial Intelligence has become one of the promising technologies to improve the education sector across the world. This continuous development for the technology is to satisfy the needs of the education sector to find the best ways to raise the education level and make it more efficient and effective.

In this literature review, we will critically analyze and review different articles studied regarding the AI usage within education sector, and AI implementation globally and within UAE. This in return will help in determining the value of the two variables this paper aims to focus upon: student performance and teaching quality.

Hypothesis

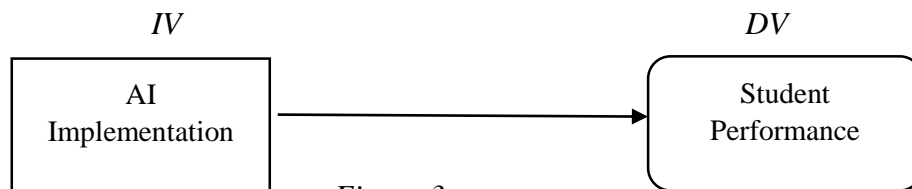**H₁.** *Implementing AI technologies will lead to higher student performance.*

Figure 3

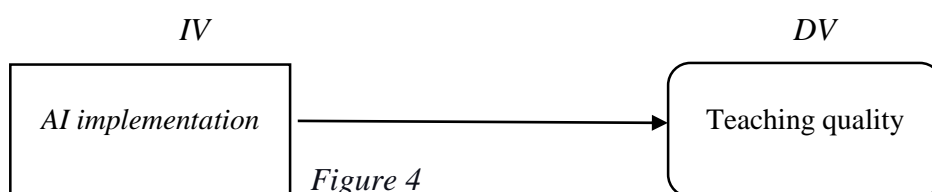**H₂.** *Implementing AI technologies will lead to higher teaching quality.*

Figure 4

Theoretical Framework

According to Figure 3, it describes the dependent and independent variables. The student performance is the dependent variable that depends on the AI implementation which is an independent variable. In figure 4, The AI implementation practices is the independent variable that influence on the teaching quality.
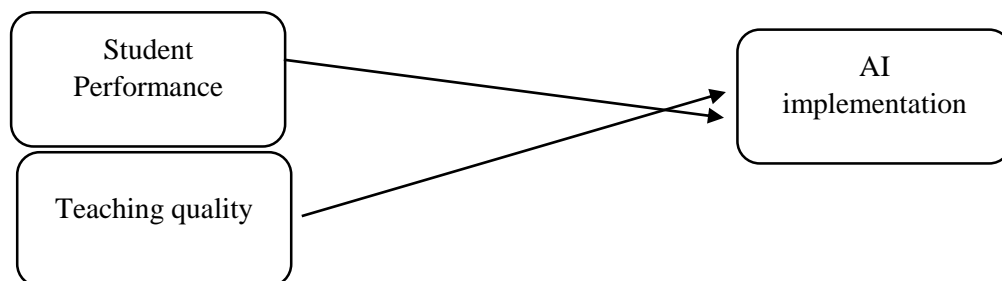
AI Usage within the Education Sector

With the introduction of artificial intelligence into the education field, it certainly has become one of the biggest influences that would change the modus operandi of learning, educating, and teaching in a school. In this regard, Kamalov et al. (2023) discuss integrating AI technologies within the education framework to improve productive learning outcomes such as personalized learning, intelligent tutoring systems, and assessment automation.

The gains are not limited to the more traditional academic and educational settings. Such developments also occur in vocational training and lifelong learning programs. For instance, AI-based training programs have been included in workforce development to better improve skills acquisition in technical areas. In China, an international AI Training Program at Peking University trained 500 teachers and 5,000 students on AI technologies. The program enabled professionals to equip themselves with crucial skills required by the changing nature of the job market (UNESCO, 2019). Similarly, India's "AI for All" initiative offers a self-paced AI

literacy course that is available to all levels of people so that lifelong learners and professionals can adapt to AI-driven transformations (Bhutoria, 2022).

In the UAE, AI-based vocational training initiatives like the KHDA AI Lab with IBM seek to integrate AI tools into the upskilling efforts. It has been possible for working professionals and vocational learners to interact more effectively with AI-driven decision-making tools and, thus, with technical competencies. AI-based language learning apps like Memrise have also garnered huge success for their ability to facilitate language learning in adult working professionals through pathways that are individually adapted and learner-paced (AI Startups Organization, 2024).

AI-based robotics education is also introduced into non-academic settings to facilitate coding and technical training. An example of the use of AI-driven robot learning platform in Poland was successfully implemented in teaching children programming languages using an interactive story-based learning system (University of Silesia, 2023). The use of such AI-powered learning is very effective in lifelong education, where individuals look to reskill or upskill in a technology-driven career.

Therefore, AI's role in education extends beyond traditional classrooms, impacting vocational training, workforce development, and lifelong learning. Understanding AI applications in education worldwide across both academic and professional learning contexts is essential to evaluating how countries, including the UAE, are adapting to this new wave of technological transformation.

AI Implementation in the Context of Global Education Sectors

The United States

AI within educational sectors in the United States plays an evidential role in affecting a student's learning position and habits. Attaran et al. (2018) explore the implementation of AI within universities in the US, specifically in matters concerning students' educational performance. One significant outcome of AI adoption in higher education is the use of early-warning systems, also known as dropout prevention systems, which identify students at risk of academic failure due to poor study habits (Simhardi & Swamy, 2023). Such AI-driven systems have been successfully implemented at Georgia State University and Purdue University, where predictive analytics help faculty intervene with at-risk students. At Georgia State, the AI-powered advising system, which tracks over 800 different risk factors, has led to an 18% increase in student retention rates since its implementation (Hao, 2019). Similarly, Purdue University's Course Signals system provides real-time feedback to students about their academic standing, increasing engagement and boosting retention rates by 21% over several semesters. Beyond traditional higher education, AI has also played a transformative role in vocational training and workforce development. A case study on Age of Learning Inc. in the US highlights how AI-driven interactive entertainment fosters personalized learning, improving retention and engagement among young learners. This approach was introduced in response to the shortcomings of traditional education, where students often struggle with motivation and knowledge retention. By integrating AI-powered educational games and personalized lesson plans, Age of Learning Inc. has demonstrated a significant improvement in students' academic performance and engagement levels. These cases exemplify how AI-driven tools enhance student motivation and involvement, offering just-in-time feedback mechanisms that enable better learning outcomes. The integration of predictive analytics,

personalized tutoring, and interactive learning platforms underscores AI's potential to reshape education, leading to higher retention rates and improved student success.

China

In the process of China's development toward becoming an international player in the realm of AI, Yang (2019) reviews an accelerated pace of AI education in China in which the State Council of China worked on the next generation of Artificial Intelligence development plans. Such paper emphasizes the fact that China must capitalize on the various dimensions presented by the rise of AI and work towards making it an innovation powerhouse (State Council of China, 2017). Further, high schools in China have incorporated an "AI" course under the IT curriculum that will enable students to be familiarized with the term and understand the history of its development. This has also been observed in the higher educational levels in AI education, since China has come up with 32 colleges of AI and worked upon integrating the concept of AI with different majors of universities at the level of mathematics, computer science, as well as psychology (Yang, 2019). Moreover, Chinese tech companies are also on the move towards enhancing the use of AI to support the building of an educational system based on the establishment of a "Smart Campus" school and promotion of the application of AI in mathematics and resource development (MOE, 2018). This aligns with the vision China has envisioned for itself and that is centered on becoming an AI leader by the year 2023 (Bhutoria, 2022). An international AI training program is also initiated at Peking University in 2018, which aims to train 500 teachers and 5000 students on AI technologies (UNESCO, 2019). As of 2025, China has made significant plans to enhance towards AI development in alliance with their 2023 goal, through great progress within their education sector. This is persistently evident under their "Made in China 2025" initiative, where it strives towards positioning itself a leading powerhouse in the technology sector. However, one must not forget the certain gaps and challenges that may arise along the way, such as the international trade laws and restrictions that may implicate the procedures of developing high end AI applications, along with the social and ethical considerations that one must not disregard when developing such technologies.

India

Bhutoria (2022) discusses India's application of AI within its education sector, through its introduction of a program that encompasses all individuals under the name "AI for All." Such national policy includes a self-paced 4-hour learning program that discovers the essence of AI, showing how Asian Ed Techs countries are also on the move towards incorporating AI within their educational systems (Horn & Staker, 2016). The National Institution for Transforming India (NITI) has also worked on implementing a strategy towards the move of implementing AI within education sectors as such application will aid in identifying market trends and dynamics. Doing so, research has shown that India's implementation of data-mining-based learning tools have proven to be a success for students' learning capabilities (Karthikeyan & Sujitha, 2020). As India AI strategy in education has focused on integration with the national education polices like accessibility and scalability for large population. Unlike China, as it concentrates on creation of "smart campuses", high tech infrastructure, India concentrates on broad reaching solution and cost effective such as AI based tools for personalized learning to improve student's outcomes. In general, USA invests on early warning systems, tailored solutions within well-funded institutions and AI tools for individual student assessments. While India's prioritizes nationwide impact, its realiance on self-paced learning program like "AI for

All" course contracts with the U.S and China, which focus on advanced applications like adaptive learning frameworks and institutional integration of AI.

AI Implementation in the Context of UAE's Education Sector

With the world getting ready for the Fourth Industrial Revolution, artificial intelligence (AI) has brought about revolutionary change, most prominently in education. Alhamuddin et al. (2022) talk of how AI is revolutionizing education systems by preparing students for future jobs and as-yet-unknown technologies. In response, the UAE started its AI strategy in 2017 to drive AI growth and investment in key sectors, including education (UAE Centennial 2071, 2018). The Adaptive Learning Framework (ALEF) is one of the most important initiatives of this strategy that uses AI to offer customized learning experiences, assessing students' strengths and weaknesses and offering real-time feedback loops to parents and educators (Alyammahi, 2019).

The ALEF program has been a measurable success. A research study by the Emirates Schools Establishment determined that the program significantly increased students' motivation and engagement. Parent surveys recorded a satisfaction rate of 78%, with many appreciating the ease of monitoring the progress of their children through weekly reports and real-time performance data (Emara, Ali, & Abu Khurma, 2023). Teachers using ALEF have also seen their teaching efficiency enhanced through AI-provided insights that allow lesson plans to be adjusted to individual students' needs (Emara, Ali, & Abu Khurma, 2023). Areas of improvement continue to exist, such as heavier assignment workload and question difficulty as areas of improvement. A preview of ALEF's program has demonstrated great success through over 1.1 million students being registered under the program. Research has shown that students that utilize the Alef program in Abu Dhabi have achieved 12.1% more growth than those that do not use it. As such, students utilize the Alef program for 45 minutes averaged per day (Alef Education, 2025).

Apart from ALEF, the UAE has also implemented a state-of-the-art Education Management Information System (EMIS), supporting 1,200 schools and over 70 institutions of higher learning. The system collates data on curricula, teacher professional development, student performance, and international assessment scores, offering a firm foundation for AI-based decision-making (UNESCO, 2019).

The deployment of ChatGPT to UAE's education system further fueled discussions regarding the application of AI in education. Its effect is yet to be tested, but initial case studies indicate spectacular improvements. For instance, a study on the application of ChatGPT in journalism education at Tajik National University revealed improved critical thinking and writing abilities in students. Students indicated improved idea generation and more efficient research capabilities to improve academic performance (Cetinkaya, 2017). Educators in UAE institutions have started applying ChatGPT for automating administrative work, assisting students in generating content, and providing personalized learning paths (Khurma, Ali, & Hashem, 2023). Concerns, however, still exist regarding equity in access and the need for strong governance to manage AI adoption in classrooms (Khurma et al., 2023). Moreover, a case study conducted in an American curriculum school in the UAE explored the idea of ChatGPT substituting the classroom teacher in teaching Grade 11 stduents the subject chemistry. This looked upon understanding the effect and responsiveness of Chat GPT in allowing students to become more engaged and receptive. Such case revealed that although ChatGPT demonstrated strength in factors such as knowledge recall and reasoning skills,

negatives arised such as student full engagement and completing specific tasks (Ghazali, 2024)..

AI Impact in Education Sector

The adoption of artificial intelligence in the education sector has gained a lot of interest due to its potential to transfer the learning process and teaching completely. There are many ways in which AI can impact education. According to some articles that have been analyzed, in this part we will go through how AI impact in learning and educating (Chassignol et al., 2018; Bakhromovich, 2020).

AI in Learning

AI has huge impact on student's learning experience. According to Pokrivcakova, using intelligent systems like VR (Virtual Reality) which are part of AI, has proved that there is huge positive impact on the achievement of the students. In addition, Natsis and Mikropolous pointed that using AI tools and methods help students to have better learning experience which raise the quality of their education. Furthermore, In the article they mentioned that latest technologies like 3D and VR can enhance students learning experience by giving them enjoyment and learning at the same time (S. Raj, 2019; Celik et al., 2022). Some studies have concentrated on platforms which are web based. According to Kahrman, using AI for filtering information, monitoring the classes, and collaborative learning motivate the students to interact within the class and collaborate with each other. In other studies, it was mentioned that the web platforms have benefits same as brick and mortar as it adjusts tailor instruction that the learner need (Khare et al., 2018; Zakirova & Zunnunova, 2020). As mentioned above about web-based AI, it has proved that it has improved the learning experience and made it more enjoyable (Chaudhry & Kazim, 2021).

In the UAE, AI is used as a platform for learning in universities and schools to have better learning experience. This platform helps the students to have better engagement, better academic achievement, and more motivation. In addition, some other AI tools are used for analyzing the data of the students like the learning pattern, the amount of student's data, and the outcomes.

AI in Educating

Many studies have mentioned that AI has great influence on teaching and educational objectives (Steinbauer et al., 2021). First, AI has raised the level of the work for the instructor. This can happen through using plagiarism detectors and monitoring the activities of the students by using online platforms like Turnitin and Grammarly (J. Kim et al., 2022). Furthermore, some research have talked about the role of simulation and team viewer application in improving the educational quality. Second, in some studies it was mentioned that Individualized Student Training (ITS) use practices like evidence based which uses some learning models to deliver the best learning method to students. Some applications like AutoTutor and DeepTutor let the students to create the content that meets their interests (Kandlhofer & Steinbauer, 2021; Fernández-Martínez et al., 2021). Finally, some research talked about how AI robots can chat and talk, and this increase the student involvement and improve the quality of instruction. (Seo et al., 2021). While in the United Arab Emirates, teachers use AI tools in the classroom to enhance the teaching experience and make it more effective.

Case Brief

Case A. This case demonstrates how two leading education-based companies, Yuanfudao and Zuoyebang, implement a Narrow AI and tagging tools that offers a personalized learning experience for students in China. This is done through personalized learning plans, algorithm recommendations along with online tutoring. As depicted by traditional methods of teaching, it fails to recognize student's strengths and weaknesses effectively, thereby providing a minimized personal learning experience that aims to tackle students' challenges. Therefore, to work on minimizing the issue of not delivering quality education, the application of Narrow AI helped create a specialized learning plan, free online services to help practice exam databases, personalized performance analysis report, along with AI homework tutors that helped cater students' needs and difficulties. Thus, the outcomes portray a positive result in describing how the implementation of AI driven solutions within a student's learning experience leads to a more effective, quality-based, and personalized learning experience that gives students the chance to excel within their studies.

Case B. Amira Learning is an education technology company that uses AI-driven solutions to make improvements to the reading comprehension of young readers in the United States. Traditional teaching methods have been found wanting because these methods usually fail to assees individual reading abilities, and many young learners require focused support. To this end, Amira Learning has developed a personalized reading platform tailored to the instructional needs of each student. The system is constantly monitoring the reading skill of a learner and offering customized tasks and real-time feedback to him. In fact, an example of this was recently a pilot study in which 200 elementary students utilized the Amira Learning platform with results showing improvements of 28% on reading comprehension scores and 22% in reading fluency over an academic year. Educators further highlighted that the platform not only increases student engagement but also encourages the love for reading through immediate coaching and adaptive learning experiences. As Amira Learning addresses the flaws of traditional approaches with its AI-driven personalized approach, it has effectively improved performance among students and transformed reading education for young learners.

Case C. From the introduction of AI into journalism training at the Tajik National University, an age-old problem with traditional writing instruction has been effectively tackled. Formerly, journalism students would find it hard to come up with creative ideas, build on their ideas, and produce articles in a logical sequence. This would, in turn, create low grades and little room for critical thinking. In order to deal with these problems faced by journalism students, AI integration was made with curriculum development at Tajik National University by opening up possibilities for ChatGPT as an all-encompassing resource to advance journalistic writing. Using ChatGPT was taught for brainstorming-in generating topic ideas and outlining, for drafting-in overcoming writer's block and generating initial text drafts, and for editing-in getting timely suggestions for opinions about the weightiness of grammar versus coherence and style. This contained use of ChatGPT not only reached an improvement in individual writing activities but created an atmosphere for collaborative learning, where students shared their approaches and gave peer feedback based on suggestions generated by AI. Due to this, the writing capabilities of hesitant writers improved measurably upward, seeing improved marks for their journalism classes, and increasing interest in creative and critical participation. In all, the integration of AI literacy and ChatGPT into the curriculum proved the potential of technology to transform traditional writing instruction and vastly increase educational outcomes in journalism.

Case D. Memrise is a technological company leading in education based in the UK. It has employed machine learning to customize lesson plans to the needs of the students. Memrise provides a personalized learning experience that adjusts to each learner's individual progress and preferences via using sophisticated algorithms. They saw an opportunity when assessing the traditional educational approaches, which relies on one-size lesson programs to fit all, which did not adequately accommodate each learner's individual preferences and pace and lead to students struggling with the curriculum, thus falling back due to lack of personalization. Addressing those challenges, Memrise have integrated machine learning into its platform to modify lesson activities according to the student's needs. The platform provides personalized pace and content based on an assessment of each learner's learning style and progress, to receive support overcome challenges, which demonstrated positive outcomes in improving students' educational experiences skills, and performance. Memrise utilized machine learning to personalize lesson plans for learners, successfully addressing student's needs that were failed by the traditional teaching approached, thus enhancing student's performance and satisfaction.

Case E. Implementation of UAE education using the Alef program has revolutionized parental involvement by addressing the past lack of timely feedback on the performance of students. The adaptive learning program provides parents with a dedicated mobile app and online portal, offering immediate information about the academic performance of the child. Parents are given detailed weekly reports through the app and portal, outlining achievements, areas needing improvement, and recommending actionable tips such as personalized practice exercises or suggestions for additional tutoring. For instance, the portal displays analytics on test scores, submission of assignments, and participation in class, allowing parents to know which subjects their children may need extra tutoring. The app also offers push notifications on upcoming assessments and personalized learning activities, keeping parents constantly informed. By integrating these detailed feedback tools, the Alef program not only enhances student participation and performance but also fosters a more supportive and encouraging learning environment, contributing to higher parental satisfaction and active participation in the child's learning process.

Case F. Age of Learning Inc. is a US-based education technology company that leverages AI-driven interactive entertainment to create personalized learning environments for young learners. By combining AI technology with engaging educational content, they keep students motivated to enhance their learning experience. This approach was introduced due to the failure of traditional methods to fully engage students, resulting in a lack of personalized learning opportunities, thus decreased motivation, which can hinder learner's progress as well as limiting their potential. Tackling this issue, Age of Learning Inc. used AI-driven interactive entertainment to adapt educational content to each learner's preferences and learning model. Using a platform that provides dynamic activities and personalized learning that adhere to learner's progress in a timely manner. Age of Learning Inc. created a customized and engaging learning experience for each learner, to become more enthusiastic and motivated about their studies fostered a love for learning, which led to increased rates of student engagement and improved student's performance.

Case G. Poland is one of the countries that are pioneer in the adoption of AI technologies specially in the education sector. One of the issues that became a suffer by the students in this case study is learning programming as it's a difficult subject to understand mainly with the traditional way of learning. As a solution for this issue, Robots has been adopted in the schools. These robots are controlled by mobile application and have been programmed by the students

with the help of teachers. This adoption of this type of robots has helped the students to learn programming and develop their abilities and skills in this subject. This case shows how AI technology has made a huge difference in teaching the students and raising their level in education.

Case Demonstration

This section demonstrates cases of the manner in which companies have integrated AI in learning to shape learning outcomes. It also stipulates the motivations for the adoption of AI-driven tools in education to offer a better understanding of their growing popularity.

Case	Demonstration	Motivation to adopt AI in education
Case A: A Case Study on The Application of Artificial Intelligence in Education Industry-China **Yuanfudao and Zuyebang, China**	Two prominent pioneers within the education field in China, Yuanfudao and Zuyebang, have achieved success through the implementation of Narrow AI within their online educational platforms. This is through creating a personalized feature that allows students to experience an enhanced learning journey through the usage of AI features such as personalized learning plans by including recommendation algorithms. This is navigated through collecting exam questions and working upon a comprehensive database, followed by the provision of free online services depicted on the revision and searching of past exam questions. Such implementation aligns with the hypothesis agreement proposed that suggests AI implementation leads to higher student performance.	• Attend to the various and different educational needs proposed by students to ensure learning effectiveness. • Provide a personalized and customized learning plan that enhances student engagement, gives support, and improves their learning outcomes. • Identify the student's underperformance and plan ways to overcome their areas of weakness. • Make quality education accessible and effective for learners.
Case B: The use of AI to accelerate young learners' reading comprehension. **Amira Learning, California, United States**	AI can create virtual learning applications that can pinpoint the strengths and limitations of learners to inform curriculum development and learning activities. This approach supports the hypothesis proposed stating that adopting	• To provide services such as student progress card to track areas of improvement. • To create virtual learning environments that allow students to read aloud while allowing teachers

	AI can lead to improved student performance.	to assess their reading fluency.
Case C: A Case Study on applications of AI literacy and ChatGPT-3 in enhancing critical reasoning and journalistic writing competencies among 50 third-term journalism students at Tajik National University **Tajik National University, Taijkistan**	The Tajik National University has adopted AI utilities such as ChatGPT-3 and other AI utilities in journalism to see the progress and development of the student skills. This integration of the AI tools has been implemented in the classroom of 50 student journalism. The aim was to check if these utilities can help the students to improve their writing skills. Both qualitative and quantitative data were collected from students after applying AI in their class. The qualitative data collected was for summarizing their scores and critical thinking after applying ChatGPT-3. For qualitative data some interviews were held to get the feedback after the application of ChatGPT-3.	• Help in generating ideas and give exclusive suggestions to help in improving the writing quality. • Increase collaboration between students by encouraging working in teams togethers, peer learning and writing the assignments together through AI tools. • Improve the skills of the students and motivate them to innovate by increasing their critical thinking and deeper analysis which will be reflected on their handwriting.
Case D: Using Machine Learning to Adapt Learners' Needs to Lesson Activities. **Memrise, United Kingdom**	AI and machine learning data can support the creation of language-learning app capable of meeting students' needs while tracking their progress. This aligns with the hypothesis proposed that adopting AI will lead to enhanced student's outcomes.	• To develop language-learning apps. • To create lesson plans and activities consistent with learners' needs.
Case E: Adaptive Learning Framework (Alef) in UAE Public Schools from the Parents' Perspective **Emirates Schools Establishment, United Arab Emirates**	With the introduction of an AI strategy in 2017, the UAE government has been a pioneer in developing initiatives that support the implementation of AI in the educational field. Through the Alef program, it has provided students with a personalized learning experience that help identify their educational strengths and weaknesses. Such coordinates with the notion that by	• To enhance and invest in the performance of the educational sector as part of the UAE's AI strategy. • To drive innovation and motivation for students to excel and engage under the Alef program.

	implementing AI within the education sector, it will lead to higher student performance.	
Case F: Use of AI-driven Interactive Entertainment to Create Engaging and Personalized Learning Environments. **Age of Learning Inc. United States**	AI-driven tools can create interactive or iterative learning environments that provide personalized classroom settings and curriculums for improving students' skills, which supports the proposed hypothesis stating that implementing AI in education will lead to better student achievement.	• To provide reading and mathematics classroom ideal for classroom settings. • To create interactive and iterative learning environments to improve learning outcomes.
Case G: Use Educational Robots in Education and Examines the Level of Preparation and Motivation of Children and Pupils. **University of Silesia, Poland**	A photon robot (AI) that has been developed for children for all the ages. It has been connected with a mobile application. This robot service the children in all the stages and it develop their abilities and perception abilities. Also, it helps them to learn the basics of programming and other foreign language.	• To develop the abilities of the children and support them in all their stages of development. • To Teach them the basics of programming and any other foreign languages.

Case Assessment

This section addresses issues that characterize learning as well as the solutions or complications initiated by AI technologies.

Case	Problem	AI-Driven Solutions
Case A: A Case Study on The Application of Artificial Intelligence in Education Industry- China **Yuanfudao and Zuyebang, China**	When it comes to traditional educational methods, students embark on the challenge of failing to recognize their strengths and weaknesses through the knowledge taught in school along with the time allocated to getting better at these weaknesses at a limited time to improve their grades. Therefore, traditional methods lack learning personalization plans and face problems when delivering quality education.	Apply a Narrow AI method that works upon a specialized learning plans through implementing recommendation algorithms. • Delivery of free online services to practice past exam database. • Provision of a personalized learning performance analysis report. • Yuanfudao's platform provides personalized online courses, AI homework tutors and a learning experience that caters the student's needs. • Zuoyebang's platform offers one-to-one tutoring in courses such as English, Mathematics, and Physics) _ {Figure 1}
Case B: The use of AI to Accelerate Young Learners' Reading Comprehension. **Amira Learning, California, United States**	Reading comprehension arise from different reasons. The available traditional teaching methods lack practical mechanisms for tracking students' reading progress and fluency. Traditional learning is also characterized by limited vocabulary, which slows reading comprehension.	• Providing virtual learning environments where students can read stories aloud and teachers can assess oral reading fluency. • Providing real-time student progress card to allow educators to track reading comprehension.
Case C: A Case Study on Applications of AI Literacy and ChatGPT-3 in	The standard way of writing with the journalism students in the country of Tajikistan limited their thinking and	• The tool provides many search options and help the students for better analysis and critical

Enhancing Critical Reasoning and Journalistic Writing Competencies among 50 Third-term Journalism Students at Tajik National University. **Tajik National University, Tajikistan**	innovation and made many challenges for them in their writing. Also, it was difficult for them to come up with concepts for writing and they were having low writing capabilities. As a result, Tajikistan country adopted AI technologies to raise the capabilities of the students and see the positive impact of these technologies on the study on the country.	thinking specially in writing. • The AI tools helped the student to work in groups like solving assignments together, collaborating with each, sharing ideas and increase their performance of writing.
Case D: Using Machine Learning to Adapt Learners' Needs to Lesson Activities. **Memrise, United Kingdom**	In the conventional learning contexts, most lessons and lesson activities are not aligned with the needs of learners. Similarly, lessons are rigid, increasing the difficulties in integrating technology tools to align them with student needs.	• Developing learning apps, including language learning app, to foster language development of learners. • To utilize predictive analytics from machine learning to adapt students' needs to lesson activities.
Case E: Adaptive Learning Framework (Alef) in UAE Public Schools from the Parents' Perspective **Emirates Schools Establishment, United Arab Emirates**	Within traditional learning methods, students have faced limited feedback and monitoring of their progress, which has created an educational approach not catered to the student's needs and learning capabilities. This limits the chance to create and allow the student to engage in an environment that fosters educational excellence.	• The Alef program provides an immediate feedback platform that allows students and parents to monitor the child's educational progress. • Alef provides a personalized learning path that is tailored to the student's specific needs and is customized to its preferences.
Case F: Use of AI-driven Interactive Entertainment to Create Engaging and Personalized Learning Environments. **Age of Learning Inc. United States**	Pre-K to 2nd grade students is struggling to develop mathematics and reading competency since traditional learning methods are ill equipped to foster foundational literacy. Similarly, they have failed to integrate game-based	• Creation of engaging and personalized learning aligned with students' needs. • Utilizing interactive entertainment to increase students' motivation towards learning.

	learning scenarios to improve learning outcomes.	
Case G: Use Educational Robots in Education and Examines The Level of Preparation and Motivation of Children and Pupils. **University of Silesia, Poland**	With the traditional way of learning programming language, it was very difficult for the children to learn fast and to understand the concept of programming fast. Also, the other foreign languages many difficulties were faced by the children in all the ages.	• AI based robot that help the children in learning programming and in logical thinking. • Sensors are provided to the robot to help it to react with the external environment.

Case Analysis

Case A. The use of personalized AI learning experiences, recommendation algorithms and personalized student plans help place Yuanfudao and Zuoyebang as top factors in revolutionizing the education sector within China. The implementation of AI technologies aids in the delivery of quality education and allows students to overcome their points of weakness in learning materials that traditional education approach may fail to accomplish. Through the establishment of AI algorithms within the education sector, students in China will become better engaged and help achieve their learning objectives. This reiterates with the hypothesis proposed, which provides the notion that implementing AI technologies leads to higher student performance. Despite the limitation in the amount of case samples presented, both Yuanfudao and Zuoyebang reiterate on the importance of introducing AI usage within China's education sectors, which in return will help meet student's needs, ensure the delivery of quality education, and lead the way in offering a personalized and efficient learning methods that allow students to excel in the future.

Case B. AI-driven tools are automating learning programs to improve reading comprehension. For example, Amira Learning is developing virtual learning application capable of automating feedback and lesson planning to improve comprehension of students (AI Startups Organization, 2024). Thus, it is integrating automation tools to support intelligent tutoring and generate samples that inform learning and developing reading comprehension skills.

Case C. The AI tools that have been used in Tajik university helped the journalism students to develop their writing skills specifically by using ChatGPT-3 which increased their thinking and gave them many options for searching and exploring best ways of writing journalism. Furthermore, empowering ChatGPT-3 in the studies of the student reflected a massive development in generating ideas and allowing the students to innovate more. The results of using the AI literacy have underlined the importance of using these latest technologies in not only education but also all the other fields which can ease the life of the human. However, some students may refuse using the tool which may limit improving their skills.

Case D. AI technologies are introducing adaptive learning to support student-centered learning and meet the needs of learners. For example, Memrise is utilizing insights from machine learning data and predictive analytics to develop learning apps capable of anticipating students' needs and meeting them (AI Startups Organization, 2024). This implies that they can generate samples and examples that align with students' expectations and capabilities to improve learning outcomes.

Case E. The application of Alef program into student's educational experience has reflected a positive viewpoint from the parent's perspective, as they have access to an educational program that monitors their child's educational strengths and weaknesses. Students are further engaged with immediate feedback mechanisms that encourage them to become motivated within their learning capabilities. The overall positive perspective addressed by the students' parents demonstrate how they are more aware of their child's education performance, as their child is able to target areas of educational weaknesses. Thus, the implementation of Alef program into educational sectors has witnessed a higher teaching quality, which comes in alliance with the hypothesis proposed. Despite the benefits offered, parents still reveal that there may be certain challenges exposed to the Alef program such as questions difficulty and great number of assignments.

Case F. AI is introducing new forms of interaction to nurture foundational literacy and improve language and mathematics skills of learners. As such, Age of Learning Inc. has introduced educational games, intelligent tutoring systems, and individualized support for learners through the interactive games as well as the engaging and personalized learning paths it uses to support skills development of students (Schoer, 2024). Thus, it has created AI-driven entertainment interactive tools that utilize games and personalized learning to create at-home and classroom learning scenarios to improve students' competency.

Case G. AI based robot that is developed to help the children learning programming language. The tasks and the experiments of the robot are story based on the mobile application that control the robot. This robot is built from scratch, and it progress same as the child progress. This robot helped the children to learn programming in very interesting manner and motivate them to learn programming fast. The research analysis showed that knowledge that is gained from the robot during the classes is valuable and beneficial for the children.

Case Judgment

By analyzing the Seven case studies on the use of AI technologies in learning institutions, findings can be categorized into three outcomes. The cases selected demonstrate how individualized support for students, AI-driven interactive games, adaptive educational platforms, virtual learning environments, and how machine learning are shaping how AI tools are used in learning.

Individualized Support for Students

Case A emphasizes the importance of two of China's top online educational platforms Yuanfudao and Zuoyebang in offering high-quality education by leveraging the power of Narrow AI. The platforms apply sophisticated recommendation algorithms and one-to-one tutoring systems to develop customized learning experiences targeting individual student vulnerabilities. Tang (2023) points out that the provision of tailored learning plans, combined with AI-created homework tutoring and interactive online classes, is key to transforming students' learning experiences toward higher academic quality. Nevertheless, while the two examples clearly demonstrate the potential of AI-driven education, the narrow nature of the focus restricts the applicability of the findings. Broadening the investigation to involve a wider sample ideally data from at least 10 various educational platforms from different global regions like North America, Europe, and developing markets in Asia would increase the robustness of the conclusions. Such sample diversity in size and context would ascertain whether the positive results seen in China are replicable under different socioeconomic and learning environments.

In addition, Cases D and F add greater insight by showing how AI uses machine learning to gather data on students' interests and learning patterns. This data is then translated into adaptive tools and educational games providing individualized learning routes, ensuring the content is tailored to each learner's expectations (AI Startups Organization, 2024). These instances highlight that while the existing evidence is encouraging, the inclusion of more international cases and a larger, more diversified sample would further confirm the efficacy of AI-created technologies in providing a consistently high-quality, tailored educational experience.

Educational Games

The findings of Case B demonstrate that AI tools are integrating interactive entertainment games in learning to improve students' mastery of learning materials or their engagement with the materials. The games create engaging and iterative learning sessions, where students become active participants in learning and their progress can be tracked through virtual tools since games allow educates to pinpoint strengths and areas of improvement.

Adaptive Educational Platforms

Case C demonstrates the way in which AI software can significantly enhance the writing abilities of students through diverse search options, immediate feedback, and group work collaboration. All of these contribute to improved critical thinking and analytical abilities. Nevertheless, the small sample size and short duration of the study (Gravetter & Forzano, 2019) suggest that these optimistic results need to be confirmed through larger and more diverse samples over longer periods.

Case E, by contrast, illustrates the transformative impact of the Alef program, which has considerably increased student motivation and learning achievements. The program identifies individual strengths and development areas through game design features and real-time tracking of achievements, thereby establishing a more personalized learning culture. The program also actively involves parents through providing continuous, in-depth reports and a dedicated online portal to monitor the child's academic progress. Even though these benefits, parents have complained about the program's accessibility, ease of use, and the time required to engage with it. To overcome these drawbacks, efficient implementations such as ClassDojo and Remind in the United States offer concrete examples of effective feedback strategies. These websites employ user-friendly mobile applications and real-time notifications to establish smooth communication between parents and teachers, suggesting that the same approach could enhance coordination and support through the Alef program.

In addition, adaptive learning platforms, such as shown in Case F, use AI to gather real-time information on student activity, thus adapting instructional content to unique requirements. Though these examples are taken from particular regional contexts, international systems like DreamBox in the United States and Smart Sparrow in Europe illustrate the universal applicability of the advantages of adaptive learning technologies, showing steady gains in learning outcomes in a variety of educational environments.

Lastly, Case G shows the application of AI-based educational robots in teaching hands-on subjects such as programming. The robots deliver interactive, hands-on learning experiences; however, their potential is at present restricted due to their reliance on pre-programmed commands and the limited sample size of the study. Scaling up this method to a larger, more diverse student population could release additional advantages, ensuring that interactive, AI-based tools assist an even wider variety of learning requirements in the educational domain.

METHODOLOGY

For this research, the research approach that has been selected is the qualitative research method, to develop an in-depth understanding on using AI in education and explore its benefits. Structured interviews were conducted with 15 participants to explore the benefits, complications, and usage of AI in the UAE's education system. The participants were asked eight open-ended questions, with the interviews lasting 15-30 minutes. Ethical considerations, such as obtaining informed consent and ensuring participant anonymity, were prioritized. The target population consisted of individuals with expertise or direct involvement in the UAE's education system, representing diverse roles and perspectives.

RESULTS

The results of the qualitative data that have been done were analysed and categorized into groups based on the questions that have been asked to the faculty members, experts, and students, in different schools, universities, and educational institutions in the UAE. As following:

Theme #1: Current AI Trends in Education

The answers for this question from the 15 respondents were similar, most of them said that Alef platform, ChatGPT and smart classrooms are the current trends in the education sector in the UAE. However, some respondents mentioned other AI technologies like Augmented Reality and Virtual Reality. Respondent K stated that "*There is a more integrative aspect of smart classrooms and virtual reality utilized within the classrooms, as this is the concept I have learned to work with ever since the outbreak of AI*".

Theme #2: Areas for Transformative Protentional of AI Education

93.3% of the respondents agreed that AI technology has shown transformative potential. Although, there were different opinions many respondents agreed that AI technology has particularly transformative potential. Some said smart classrooms are transformative areas as respondent D commented "*Yes, Specifically in smart classrooms as teachers used some intelligent systems to deliver that subjects. Also, they used virtual assistants to help the students better understand in the classes*" Other respondents said that the using the ChatGPT tool and personalized learning were massive transformative protentional.

Theme #3: Challenges and Complication in AI integration

According to majority of the respondents, the most complications and challenges that are faced while integrating AI are legal, ethical, privacy, protection andbudgetary issues. Two respondents said that resistance to change could be challenging for integrating AI as respondent D said "*Resistance of change, as some teachers are still liking to teach in old traditional way. Also, lack of training as some teachers need specified courses to know how to use AI tools in teaching*". In addition, there is a need for training and support for teachers who will be giving classes using this technology.

Theme #3: Impact of Teacher Effectiveness and Student Learning Outcome

All the respondents said that the AI technology has made positive impact on the teacher's effectiveness and the students learning in the same time. Some respondents explained that it has free up some time for the teacher to do some other tasks, as mentioned by respondent E "*The impact of AI in teacher effectiveness can be through saving time as it can free up sometimes for teachers to do some other tasks and for the students it can raise their*

performance". It also helped them in decision making based on the tools that analyse the information of the students and their grades. Teachers appreciate AI's ability to personalize lessons for students, leading to increase engagement and learning outcomes.

Furthermore, student respondents explained that the AI technology helped them in their studies and researches and it has improved student and support learning

Theme # 5: Areas Require Further Research

Respondent had different views regarding the areas that requires further research. The most important areas that are mentioned for further research are robotics, sustainability, and training the teachers on AI technology. As an example, respondent J commented "*It is important to explore the sustainability of AI platforms and their cost-effectiveness once it is introduced in educational entities*". In addition, the long-term viability of AI in education is an area that needs further research.

Theme # 6: Best Practices and Success Stories in AI Integration

The answers to this question have differed from one respondent to other. Some has answered that Alef platform is the best practice. Some mentioned Mohammed bin Rashid Smart Learning Program as respondent E commented "*There are many practices that could be noticed done by the UAE government like Mohammed bin Rashid Smart Learning Program which concentrates on some tools for teachers like the Smart Teacher Platform*". Virtual classrooms are also mentioned by some respondents.

Theme # 7: Comparison with Other Regions

All respondents agreed that UAE is a leading country to adopt the AI technology and developed a dedicated strategy for AI. Some quotes were "T*he UAE is always a leading country in everything as the governments support with budget and strategy*"

Also, it has put a budgetary to support the implementation of AI technology in all the major sectors and has created initiatives for short term and long-term run.

Theme # 8 Recommendation for Maximizing AI Benefits

Some respondents said that there should be public-private partnership between the entities. Others suggested to have some policies and strategies to get the maximum benefits from AI technology. Few has suggested to make labs and centres for AI and to have training programs to spread the culture of using AI. Respodent C stated "*Establish centers for the awareness and knowledge of AI, provide governmental incentives to educational institutions to invest in AI projects and education, and integrate AI education as part of the curriculum*".

In conclusion, we can notice from the above results that have been collected during the interview with the respondents that there are multiple AI trends in the UAE's education sector like ChatGPT. In addition, there are many areas for transformative potential for adapting AI. In addition, AI has huge positive impact in education sector for teacher effectiveness and the student's outcomes through saving time for teachers to do other tasks and increasing the performance of the students. Noticable best practises and success stories of AI integration were the Alef Platform implementation in the education sector. It is also clear that the UAE is always a leading country with a dedicated strategy on AI implementation in education. Finally, the recommendation to maximize AI benefits is to establish centers for innovation and knowledge sharing on AI technologies.

Discussion

There is a pattern both in the interview data and in the broader literature on AI integration in education: AI tools are changing the learning experience in basic ways. For example, the Alef systems, ChatGPT, and Smart Classrooms are becoming the norm in modern education because they individualize learning and make it easy to interact with course materials. Case E. Allowing for continuous monitoring of the student's performance, the Alef platform has further maximized its influence through continuous participation through an online portal where it provides real-time feedback and weekly detailed progress reports, which helps parents, students, and educators to note strengths and work on weakness areas in time. Sajjad (2023) depicts how these interventions contextualize learning material to accommodate varied curricula, thus simplifying the traditional approach to instruction and creating more interactive learning spaces.

In Case A, it is a clear example in China where such educational platforms like Yuanfudao and Zuoyebang use Narrow AI and tagging tools for delivering personalized tutoring and homework help. These tools not only help students overcome specific learning challenges but also significantly improve performance outcomes, effectively transforming traditional teaching roles into facilitative, adaptive learning experiences (Seo et al., 2021). Additionally, adaptive learning applications like Memrise and ChatGPT are automating learning processes by using real-time data to adjust content delivery based on individual learning patterns, as noted by Michel-Villarreal et al. (2023). This shift not only accelerates the learning process but also provides a more immersive and interactive educational experience.

Overall, the research indicates that AI tools are empowering both learners and educators by offering real-time feedback, personalized resources, and efficient content delivery methods. These innovations are leading to measurable improvements in student performance and engagement. The findings also emphasize the need for policymakers to build strong frameworks that support the responsible integration of AI in education—guidelines that could streamline administrative tasks and ensure that the benefits of these transformative technologies are realized across diverse educational settings.

CONCLUSION AND RECOMMENDATIONS

Conclusion

In summary, research on the increased application of AI in education has tremendous benefits especially in enhancing the performance of students and teaching quality. The knowledge of global trends in the use of AI gives the UAE a way forward in its drive to step up commitment to these transformative technologies. This study provides educational institutions and policymakers with a roadmap by identifying opportunities for further study while highlighting action-able initiatives.

For instance, the government of the UAE can add more of what it has presently already done, such as the Mohammed bin Rashid Smart Learning Program to be supported by robust teacher training in AI literacy, public–private partnerships, and innovation centers dedicated within schools and universities. Such policies may include grants for pilot AI projects, standardized AI training modules for educators, and other ways of providing real-time feedback to both the students and parents. These steps would enable an environment of acceptability and integration of AI, ensuring that learning experiences are tailored and enhanced through tools such as AI homework tutors, ChatGPT, and adaptive learning platforms.

The data regarding improved student performance and teaching quality due to AI implementation is enhanced by data concerning the personalized experience of learning along with qualitative insights gathered from structured interviews carried out among UAE education experts. The UAE can form a sustainable, AI-driven educational environment by adopting concrete policies such as mandatory AI training programs, incentivising public–private collaborations, and establishing comprehensive feedback mechanisms. Altogether, these are efforts that elevate the current state of learning yet position the United Arab Emirates firmly as a beacon of AI-integrated education through 2031.

Recommendations

Based on the above research, several recommendations can be implemented in the education sector to enhance the integration of AI technologies. There should be a strong collaboration and knowledge sharing in the process through national AI education conferences, regional workshops, and online communities where educators, researchers, and industry experts can exchange best practices, case studies, and lessons learned. Second, investment in teacher training and professional development should be a huge priority; schools and universities need to budget separately for continuous professional development programs focusing on AI literacy, including subsidised certification courses and hands-on workshops that show tools like ChatGPT and adaptive learning platforms. Third, quality monitoring and assurance mechanisms need to be strengthened by standardizing frameworks and performance metrics, the establishment of oversight committees consisting of educators, technologists, and policymakers, and regular collection of feedback through surveys and data analytics to ensure that AI initiatives achieve their intended purposes. Incorporating AI in curricula is of great importance; current curricula in educational institutions need to be updated with AI-related modules, and dedicated AI tracks or elective courses must be introduced. Interdisciplinary projects that integrate AI with mathematics, computer science, and the humanities also need to be encouraged. Implementation of these strategies particularly can allow schools, universities, and policymakers to have a sustainable approach in adopting AI with greater impacts on the outcomes of teaching and learning rather than making the education sector less competitive with rapid developments of the digital landscape.

Future Opportunities

Future research can include many areas for AI in education sector. It can concentrate on emotional and social learning support for students. This means recognizing the emotions of the students, analyzing it and guiding them for the best consultancy. Also, the future research can go through the integration of AI into STEM education program which help to analyze competencies and future ready skills. Moreover, future research can explore the use of AI in support services for the students like academic advising and career guidance. At the end, future research will include the speech recognition technologies which can help the students in their learning journey.

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