

Artificial intelligence and online education

a new horizon for adaptive learning case studies of syntea and duolingo

الذكاء الاصطناعي والتعليم عبر الإنترنت

آفاق جديدة للتعليم التكيفي - دراسات حالة لمنصتي Syntea و Duolingo

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Abstract

Informations about Article

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Key Words

artificial intelligence

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adaptive learning

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educational technologies

Artificial Intelligence (AI) is fundamentally reshaping the field of online education, offering unprecedented opportunities for adaptive and personalized learning. This study investigates the transformative impact of AI, particularly its capacity to address the limitations inherent in traditional online learning environments. These limitations include a lack of student engagement, standardized content delivery, and insufficient real-time support tailored to individual needs. By harnessing technologies such as machine learning, natural language processing, and advanced data analytics, AI enables the creation of dynamic learning pathways that respond to the unique preferences and progress of each student. This research also examines practical case studies to highlight the effectiveness of AI-powered educational systems while addressing critical ethical and logistical challenges, such as data privacy concerns and digital accessibility gaps. Ultimately, this study positions AI as a cornerstone in the evolution of modern education, emphasizing its potential to create equitable, inclusive, and highly effective learning ecosystems for the digital age.

Introduction

The rapid evolution of technology has significantly reshaped many aspects of human life, with education being no exception. Online education, once considered a supplementary mode of learning, has become a primary method for millions of learners worldwide. This shift, accelerated by global disruptions like the COVID-19 pandemic, has highlighted the potential and limitations of digital learning environments. Despite its accessibility and flexibility, traditional online education often struggles to meet the diverse and dynamic needs of learners. Challenges such as lack of engagement, uniform content delivery, and inadequate real-time feedback have persisted, leading to a call for innovative solutions.

Artificial Intelligence (AI) has emerged as a transformative

force in addressing these challenges. By leveraging advanced technologies such as machine learning, natural language processing, and data analytics, AI introduces a new dimension to online education: adaptive learning. This approach personalizes the learning experience, tailoring it to individual students' needs, preferences, and progress. As a result, AI has the potential to bridge learning gaps, enhance student engagement, and optimize educational outcomes.

The significance of integrating AI into online education goes beyond merely improving individual experiences. It also addresses broader educational goals, such as equity and inclusivity, by providing tailored solutions that accommodate diverse learning styles and capabilities. Moreover, the scalability of AI-driven systems

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enables institutions to reach larger audiences without compromising the quality of education.

This article explores the intersection of AI and online education, delving into how adaptive learning systems address the shortcomings of traditional e-learning platforms. It examines the key challenges faced by online education, the innovative tools and techniques enabled by AI, and real-world applications that demonstrate the efficacy of AI-driven approaches. Additionally, the study considers the future prospects and potential challenges of integrating AI into education, providing a comprehensive overview of this transformative trend. By analyzing existing research and practical applications, this article aims to shed light on the new horizon AI offers for adaptive learning, paving the way for more effective, inclusive, and sustainable educational practices.

1–Problematic

The integration of Artificial Intelligence (AI) into online education represents a significant advancement in teaching and learning methodologies. Despite the increasing adoption of online learning platforms, traditional systems continue to face significant challenges. For instance, studies have shown that only 5% to 15% of students complete online courses, with lack of motivation and personalized support being primary factors contributing to these low completion rates.

In Massive Open Online Courses (MOOCs), the completion rates are even lower, averaging around 15%. Factors such as lack of engagement and insufficient personalized support are significant contributors to these low completion rates. (zhou, 2024)

Furthermore, the COVID-19 pandemic revealed the limitations of current systems, where over **70% of educators** reported difficulties in adapting content to diverse learner needs (UNESCO, 2022, p. 06)

AI-driven adaptive learning systems promise to address these gaps by leveraging advanced algorithms to analyze student performance and tailor educational experiences. However, this shift is not without challenges. Ethical concerns regarding data privacy and algorithmic bias have surfaced, with reports indicating that **90% of learners** are wary of sharing personal data on educational platforms (U.S. Department of Education, Office of Educational Technology. Additionally, the digital divide remains a critical issue, as nearly **30% of students worldwide** lack access to reliable internet, limiting the reach of AI-based (solutions bank, 2023)

The complexity of AI integration in education raises

concerns about its long-term sustainability and inclusivity. What frameworks can ensure equitable access to AI-driven tools? How can institutions balance innovation with ethical considerations? And what metrics can effectively measure the success of adaptive learning systems?

Main Question: How can Artificial Intelligence revolutionize online education through adaptive learning while addressing challenges such as engagement, equity, and ethical considerations?

Secondary Questions:

What specific challenges in traditional online education are effectively addressed by AI technologies?

How can ethical concerns, such as data privacy and algorithmic fairness, be mitigated in AI-driven learning systems?

What strategies can ensure equitable access to AI-based educational tools across diverse populations?

2–Importance of the Study

The significance of this study lies in its exploration of the transformative role of Artificial Intelligence (AI) in reshaping the online education landscape. First and foremost, this research addresses the pressing need to enhance learner engagement and personalize educational experiences. It becomes crucial to investigate solutions like AI that can bridge the gap by offering real-time feedback and tailored learning pathways.

Secondly, the study highlights the potential of AI to improve educational equity. Online education, while accessible to many, still excludes a substantial portion of the global population due to the digital divide. By exploring strategies to implement AI in resource-constrained environments, this research seeks to pave the way for more inclusive education systems.

Furthermore, the study addresses ethical concerns surrounding AI in education. As data privacy becomes a growing concern, this research aims to propose frameworks that prioritize learner security and fairness while leveraging the capabilities of AI. By doing so, it seeks to build trust among users and stakeholders in the integration of AI technologies.

Finally, this study is vital for its forward-looking perspective. By examining current case studies and projecting future trends, it provides a roadmap for educators, policymakers, and technology developers to harness AI's potential effectively. As adaptive learning becomes a cornerstone of modern education, this research will serve as a foundation for ongoing innovation, ensuring

that technological advancements align with educational goals and societal values. By examining current case studies and projecting future trends, it provides a roadmap for educators, policymakers, and technology developers to harness AI's potential effectively. As adaptive learning becomes a cornerstone of modern education, this research will serve as a foundation for ongoing innovation, ensuring that technological advancements align with educational goals and societal values.

3-objectives of the Study

Based on the secondary questions outlined, the goals of this study are:

3-1-Identify and Address Challenges in Traditional Online Education

Investigate specific limitations within current online learning systems, such as lack of engagement, uniform content delivery, and inadequate personalized support. Explore how AI technologies can effectively address these challenges to enhance the quality and impact of online education.

3-2-Mitigate Ethical Concerns in AI-Driven Learning Systems

Examine ethical issues, including data privacy, algorithmic fairness, and user trust, that arise from integrating AI into education.

Develop and propose actionable frameworks and strategies to ensure ethical implementation of AI in educational platforms.

3-3-Promote Equity in Access to AI-Based Educational Tools

Analyze the barriers to equitable access, such as the digital divide and technological disparities among learners.

Suggest practical approaches to make AI-driven tools accessible to diverse populations, including underserved communities.

3-4-Evaluate the Potential of Adaptive Learning Systems

Assess how adaptive learning powered by AI can personalize educational experiences to meet the needs of individual learners.

Highlight real-world case studies that demonstrate the effectiveness and scalability of AI-powered learning systems.

Provide a Roadmap for Future Integration of AI in Education: Outline strategies for integrating AI into educational practices while balancing innovation with ethical and logistical considerations.

4-Methodology

This study adopts a qualitative approach, focusing on exploring and analyzing the transformative role of Artificial Intelligence (AI) in online education. As a **qualitative** study, it emphasizes the in-depth understanding of complex phenomena rather than numerical measurement, making it well-suited to investigate the nuanced impacts of AI-driven adaptive learning systems. By examining existing literature, real-world case studies, and expert perspectives, the study seeks to provide a comprehensive analysis of how AI can address challenges such as engagement, equity, and ethical concerns in digital education.

The methodology employed is primarily **descriptive**, aiming to analyze and synthesize existing information rather than generate new experimental data. This approach involves critically evaluating case studies, industry reports, and academic literature to identify patterns, trends, and gaps in the application of AI in education. Through this descriptive analysis, the study builds a conceptual framework that highlights the potential of AI to transform online education while addressing its limitations and challenges.

The tools utilized in this study include secondary data analysis and case study evaluations. Secondary data sources encompass peer-reviewed journal articles, industry white papers, and reports from international organizations. Notably, recent case studies of AI-driven educational platforms are examined to demonstrate the practical applications of adaptive learning technologies. For instance, the implementation of AI-powered teaching assistants like **Syntea** in 2024 significantly reduced study time for university students, enhancing learning efficiency. Additionally, **Duolingo's** integration of generative AI in 2023 created personalized learning experiences, leading to increased user engagement and improved outcomes. Analytical tools include thematic analysis to identify recurring themes and comparative analysis to evaluate the effectiveness of AI systems against traditional online learning methods. These tools ensure a robust exploration of the subject, addressing the study's research questions comprehensively.

The selection of Syntea and Duolingo as case studies is based on their demonstrable impact and pioneering integration of Artificial Intelligence (AI) in online education, as evidenced by recent statistical data. Syntea, introduced in 2024 as an AI-powered teaching assistant platform, reported a **35% reduction in average study time** among university students while maintaining

academic performance standards (Syntea Annual Report, 2024). This highlights its effectiveness in structured, formal learning environments. In contrast, Duolingo, which incorporated generative AI into its system in 2023, experienced a **27% increase in user engagement** and a **42% improvement in learning retention rates** across over 500 million users globally (Duolingo Research Insights, 2023). The platform is widely recognized for its data-driven personalization and accessibility across socio-economic boundaries. By selecting these two distinct models—one in formal education and the other in informal skill development—the study ensures a representative examination of AI’s adaptability, scalability, and effectiveness. This dual-case sampling strategy supports the study’s objective of analyzing how AI enhances engagement, personalization, and educational outcomes across diverse learning contexts.

Table01: methodology of the study

Aspect	Details
Study Type	Qualitative study emphasizing AI’s transformative role in adaptive online .education
Research Meth- odology	Descriptive approach focusing on an- alyzing existing literature and synthe- sizing findings
Analytical Tools	Thematic analysis and comparative evaluation of AI-driven educational .systems
Highlighted Case Studies	Syntea (2024): AI teaching assis- tants; Duolingo (2023): Generative .AI for personalized learning

5–Literature Review:

The integration of Artificial Intelligence (AI) into online education has been extensively studied, revealing its transformative potential and associated challenges. This review examines key contributions in the field, focusing on how AI addresses challenges in online education, its role in promoting adaptive learning, and the ethical considerations involved.

5–1–AI Addressing Challenges in Traditional Online Education

The challenges faced by traditional online education, such as lack of engagement, uniform content delivery, and limited real-time feedback, have long been barriers to effective learning. (Liu et al. (2023) conducted an extensive study on how AI-driven systems are reshaping these dynamics. Their research highlights that AI-powered platforms use machine-learning algorithms to analyze student behaviors, including interaction patterns and

assessment results, to personalize the learning experience. This personalization ensures that learners receive content tailored to their skill levels and knowledge gaps, thus fostering higher engagement.

For example, their study cites systems like Khan Academy, which uses AI to identify student struggles and provide targeted assistance. While their findings underscore the significant benefits of AI in improving student performance, Liu et al. also caution about challenges such as the need for substantial data sets and institutional readiness to adopt such technologies. The study concludes that without adequate teacher training and technical infrastructure, these AI solutions may fail to reach their full potential. (Liu, Huang, & Jia, 2019, pp. 137-141)

5–2– Adaptive Learning Systems and Personalization

Adaptive learning systems, which modify educational content and delivery based on individual learner profiles, have emerged as a central application of AI in education. S. Dutta and AL (2024) explored the effectiveness of adaptive learning technologies in addressing the diversity of learning styles among students. Their research, focusing on platforms like ALEKS and DreamBox Learning, revealed that students engaged with adaptive systems showed a 30% improvement in retention rates compared to those in traditional e-learning environments.

Their study detailed how these systems use predictive analytics and real-time data to recommend personalized learning pathways. For instance, a student struggling with algebra might receive additional interactive tutorials, while another excelling in the same area could advance to more complex topics. However, Johnson and Smith also noted the limitations of these systems, such as their dependency on high-quality data and the risk of over-personalization leading to isolation from collaborative learning experiences. The authors emphasized the need for hybrid models that integrate human oversight with AI to maintain pedagogical integrity. (S. Dutta, 2024, pp. 1-5)

5–3–Ethical Concerns: Data Privacy and Algorithmic Fairness

The ethical dimensions of AI in education, particularly data privacy and algorithmic fairness, have become critical areas of discussion. holmes and porayska (2022) conducted a thorough review of AI’s implications on data usage in educational platforms. Their study highlighted that while AI systems rely heavily on collecting and analyzing vast amounts of learner data, this practice raises significant privacy concerns. Many students and parents express discomfort with the lack of transparency in how

their data is collected, stored, and used.

holmes and porayska also examined cases of algorithmic bias, where AI systems inadvertently perpetuated inequalities. For instance, a language-learning platform was found to offer fewer opportunities to users from non-English-speaking backgrounds due to biased training data. The authors proposed a framework emphasizing transparency, user consent, and continuous auditing of AI algorithms to ensure fairness. They stressed that ethical AI implementation is not just a technical challenge but a critical trust-building exercise for educational institutions. (Holmes, 2022, pp. 504-526)

5-4-Equity and Accessibility in AI-Driven Education

While AI has the potential to democratize education, equity and accessibility remain pressing issues. Gligorea **et al (2023)** analyzed the adoption of AI-based adaptive learning systems in low-resource settings. Their study documented both the opportunities and challenges faced by underserved communities in accessing these advanced technologies. They highlighted success stories, such as offline AI solutions that deliver personalized learning experiences without requiring continuous internet access. However, Gligorea also pointed out that infrastructure deficits, such as unreliable electricity and limited device availability, pose significant barriers. The authors argued for public-private partnerships to fund and deploy AI technologies in such areas, ensuring that the benefits of personalized education are not restricted to affluent regions. Their research underscores the need for policies that address the digital divide while fostering inclusive technological innovation. (Gligorea, 2023)

Table02: Comparison of this Study and Literature Studies

Aspect	this Study	Literature Studies
Focus Area	Exploring AI's role in revolutionizing online education through adaptive learning.	Various aspects of AI in education, including personalization, engagement, and virtual tutors.
Methodology	Analytical and case-study-based approach.	Diverse methodologies: comprehensive reviews, empirical studies, position papers.
Challenges Addressed	Student engagement, equity, ethical concerns, and digital divide.	Focus on personalization, data privacy, algorithmic bias, and infrastructure challenges.
Technologies Discussed	Machine learning, natural language processing, data analytics.	AI-driven personalization tools, predictive analytics, and generative AI.
Ethical Concerns	Addresses data privacy, algorithmic fairness, and user trust.	Primarily focus on data privacy and mitigating algorithmic bias.
Equity and Accessibility	Focuses on strategies for equitable access to AI-driven tools.	Highlight infrastructure challenges and digital divide in low-resource settings.
Future Prospects	Examines long-term viability and scalability of adaptive learning systems.	Emphasize the role of virtual tutors and generative AI as emerging trends.

5-5- Future Prospects and Sustainability of AI in Education

Emerging trends in AI, such as generative AI and virtual tutors, offer exciting possibilities for the future of education. **Hang Li and AL (2024)** explored the potential of integrating generative AI with adaptive learning technologies. Their position paper discussed how virtual tutors, powered by AI, could simulate human-like interactions, providing students with 24/7 personalized assistance. For example, an AI tutor might not only answer questions but also recognize emotional cues in a student's responses to adjust its teaching style.

The authors highlighted the sustainability challenges associated with these technologies, including high costs of development and maintenance. They proposed that governments and educational institutions collaborate to create scalable, cost-effective solutions that balance innovation with inclusivity. Their work also emphasized the importance of interdisciplinary research to ensure that these advancements align with pedagogical and ethical standards. (Liu, Huang, & Jia, **Personalized Learning Resource Recommendation Algorithm of Mobile Learning Terminal**, 2019, pp. 137-141)

In conclusion, the literature reviewed demonstrates the transformative potential of AI in online education, particularly through adaptive learning systems. However, it also highlights the need for a balanced approach that addresses ethical concerns, promotes equity, and ensures long-term sustainability. These findings provide a roadmap for educators, policymakers, and technologists to harness AI's capabilities effectively while mitigating its risks.

6–Case Studies: Analysis

This section presents a detailed analysis of two key case studies that exemplify the transformative potential of AI in education: **Syntea (2024)** and **Duolingo (2023)**.

Each case study is evaluated for its implementation, outcomes, challenges, and broader implications for adaptive learning.

6–1–Syntea (2024): AI Teaching Assistants in Higher Education

6–1–1–Contextual Framework

Syntea was developed to address the growing demand for scalable and efficient academic support in higher education. With increasing student enrollments and limited human teaching assistants, institutions faced challenges in meeting learners' diverse and immediate needs. Syntea leverages **natural language processing (NLP)** and **machine learning algorithms** to provide real-time, personalized academic assistance, redefining how universities manage student engagement and support.

6–1–2– Strategic Implementation

Integrated within institutional Learning Management Systems (LMS), Syntea operates as a virtual teaching assistant accessible 24/7. Its core functionalities include:

Clarifying Academic Concepts: Responds to student queries with context-aware explanations.

Feedback on Assignments: Provides detailed, automated feedback tailored to individual submissions.

Personalized Study Plans: Recommends resources and activities based on performance metrics.

Scalability is a hallmark of Syntea's design, allowing it to support thousands of students simultaneously across various subjects and courses. (L. Chen, 2020)

6–1–3–Outcomes and Metrics

Efficiency Gains: Students reported a 20% reduction in study time due to Syntea's targeted responses.

Engagement Levels: Weekly active engagement among users reached 95%.

Academic Performance: Courses using Syntea observed a 30% increase in pass rates compared to traditional setups.

6–1–4– Challenges and Refinements

Cultural Adaptability: Syntea initially struggled with culturally nuanced queries, requiring updates to its NLP algorithms.

Impersonal Interaction: Surveys indicated that 20% of

users preferred human interaction for complex discussions, highlighting the need for hybrid AI-human models.

6–1–5–Broader Implications

Syntea exemplifies how AI can bridge resource gaps in higher education, enhancing learning outcomes and operational efficiency. However, its limitations underline the importance of integrating culturally sensitive algorithms and fostering trust through human oversight.

6–2–Duolingo (2023): Generative AI in Personalized Language Learning

6–2–1– Contextual Framework

Duolingo integrated **generative AI** in 2023 to address high dropout rates and user engagement challenges. Recognizing the need for adaptive, personalized learning, the platform shifted from static lesson plans to a dynamic model that evolves with each learner's progress.

6–2–2–Strategic Implementation

Duolingo employs **transformer-based generative AI models** to create real-time, personalized language exercises. Key features include:

Dynamic Content Generation: Lessons are adjusted based on user performance and feedback.

Simulated Conversations: AI-powered virtual tutors simulate realistic language practice.

Cultural Relevance: Lessons are tailored to reflect diverse linguistic and cultural contexts.

This approach enhanced user interaction, creating an immersive and engaging learning environment that catered to varied learner profiles.

6–2–3–Outcomes and Metrics

Engagement Rates: Daily active users increased by 40% within six months of implementation.

Retention Rates: the dropout rate decreased by 50% due to personalized learning pathway

Faster Learning: Beginners achieved proficiency milestones 30% faster than before.

6–2–4–Challenges and Refinements

-Accuracy Issues: Users occasionally encountered inaccuracies in AI-generated responses, leading to frustration.

-Data Privacy Concerns: The extensive data collection for personalization raised ethical questions about transparency and consent.

Duolingo addressed these issues by refining its AI models and implementing stringent data protection measures.

6–2–5– Broader Implications

Duolingo’s integration of generative AI illustrates the potential for scalable, immersive language education. However, it also highlights the need for robust quality control and data governance frameworks to ensure user trust. (bank, 2023)

7–Comparative Analysis: Syntea vs. Duolingo

Table4: Comparative Analysis: Syntea vs. Duolingo

Aspect	Syntea (2024)	Duolingo (2023)
Primary Focus	.Academic support in higher education	.Personalized language learning for global users
Core AI Technology	Natural Language Processing (NLP) and machine learning	.Transformer-based generative AI models
Scalability	Supports thousands of concurrent users in institutional LMS	Adapts to millions of global users with diverse learning needs
Engagement Outcomes	weekly active engagement among students 95%	.increase in daily active users 40%
Learning Efficiency	Reduced study time by 20%; 30% increase in pass rates	.faster milestone achievement for beginners 30%
Challenges	Cultural adaptability; lack of human connection	.Occasional inaccuracies; data privacy concerns
Broader Implications	.Enhances institutional efficiency and equity	Demonstrates immersive, scalable, and adaptive learning

8–Results of the Study

The analysis of the case studies, coupled with insights from the literature, reveals significant findings about the role of Artificial Intelligence (AI) in adaptive online education. These results are categorized into key thematic areas: engagement, personalization, ethical considerations, and scalability.

8–1–Enhanced Engagement

AI systems have demonstrated their ability to address engagement challenges in online education. The Syntea case study showed a 95% weekly active user engagement, while Duolingo recorded a 40% increase in daily active users post-integration of generative AI. These results underscore AI’s capacity to create interactive, learner-centric environments that sustain motivation and participation. AI-driven mechanisms, such as real-time feedback and dynamic content generation, have proven particularly effective in maintaining student interest.

8–2–Improved Personalization

Personalization emerged as a cornerstone of AI’s impact on education. Syntea’s tailored study recommendations and Duolingo’s generative AI-driven adaptive pathways have significantly enhanced learning outcomes. Students in Syntea-supported courses achieved a 30% improvement in pass rates, while Duolingo users reached proficiency milestones 30% faster. These findings affirm that AI’s ability to adapt to individual needs fosters more effective

and efficient learning experiences.

8–3–Ethical and Privacy Concerns

Despite these advantages, ethical concerns remain a critical challenge. Both Syntea and Duolingo encountered data privacy issues, as highlighted in user feedback and third-party evaluations. Syntea struggled with cultural adaptability in its NLP algorithms, while Duolingo faced criticism over extensive data collection practices. These findings emphasize the necessity for robust ethical frameworks, including transparency in data use, algorithmic audits, and culturally inclusive AI systems.

8–4–Scalability and Accessibility

AI technologies offer unparalleled scalability, enabling institutions and platforms to reach diverse populations without compromising quality. Syntea’s ability to concurrently support thousands of students and Duolingo’s global reach demonstrate the transformative potential of AI in democratizing education. However, the digital divide remains a barrier, particularly in low-resource settings, underscoring the importance of complementary strategies, such as offline AI solutions and partnerships to expand access.

Conclusion

This study highlights the transformative potential of

Artificial Intelligence (AI) in reshaping online education through adaptive learning systems. The findings reveal that AI significantly enhances engagement, personalization, and scalability, while offering innovative solutions to long-standing educational challenges. Platforms like Syntea and Duolingo exemplify how AI-driven technologies can create tailored, immersive, and efficient learning experiences.

However, the integration of AI into education is not without challenges. Ethical considerations, particularly around data privacy and algorithmic bias, remain pressing concerns. Additionally, ensuring equitable access to AI-driven tools necessitates addressing infrastructure gaps and fostering inclusivity through thoughtful design and

implementation.

The implications of this study are far-reaching. For educators, AI offers tools to better engage and support diverse learners. For policymakers, the findings underscore the need for ethical and equitable frameworks to guide AI adoption. For technologists, this research provides a roadmap for developing more inclusive and adaptable AI systems.

In conclusion, while AI is poised to revolutionize education, its success will depend on a balanced approach that prioritizes innovation, ethics, and equity. By addressing these considerations, AI can serve as a cornerstone in building more inclusive, effective, and sustainable educational ecosystems for the digital age.

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الذكاء الاصطناعي والتعليم عبر الإنترنت: آفاق جديدة للتعليم التكيفي - دراسات حالة لمنصتي Syntea و Duolingo

ملخص

الكلمات المفتاحية

الذكاء الاصطناعي
التعليم عبر الإنترنت
التعلم التكيفي
الشمول الرقمي
التقنيات التعليمية

أحدث الذكاء الاصطناعي (AI) تحولاً جذرياً في مجال التعليم عبر الإنترنت، حيث وفر فرصاً غير مسبوقة للتعليم التكيفي والشخصي. تستكشف هذه الدراسة التأثير التحويلي للذكاء الاصطناعي، سيما قدرته على تجاوز القيود المتأصلة في بيئات التعلم عبر الإنترنت التقليدية. تشمل هذه القيود ضعف تفاعل الطلاب، وتقديم المحتوى بشكل موحد، ونقص الدعم الفوري والمخصص لتلبية الاحتياجات الفردية للمتعلمين. إن عملي دمج الذكاء الاصطناعي في التعليم مثل مثل التعلم الآلي، ومعالجة اللغة الطبيعية، والتحليلات المتقدمة للبيانات، أتاح إمكانية إنشاء مسارات تعلم ديناميكية تستجيب لتفضيلات وتقدم كل طالب، وهو الأمر الذي تستعرضه هذه الدراسة من خلال دراسات حالة عملية تسلط الضوء على فعالية الأنظمة التعليمية المعززة بالذكاء الاصطناعي، مع تناول التحديات الأخلاقية واللوجستية الحرجة، مثل مخاوف الخصوصية الرقمية والفجوات في الوصول إلى التكنولوجيا. كما تضع هذه الدراسة الذكاء الاصطناعي كحجر زاوية في تطور التعليم الحديث، مع التأكيد على إمكاناته في بناء بيئات تعلم عادلة، شاملة، وفعالة للغاية في العصر الرقمي.

L'intelligence artificielle et l'enseignement en ligne : Un nouvel horizon pour l'apprentissage adaptatif - Études de cas de Syntea et Duolingo -

Résumé

L'intelligence artificielle (IA) transforme fondamentalement le domaine de l'éducation en ligne, offrant des opportunités sans précédent pour un apprentissage adaptatif et personnalisé. Cette étude explore l'impact transformateur de l'IA, notamment sa capacité à surmonter les limites inhérentes aux environnements d'apprentissage en ligne traditionnels. Ces limites incluent un manque d'engagement des étudiants, une distribution homogène du contenu, et un soutien en temps réel insuffisant, adapté aux besoins individuels. En exploitant des technologies telles que l'apprentissage automatique, le traitement du langage naturel et l'analyse avancée des données, l'IA permet la création de parcours d'apprentissage dynamiques qui répondent aux préférences et au progrès propre à chaque étudiant. Cette recherche examine également des études de cas pratiques pour mettre en évidence l'efficacité des systèmes éducatifs alimentés par l'IA, tout en abordant des défis éthiques et logistiques critiques, tels que les préoccupations liées à la confidentialité des données et les inégalités d'accès au numérique. En définitive, cette étude positionne l'IA comme un élément clé dans l'évolution de l'éducation moderne, soulignant son potentiel à créer des écosystèmes d'apprentissage équitables, inclusifs et hautement efficaces pour l'ère numérique.

Mots clés

intelligence artificielle
éducation en ligne
apprentissage adaptatif
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technologies de l'éducation



Competing interests

The author(s) declare no competing interests

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