REPORT FROM THE ICDE QUALITY NETWORK 2024:

AI IN ACTION:

Global Perspectives on the Application of AI in Education

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PREFACE

The ICDE Quality Network consists of academic experts appointed as regional Focal Points on Quality among ICDE institutional members. All world regions are represented. The Quality Network informs and advises ICDE's members on quality assurance and quality enhancement of open, flexible, distance and technology enhanced education.

In 2024, the network Chair Dr. Souma Alhaj Ali has continued to encourage and lead the network members in developing a range of resources and activities relevant to ICDE's strategic priorities and main objectives:

- The Quality Resources section in the members' area of ICDE's website has been further developed with quality resources from various regions, including introductions and cross-references.
- The Focal points from Africa and Oceania have significantly contributed to launching and extending ICDE's advocacy task forces in their respective regions by liaising with members and partners in these regions.
- The Quality Network was well represented with 5 Focal Points present at the ICDE Leadership Summit in Geneva in June, titled: "Ethical Leadership in the Age of AI: Rethinking Futures of Education". Academic integrity and quality assurance in relation to AI were highly addressed and sparked some good discussions regarding both challenges and potential for AI in education.
- A webinar hosted by the Quality Network in October built on the discussions and takeaways from the Geneva conference under the headline: "AI in Action: Applicable AI for Education". The webinar attracted almost 250 registered participants and demonstrated the need for practical approaches on how to implement AI in education, in addition to guiding policies.
- A second webinar took place in November in collaboration with HBMSU and the ICDE Global Doctoral Consortium named: "Building Collaborative PHD networks". This webinar aimed at reaching emerging scholars to engage with the theme of quality enhancement of education in diverse and digital contexts and counted nearly 100 registrations.

In the 2024 Quality Network report, the regional Focal Points were tasked to outline the application of AI in education from their regional perspectives. This includes the status of adoption and implementation of AI, its impact on quality, learners' experience, access, and efficiency, as well as risks and challenges, good practices and recommendations.

I would like to thank the ICDE Focal Points on Quality for providing their highly valuable insights to this report. A sincere appreciation goes to our Chair, Dr. Souma Aljah Ali, for her inspiring leadership and outstanding working capacity, well reflected in her comprehensive thematic introduction to this report.

Oslo, January 2025

Torunn Gjelsvik,

ICDE Secretary General

THEMATIC INTRODUCTION

Souma Alhaj Ali

Chair ICDE Quality Network

Director for Excellence and Governance, Hamdan Bin Mohammed Smart University

Teaching and Learning in the AI Era

According to John McCarthy, the father of Artificial intelligence (AI), AI is the science and engineering of making intelligent machines and computer programs. It is inspired by, but typically operates quite differently from, the ways people use their nervous systems and bodies to perceive, reason, and act. While the rate of progress in AI has been sporadic and unpredictable, there have been significant advances since the field's inception around sixty years ago (McCarthy, 2019). The combination of data explosion and exponential computation growth created an inflection point in the development and application of AI technologies.

Intelligence is a property of the mind that encompasses many related mental abilities, such as the capabilities to learn, reason, plan, solve problems, think abstractly, and comprehend ideas and language. Through AI, computers, robots, or machines are programmed to exhibit some form of intelligence, including reasoning, logic operation, and decision making. AI systems are powered by algorithms, using techniques such as machine learning and deep learning to demonstrate "intelligent" behavior. Intelligent behavior can range from recognizing patterns and faces to performing complex functions (IBM Cloud Education, 2020; Research Pathfinder Report, 2019; Russell and Norvig, 1992). With AI, it is possible for systems to:

- Learn new concepts and tasks,
- Reason and draw useful conclusions about the world around us,
- Remember complicated interrelated facts and draw conclusions from them,
- Understand a natural language or perceive and comprehend a visual scene,
- Make predictions or classifications based on input data,
- Look through cameras and see what's there, and
- Move themselves and objects around in the real world.

Based on capabilities and aim, AI is classified into two main categories: Strong AI and Weak AI. Strong AI, also known as artificial general intelligence or general AI, is a theoretical form of AI that aims to create machines that exhibit an intelligence equal to humans and even are indistinguishable from the human mind; it would have a self-aware consciousness that has the ability to solve problems, learn, and plan for the future. Strong AI is an open area for research and exists mainly today as a theoretical concept (Winston, 1992). The other category, Weak AI, or narrow AI "is a type of AI that uses advanced algorithms to complete certain problem-solving or reasoning tasks that do not require the entire range of human cognitive abilities. Weak AI refers to systems that are programmed to solve a wide variety of issues but only perform within a limited set of functions".

Voice-based personal assistants like Siri and Alexa, Meta's (previously Facebook) newsfeed, Amazon's suggested purchases, spam filters in email, are all examples of weak AI (Anand, 2022; Burns et al., 2021). This report focuses on the applications of weak AI in the area of teaching and learning.

AI is built on a variety of techniques and algorithms; the most common ones are machine learning, deep learning, artificial neural networks, natural language processing, pattern recognition, and machine vision. AI applications are growing rapidly, it is manifesting in various sectors and has brought about a lot of possibilities to the education sector as well. AI has already been applied to education primarily to support educators and administrators. As AI educational solutions continue to mature, the hope is that AI will drive efficiency, personalization and streamline administrative tasks.

Current applications of AI in education include: Chatbots and intelligent tutoring systems, automated assessment, and the development of digitized content as briefly outlined below.

Chatbots and Intelligent Tutoring System

Chatbots are intelligent software agents that simulate human-like conversations with users via text messages on chat. Chatbots receive information (sensory inputs) through keystrokes, file contents, and network packets as and acts on the environment by displaying on the screen, writing files, and sending network packets (IBM Cloud Education, 2020). Chatbots exist under several names including conversational agents and AI assistance and can chat with multiple users within seconds. Chatbots are powered by pre-programmed responses, artificial intelligence, or both. Based on the applied mechanism, a chatbot processes a user’s question to deliver a matching answer. Currently, there are two main types of chatbots: rule-based chatbots and AI chatbots. Rule-based chatbots communicate and provide answers based on a set of if/then rules of predefined answers that can vary in complexity. These rules are defined and implemented by a chatbot designer. They don’t understand the context of the conversation but provide matching answers to a keyword or a command they were programmed to answer. AI chatbots, on the other hand, are intelligent agents who leverage machine learning, Natural language processing (NLP), sentiment analysis, planning, multi-agent systems, ontologies, and social and emotional computing to provide a personalized communication to the user. Some ITS also use other technologies such as multimedia, object-oriented systems, modeling, and simulation. AI chatbots learn from past conversations but they also need to be trained and equipped with predefined responses to get started (ChatBot, 2022).

Chatbots are not entirely new, it could be claimed that the idea was introduced in 1950 by Alan Turing in his paper “Computing Machinery and Intelligence” where he implied that a computer program can think and talk like a human. The first chatbot, a computer program called Eliza, was introduced in 1966 by Joseph Weizenbaum, Eliza was developed as a simple keyword-based chatbot that mimics a human psychiatrist. Eliza communicated to users by matching user questions with scripted responses entered into its database. Since then, many chatbots were introduced, they gained popularity following Siri, a virtual assistant developed by Apple in 2010, Siri was the first personal assistant available worldwide followed by Google Now in 2012, Microsoft's Cortana, and

Amazon's Alexa in 2014 (ChatBot, 2022). Currently, chatbot growth has been prominent across a vast variety of sectors and applications including education. Educational chatbots are transforming the way higher education institutions interact with their learners. They are used for several purposes including tutoring and learners' support.

An Intelligent Tutoring System (ITS) is a chatbot that aims to provide immediate and customized instruction or feedback to learners, usually without requiring intervention from a human teacher. ITSs have the common goal of providing access to education to each and every learner and enabling learning in a meaningful and effective manner. ITS personalizes the instruction based on the background and the progress of every individual learner. Modern ITS aims to replicate the role of the educator or a teaching assistant, and automate pedagogical functions such as problem generation, problem selection, and feedback generation to demonstrate benefits of one-to-one, personalized tutoring, in contrast to one-to-many instruction from a single teacher in traditional classroom lectures or no teacher at all in self-paced (asynchronous) online lectures. There is a close relationship between intelligent tutoring, cognitive learning theories and design; and there is ongoing research to improve the effectiveness of ITS (ChatBot, 2022; Jovic, 2022).

ITSs usually consist of components or modules including: the learner module, the tutoring module, the domain module, and the user interface module. The domain module (or cognitive module or expert knowledge module) is built on a theory of learning, which tries to take into account all the possible steps required to solve a problem. The learner module is the core component that takes into account the cognitive state of the learners and their progress. The tutor module makes choices about tutoring strategies and actions based on input from the domain and learner modules.
The user interface component "integrates three types of information that are needed in carrying out a dialogue: knowledge about patterns of interpretation (to understand a speaker) and action (to generate utterances) within dialogues; domain knowledge needed for communicating content; and knowledge needed for communicating intent" (Arnau-González et al., 2023; Shneyderman, 2001).

There are several examples of ITSs being used recently, in both formal education and professional settings in which they have demonstrated their capabilities and limitations. Algebra Tutor PAT, developed by the Pittsburgh Advanced Cognitive Tutor Center at Carnegie Mellon University with the aim to tap into a learners' prior knowledge and everyday experiences with mathematics, supports learners in anchored learning problems and uses modern algebraic tools to engage learners in problem solving and in sharing of their results (Shneyderman, 2001). AutoTutor, developed by researchers at the Institute for Intelligent Systems at the University of Memphis, is another ITS that holds conversations with learners in natural language. It assists learners in learning computer hardware, operating systems and the Internet in an introductory computer literacy course by simulating the discourse patterns and pedagogical strategies of a human tutor, AutoTutor branched out later on to cover biology (GuruTutor), research ethics (HURA Advisor), critical thinking in science (Operation ARIES), self-regulated learning (MetaTutor), and other subject matters or skills (Padayachee, 2002; Online Education, 2016). Georgia Institute of Technology introduced a virtual teaching assistant, Jill Watson, to handle the online discussion forum of a graduate-level computer

science class in knowledge-based artificial intelligence. Jill answered questions from learners as they came in, learners were not able to distinguish between Jill Watson and other human teaching assistants at the end of the semester (Tyagi, 2020).

Adaptive or Personalized Learning

The extensive use of technology in learning facilitates the collection of real-time data which could be analyzed via AI to further enhance the learner's experience according to his/her progress, needs, characteristics, and preferences making learning more personalized and adaptive and facilitating the achievement of learning outcomes. Hyper-personalization is a concept used by Amazon and Spotify and widely used in marketing, it leverages machine learning and real-time data to draw inferences and tailor content, assistance and services to match desires and requirements, hyper-personalization can be applied in education. It can be used to design a customized learning profile for each individual learner and to tailor-make their teaching and learning materials, taking into consideration the learner's ability, experience, and progress on an individual basis (Squirrel AI Learning, 2021). SquirrelAI is an adaptive learning system fueled over 2,000 learning centers in over 300 cities across China. As learners navigate through a subject, SquirrelAI's system tracks their progress, and determines when they're ready to push ahead or step down. SquirrelAI claims to be effective at helping struggling learners get back on pace and learners who excel to push ahead further (Gupta, 2020). Carnegie Learning leverages cognitive science to offer customized tutoring and live feedback for post-high school learners, Carnegie Learning assesses keystrokes and allows the tutor to view the learner's progress (Rangaiah, 2020).

AI-powered Voice Assistance

AI-powered voice assistance has been used by many top companies in a variety of industries like Mercedes-Benz, Pandora, Snap, and Mastercard to offer branded voice experiences to enhance user engagement, brand affinity, safety, and convenience. Some universities tried the use of voice assistants to facilitate interaction with educational material. Voice assistants can be effective in offering instantaneous and convenient access to answers for all common questions regarding campus and the teaching and learning environment, they can also be customized for the particular program or courses of each learner. This can help to enhance efficiency and reduce the requirement for internal support. Arizona State University is using voice assistance to provide orientation for incoming college freshmen, Amazon Alexa is used to offer regular and customized information about campus (Sclater et al., 2016).

Digital Content

AI is used to develop customizable learning interfaces and digital content that is applicable to learners of different levels. The content becomes easy to grasp by separating it into coherent chunks, shedding light on integral lesson stuff, summarizing the main points, as well as digitized guides of textbooks, video conferencing as well as video lectures. Audio and video content can also be created. Netex Learning developed a platform that enables professors to develop, manage, and update digital content in a single location which facilitates microlearning, skills mapping, as well

as content recommendations. Content Technologies, Inc. built a collection of smart content solutions for high school and higher educational levels including: Cram101 which leverages AI to offer and explain textbook information into a more comprehensible guide including summaries, true/untrue exercises, and multi-option quizzes and JustTheFacts101 which highlights and formulates summaries by chapter, store them digitally, and make them available to be accessed on Amazon (Rangaiah, 2020; Sclater et al., 2016).

Learning Analytics

With today's massive computational power, large data sets are captured from online processes involved in every aspect of modern living, such data could be subject to a variety of analyses to identify patterns of prior behavior and to predict or propose next actions. Availability of data around learners and their various activities in virtual learning environments enabled learning analytics. Learning Analytics refers to the “measurement, collection, analysis, and reporting of data about the progress of learners and the contexts in which learning takes place” (Gardner et al., 2021). Learning Analytics can be used to improve education outcomes, it can enable, aid or extend the capabilities of educators:

- Allow educators to gain deep insights and make better decisions.
- Help institutions with a better understanding of information on the quality of activities and the educational content and enable continuous enhancement.
- Identify learners at risk and improve learner retention rates, once the at-risk learner has been identified, personalized interventions and support can be planned.
- Assess and act upon differential outcomes among the learner population.

Learning Analytics enables the development of adaptive learning and personalized learning, whereby learners are directed to learning materials on the basis of their progress and previous interactions, content and tasks. Learning analytics provides learners with an opportunity to take control of their own learning and help them to make informed choices about what to study. Purdue University implemented the Signals system using learning analytics to identify retention problems as early as the second week in the semester. Purdue claims that the Signals system led to 14% reduction in the number of D and F grades. New York Institute of Technology uses learning analytics to predict learners as at risk. Several institutions in the UK are deploying learning analytics. A study commissioned by JISC in late 2014 found that early adopters in the UK were driven by a desire to enhance the learning experience for reasons such as improving achievement and reducing attrition, providing better feedback, and empowering learners to become more reflective learners (Gupta, 2020; Gardner et al., 2021).

Automated Assessment

Machine learning and NLP algorithms have been used to automate many assessment and diagnostic systems ranging from candidate and employee psychometric assessments, detection of cancer, to educational assessment. Feature recognition capabilities in AI have been used in automated essay scoring systems and computerized adaptive tests, machine learning and big data offers huge

possibilities in formative assessment. The AI algorithms can be trained to interpret patterns in data, thus, grade assignments and potentially undertake predetermined actions. Duolingo is a language-learning tool that leverages AI to deliver a placement exam. The exam is adaptive, it alters the questions based on the responses provided before, it offers a more straightforward query if the learner failed and a more challenging one if he/she gives the right answer. The complexity of the phrases and grammar used also influences the nature of the exam given. Duolingo also introduced chatbots that conversed with users, and offer appropriate responses based on each correct answer provided by the learner. It also facilitates replies when it's challenging to identify the proper words or grammar (Curriculum, 2022). AI Assess is another intelligent assessment software designed by researchers at UCL Knowledge Lab for science and mathematics: it assesses as learners learn, i.e., it provides activities that assess and develop conceptual knowledge by offering learners differentiated tasks of increasing levels of difficulty as the learners' progress. It also provides different levels of hints and tips to help the learner complete each task (Rangaiah, 2020; Assessment Systems Corporation, 2022).

AI has also been used for automated online proctoring, AI proctoring services record video of learners taking their test and then use machine learning to analyze learners and recognize behavior that looks like cheating. They do this with facial recognition, detection, and eye tracking. During the exam, the instructor is notified, in real time, with any suspicious activity by the exam takers. Examples include ProctorU, Honorlock, AI Proctor, and Proctorio (Assessment Systems Corporation, 2022).

Aiding in Administrative Tasks

Educators are handed a variety of non-teaching duties. AI systems could support dealing with back-office and task-related duties such as grading and facilitating personalized responses for learners. Administrations have also been enjoying the AI benefits by employing intelligent assistants to aid in various complicated admin tasks such as budgeting, admission, arranging learner applications, and enrollments. AI-powered systems can add to the efficiency of educational institutes, reducing their operating costs, and improving user experience (Sahu, 2022).

Enriching the Learning Environment

AI-powered systems and solutions have been aiding in enriching the virtual learning environments and enhancing its global reach. Virtual learning environments can offer group educational experiences, provide learner counselling services, and facilitate an immersive learning experience. VR technologies enable learners to connect to their mobile device or laptop and access content interactively. Learners can coach their colleagues virtually and support the development of their soft and life skills via interactive virtual simulations. AI-powered translators and NLP can make classrooms accessible to all learners irrespective of their language and location (Tyagi, 2020).

Risks and Challenges

It is expected that AI-empowered systems will get more maturity and popularity and continue to be used and expand to other areas of the education landscape. Noting that the purpose behind the

application of AI in education is not to replace faculty members or teachers but to assist them and to give them more time to focus on the intellectual and human aspects. It is worth mentioning that as today's learners will work in a future where AI is the reality, it's important that education systems expose learners to the use of AI technology.

As AI becomes involved in more applications and ever more decisions, there is a danger that important parts of our lives are being made without sufficient scrutiny. Although AI-driven systems and applications will improve our lives, they may still carry risk of unintended consequences or malfunction. There are aspects crucial to be considered before the implementation of AI. In the initial steps of planning and design, administration and developers need to assess the fitness for-purpose, the alignment of AI with the existing environment in the school or university, and the ethical and societal aspects. The administration needs to be clear about what to expect, pre-requisites, limitations, and risks of the AI application. It should plan the change properly and make the transition process seamless for the teachers, learners, and other stakeholders. Managing all aspects related to the change including competency development for faculty and teachers, compensation, intellectual property, information security, and business continuity is crucial for success.

Report Overview

Recognizing the transformative potential of AI, the ICDE Quality Network has developed this report as a key initiative to explore its application in teaching and learning globally. This endeavor underscores the Network's commitment to advancing quality education by promoting the responsible integration of AI.

In preparing this report, the ICDE Focal Points on Quality have contributed insights on the adoption and implementation of AI in education within their respective institutions and regions. Their analyses encompass various dimensions, including the status of adoption, its impact on educational quality, learner experiences, accessibility, and operational efficiency. Additionally, the contributors have identified good practices, risks, and challenges, offering a comprehensive view of the current landscape.

The findings from these regional contributions reveal that AI technologies are being widely employed by educators and learners worldwide, presenting both opportunities and challenges. While adoption varies across regions, the overarching goals of these applications remain consistent: enhancing access, flexibility, efficiency, and delivering personalized learning at scale. The report also highlights region-specific initiatives and good practices that have demonstrated positive impact and hold potential for broader adoption.

As we explore the global perspectives presented in this report, it is vital to remain aligned with our shared mission: ensuring equitable and high-quality learning opportunities for all. The integration of AI in education should not only aim to improve accessibility and efficiency but also uphold ethical principles and prioritize learner well-being. To this end, the report emphasizes the importance of implementing AI solutions in a safe, ethical, and thoughtfully planned manner.

This report seeks to provide a nuanced understanding of how AI is shaping the future of education while fostering a global dialogue on good practices, risks, and opportunities. It invites stakeholders to reflect on the insights shared and collaborate toward harnessing AI's potential to create inclusive and high-quality educational ecosystems.

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AFRICA REGION

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Application of AI in Africa Educational System

Introduction

Africa embraces technology as a means of enhancing learning delivery in the various levels of education. This accelerated after the experience of Ebola and the COVID-19 pandemic. During the pandemic, it was technology that was used to mitigate the unforeseen challenge that hit the educational system though it was not peculiar to Africa. Such technologies included AI driven tools. We shall be discussing the status, impact, challenges and good practices of AI in Africa educational system.

Status of Adoption and Implementation of AI in Education

The use of AI has been on for years especially in the higher educational system. Going by the trajectory, meaningful use of AI was introduced in education in 1920 through teaching machines. This was followed with the development of adaptive teaching machines which was called Self-Adaptive Keyboard Instructor (SAKI) in the 1950s. This was an analog machine designed to teach people how to type on the Hollerith keyboard punch[1]. Between the 1960s & 1970s, Computer-Assisted Instruction (CAI) System was developed. In Ghana, CAI was used to enhance teaching and learning of history in schools[2] with a positive impact on students' academic performance in history. CAI was used to improve educational outcomes and address teacher shortages using digital learning tools in Kenya. The University of Rwanda integrated CAI in Biology education at the Africa Centre of Excellence for Innovative Teaching and Learning Mathematics and Science (ACEITLMS) and positive effects on students' academic achievement was recorded using web applications and computer-based animations[3]. In South Africa, CAI was adopted by schools to support subjects such as mathematics and science, providing interactive learning contents and practice exercises. By 1970, the Intelligent Tutoring System (ITS) was developed.

Although the concept of ITS was first introduced by B.F. Skinner, it was Allen Newell, Clifford Shaw, and Herbert Simon that came up with the modern framework in the 1970s. Kenya used ITS to solve the problem of high teacher to student ratio by using ITS to provide personalized instruction and simulate learning. But ethical issues such privacy and algorithmic bias were of great concern[4]. As an improvement on ITS, the Dialogue-Based Systems (DBTS) including CIRCSIM for medical education was developed in the 1980s. Some institutions in Africa used the AutoTutor which is an outcome of the DBT to help students develop mastery of difficult topics using natural language conversations. The interactivity showed a significant gain over non-interactive learning. The developed student annotations for feedback by IBM Watson Education also helped to improve interaction between learners and their teachers. In the 1990s there was a significant improvement in the application of AI in education. The development of Exploratory Learning Environments (ELE), Learning Apps, chatbots, virtual science labs, and educational games emerged.

From 2000 to date, the use of AI in education has significantly increased. There is advancement of the use of augmented reality, virtual reality, natural language processing, internet of things, and many more. The use of AI in learning and assessment has triggered a lot of discussions. However, there is a significant impact AI has played in education in recent times. Some institutions in Africa like the National Open University of Nigeria (NOUN) uses AI proctoring tool in monitoring examinations remotely. NOUN started the use of proctoring tool in March 2020, and is still in use up to date. This has helped to increase access to learning since the students could take their written examinations anywhere they are. NOUN also uses chatbots and AI tools to increase interactivity in the learning materials. Many institutions in Africa use AI plagiarism checkers for students' research projects, academic papers, and assignments.

To guide the use of AI in teaching and learning, various counties in Africa have integrated AI into their national digital policies. Also, some institutions have started developing institutional policies to guide its usage. In general, AI presents promising avenues for enhancing the learning experience, streamlining administrative tasks, and improving access to educational resources, particularly for remote learners in Africa.

Impact of AI on Quality, Learners Experience, Access, and Efficiency

From the discussions of participants at African AI workshops, seminars, conferences and research papers, it is observed that the resistance of the non-acceptance of the use of AI in teaching and learning was mainly on the fear of losing the quality of learning. The earlier use of AI in education is said not to have affected the skills and abilities of the learners and their teachers. It is seen that using AI in content creation and assessment may affect the quality of graduates that would be produced since the originator of the contents cannot easily be ascertained. There is a general acceptance of using AI to widen access to learning either to attract the increase in the number of students that can be enrolled in a program or course or increase in access to learning and increase in inclusive education. But its effectiveness and efficiency are of great concern judging from the non-availability and inadequacy of digital infrastructure in many institutions of learning and to the learners. What is the cost of providing AI tools and gadgets? It is being expressed that full integration of AI infrastructure in teaching and learning requires a huge sum of money.

I also want to share from the voice of the Association of African Universities (AAU). AAU provides a prestigious platform for networking by higher institutions in Africa. As of 2023, the association has a membership of 421 Higher Education Institutions (HEIs) in 48 African countries with its secretariat in Accra, Ghana. The decision to create AAU was taken in the meeting of Heads of African Institutions of Higher Education in September 1963 at the University of Khartoum. Sudan. Since then, the association network among higher institutions of learning ensuing quality teaching and learning. In celebrating the 2023 African Universities Day, the association met to discuss: AI in African Higher Education where they highlighted some universities in Africa who have "done some work in AI." A research team at Cheikh Anta Diop University in Senegal applied Large Language Models to improve decision-making, policy development, resource allocation and communication. In the same university, another research team led by Dr. Mamadou used ChatGPT-4 to analyze and interpret

epidemiological data, clinical records, and research literature to predict outbreaks, identify priority areas for interventions[6]". This expressed effectiveness and efficiency considering the pull of data involved and the solution it provided. During the sessions, the forum discussion with students revealed that students mostly use AI to do their assignments, research, and for individual learning to get clarity in some difficult topics or terminologies.

Risks and Challenges

Though the use of AI has been accepted largely in the educational system in Africa, there are some challenges and perceived risks. There are two dimensions to the use of AI. Either institutions are adopting or adapting existing AI tools or developing customized tools using AI. So, institutions are either using or contributing to the development of AI tools. There is the challenge of ethical and legal issues relating to educational data and algorithms. There is the concern of the exploitation of data for commercial gains, adequate process of getting the consent of students and staff before using their data, data privacy, algorithmic biases which may undermine basic human rights, and one cannot easily interrogate how AI makes its decisions. There is the risk that learners' data may be misused. Exploitation of data may equally lead to security challenges in educational institutions.

Good Practices

Institutions need to define the ethical boundaries in the collection and use of learners' data because they are more susceptible in this instance. There should be institutional policy that defines the mode of data collection, usage, storage, retrieval, and how students can challenge the misuse of their data. In addition, the ethical implications should be clearly defined. In Africa, most institutions are working towards attaining this.

Recommendations

The use of AI in teaching and learning has come to stay but each institution must define AI pedagogy with details on how it will be utilized in the institution. This calls for retraining of educators on the utilization of the AI pedagogy. Also, educators need to change delivery and assessment techniques to control the envisaged risk of quality reduction in learning.

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MIDDLE EAST REGION

Moustafa Hassan, Vice-Chancellor of International Cooperation, Hamdan Bin Mohammed Smart University

MENA Region Perspectives on the Application of AI in Education

Status of Adoption and Implementation of AI in Education

The MENA region, lacking a standardized definition, includes diverse countries in the Middle East and North Africa. While the boundaries of the region vary, central countries are the focus of this chapter. The MENA region has not been immune to the rapid advancements in AI, which are reshaping educational landscapes globally. The transformative potential of AI in education has sparked growing interest, with stakeholders recognizing its ability to enhance teaching and learning experiences, optimize administrative processes, and address long-standing challenges. According to a recent report titled *Middle East and Africa EdTech and Smart Classroom Market Forecast to 2027*, the market for educational technology and smart classroom tools in the MEA region is projected to expand significantly, growing from approximately $3.5 billion in 2019 to over $7.6 billion by 2027. This remarkable growth underscores the region's increasing investment in technology-driven educational reforms.

While the adoption of AI in K-12 education remains in its infancy, its potential as an assistive tool is undeniable. AI applications in schools can personalize learning experiences, improve accessibility for students with diverse needs, and support teachers in delivering complex subjects like mathematics and science. However, these developments are still in the exploratory phase, with pilot programs and policy frameworks gradually taking shape. Many schools are beginning to experiment with AI tools such as virtual tutors and adaptive learning platforms to enhance student engagement and outcomes.

In contrast, higher education institutions across the Gulf Cooperation Council (GCC) countries are more actively navigating the AI wave. Universities are integrating AI into multidisciplinary curricula, establishing specialized research centers, and forming industry partnerships to drive innovation. This approach reflects a broader trend of aligning higher education with the demands of the Fourth Industrial Revolution.

The growing interest in AI is also fuelled by regional initiatives aimed at enhancing educational access and equity. Governments and private organizations are exploring AI's ability to address issues such as teacher shortages, curriculum standardization, and resource allocation. Furthermore, the pandemic-induced shift to online and hybrid learning has accelerated the demand for AI-driven solutions, highlighting their value in providing scalable, flexible, and personalized education.

This chapter, *AI in Action: MENA Region Perspectives on the Application of AI in Education*, explores the distinct trajectories of AI across the MENA region. It aims to shed light on how the region can leverage this transformative technology to meet its educational aspirations.

Good Practices

The following section highlights a few examples of good AI integration in education across the Middle East. New initiatives and successful implementation are being added rapidly highlighting the regions' commitment to rapid adoption of AI in education.

1. **Integration of AI into Educational Curricula:**
    - **GCC Universities, Egypt and Jordan**: Leading universities are introducing AI modules into undergraduate and postgraduate programs, establishing AI-focused programs and research centres.
2. **Executive-Level AI Training Programs**
    - **UAE**: Hamdan Bin Mohammed Smart University offers Lifelong Learning AI courses and certificates to help learners integrate AI into their workflows and decision-making processes.
    - **Qatar**: The Qatar Foundation has launched AI workshops to train government officials and executives in national digital transformation strategies.
    - **Kuwait**: Kuwait University offers AI certification programs in partnership with global tech firms like IBM and Microsoft.
3. **Higher Education and AI Research Initiatives**
    - **Oman**: Sultan Qaboos University has launched AI-driven labs to provide hands-on experiences for students, promoting a deeper understanding of AI technologies.
    - **UAE**: The establishment of the Mohamed bin Zayed University of Artificial Intelligence (MBZUAI) in 2019 marked a global milestone as the first graduate-level, research-based AI university.
4. **AI Integration in K-12 Education**
    - **Saudi Arabia**: The KITMEK project, the region's first interactive digital school with AI teachers, is expanding pilot programs to deliver personalized learning experiences for students.
    - **UAE**:
        - **Smart Learning Programs**: The Ministry of Education has implemented AI-powered learning management systems to enhance education delivery and efficiency.

    - **AI Teacher Assistants**: Private schools are piloting AI assistants to support teachers in delivering interactive lessons.
- **Jordan**: AI applications are deployed experimentally to track student progress in K-12 schools and recommending tailored interventions to address specific learning needs.
- **Egypt**: The Digital School initiative uses AI to provide access to education for students in rural and underserved areas, helping bridge the gap in educational equity.

Impact on Quality, Learners' Experience, Access and Efficiency

The integration of AI in education across the MENA region has begun addressing long-standing regional challenges, particularly in enhancing the quality of education in resource-constrained and conflict-affected areas. For example, Egypt's Digital School initiative leverages AI to deliver consistent, high-quality education to students in underserved regions, tackling disparities in educational quality. These initiatives demonstrate how AI is being deployed to raise the standard of education, even in regions with unstable conditions, by standardizing curricula and ensuring equitable access to resources.

Furthermore, AI tools have the potential to transform the learning experience for students in the MENA region by personalizing education and supporting diverse learning needs. In Lebanon, where economic instability and the refugee crisis have strained educational resources, AI-powered platforms can enable personalized learning for students affected by these challenges, ensuring they receive focused support. This example highlights how AI can foster an engaging and inclusive learning environment despite the complex challenges faced by many MENA countries.

Administrative efficiency is a priority area for MENA countries to address the resource constraints and the rapidly growing populations. Oman's deployment of AI tools for resource allocation and scheduling helps optimize administrative processes, ensuring schools operate smoothly despite strained resources. Saudi Arabia's investments in e-learning platforms highlight how AI can scale education delivery to meet the needs of growing and geographically dispersed student populations. These initiatives demonstrate AI's ability to increase access to quality education and improve operational efficiency, even in regions facing significant socio-political challenges.

Recommendations

The following recommendations provide a strategic roadmap to optimize AI adoption in education across the MENA region while addressing regional challenges and promoting equitable access:

1. **Enhance Educational Quality and Personalization**
   Scale AI initiatives like KITMEK and Egypt's Digital School to improve personalized learning outcomes and standardize curricula.
2. **Integrate AI into Curricula and Teacher Training**
   Expand AI modules across universities and schools and provide comprehensive teacher training.

3. **Improve Access in Remote and Conflict-Affected Areas**
   Strengthen infrastructure to support AI platforms in underserved regions.
4. **Invest in Research and Partnerships**
   Build AI research centers and collaborate with global tech leaders to drive innovation.
5. **Streamline Administrative Processes**
   Deploy AI tools to optimize school operations, allowing educators to focus on teaching.
6. **Foster Executive-Level AI Training**
   Broaden leadership training to ensure strategic AI integration.
7. **Develop Ethical Frameworks**
   Establish regional guidelines for data privacy, transparency, and ethical AI use.
8. **Support Scalable AI for Hybrid and Remote Learning**
   Institutionalize AI-driven platforms to enhance flexibility and reach.
9. **Promote Regional Collaboration**
   Encourage cross-border partnerships to share best practices and align AI strategies.
10. **Expand Lifelong Learning Programs**
    Leverage AI for workforce reskilling and economic resilience.

These recommendations provide a strategic roadmap to optimize AI adoption in education across the MENA region while addressing regional challenges and promoting equitable access.

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ASIA REGION

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Status of Adoption and Implementation of AI in Education in Asia

Introduction

The adoption and implementation of AI in Asian Distance Higher Education Institutions (DHEIs) vary significantly across the region. The following are examples reported from Asian Association of Open Universities' (AAOU) member institutions. Starting from Indonesia, Universitas Terbuka (UT) has embraced AI across key areas, including student registration, teaching and learning, and assessments. To enhance the registration process, UT has implemented Generative AI in partnership with the Tomoru Application, deploying an AI Voice Chatbot to guide and assist students throughout the registration journey. In the teaching-learning process, UT is in the final stage of piloting the implementation of AI in the learning process across various subjects, including 1000 asynchronous classes and 60,000 students through an AI-Assisted Tutor. The implementation is centered around discussion forums and the assignment process, where the human tutors act as validators and editors of the feedback or scores provided by the AI-Assisted Tutor. UT has also utilized AI in the assessment process.

Figure 1. Focal Point for Quality Network in Asia Promoting Digital Education Exchanges through AAOU Collaboration.

In Malaysia, Open University Malaysia has successfully developed an AI-powered chatbot. This AI-driven innovation has recently integrated ChatGPT to improve user experience, offering

personalized learning and real-time support. In the Philippines, University of the Philippines Open University (UPOU) has embraced AI in academic fields such as automated academic essay scoring utilizing neural regression models. UPOU has also published a guideline on the use of AI in teaching and learning. In Pakistan, the use of AI has been promoted by Allama Iqbal Open University (AIOU) in the form of a three-day workshop collaborated with Commonwealth of Learning (COL) to 256 faculty members from 37 public and private universities in a hybrid format.

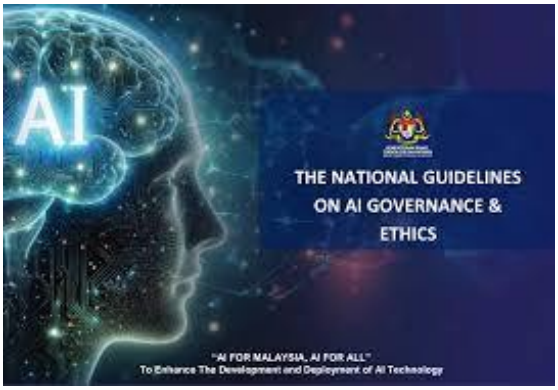
In Turkey, Anadolu University, which offers both conventional and distance education, has adopted an AI-based Virtual Assistant for its registration process. This Virtual Assistant operates 24/7, providing responses to user inquiries and addressing the high demand for support via telephone and a Question-Answer system. The Open University of China (OUC) has developed OUC's AI-powered English listening and speaking platform in China. The platform showcases word pronunciations and situational dialogues and delivers detailed scores for students' pronunciation, along with valuable suggestions for improvement. The AI evaluates each sentence for grammatical accuracy and suggests improved phrasing for English essays, enabling students to learn anytime and anywhere.

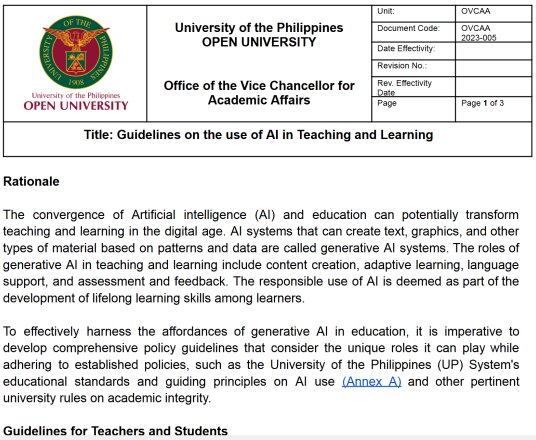
Impact on Quality, Learners Experience, Access, and Efficiency

The integration of AI in registration, teaching, learning, and assessment processes has significantly influenced quality, learner experience, access, and efficiency.

Impact on Quality

Regarding quality, it has highlighted the need for ethical frameworks or guidelines to govern AI usage. In the Indonesian context, the Ministry of Education published an Indonesian language version of a guideline for AI utilization in higher education in October 2024. In the Philippines, as mentioned earlier, UPOU has published a guideline on the use of AI in teaching and learning. Similarly, in Malaysia, the government published national guidelines on AI governance and ethics through the Ministry of Science, Technology and Innovation (MOSTI). In Türkiye, the Ministry of Higher Education announced groundbreaking guidelines for ensuring the ethical use of Generative Artificial Intelligence (GAI) in scientific research and publication processes in early 2024.





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Title: Guidelines on the use of AI in Teaching and Learning

Rationale

The convergence of Artificial intelligence (AI) and education can potentially transform teaching and learning in the digital age. AI systems that can create text, graphics, and other types of material based on patterns and data are called generative AI systems. The roles of generative AI in teaching and learning include content creation, adaptive learning, language support, and assessment and feedback. The responsible use of AI is deemed as part of the development of lifelong learning skills among learners.

To effectively harness the affordances of generative AI in education, it is imperative to develop comprehensive policy guidelines that consider the unique roles it can play while adhering to established policies, such as the University of the Philippines (UP) System's educational standards and guiding principles on AI use (Annex A) and other pertinent university rules on academic integrity.

Guidelines for Teachers and Students

Figure 2. Samples of Guidelines on Using AI in DHE in (from left to right) Indonesia, Malaysia, and the Philippines.

Impact on Learner Experience and Access

Several studies on the implementation of AI in education have been conducted in Asia. In Türkiye, regarding the implementation of Virtual Assistant, they carried out a satisfaction survey involving 374 participants as the sample and subsequent focus group discussions with 18 users aimed to delve deeper into students' satisfaction levels vis-à-vis user expectations. Findings indicate a moderate level of satisfaction among users with the Virtual Assistant application. AI-enhanced assessment implemented at UT enables students to access and do the test from their home, office, or other places as long as they are connected to the Internet and supported devices. This technology enables UT to check and monitor students' validity, environment, and movement during the test.

Impact on Efficiency

At Universitas Terbuka, the integration of AI into the registration and teaching-learning processes has notably enhanced resource efficiency, particularly in managing the availability of tutors for general courses such as Indonesian language, religion, civic education, and general English. Additionally, it benefits learners by saving time, money, and energy, as they can complete assessments conveniently from their own location.

Risks and Challenges

One of the risks and challenges for DHEIs in implementing Virtual Assistance or AI Voice Chatbots is frequently updating the data used to train generative AI, ensuring it remains aligned with emerging trends, cases, challenges, and issues. That process requires high cost because it involves substantial investment in infrastructure, training, and maintenance. Challenges in implementing an AI-Assisted Tutor lie in training the generative AI with course-specific data, calibrating response times to ensure interactions feel natural and adaptive, and ensuring that students complete tasks and submit answer sheets based on their own abilities. A significant challenge in implementing AI in the examination process is the technological infrastructure, particularly internet connectivity, which remains inaccessible in certain parts of the region, especially in archipelagic countries with many frontier, outermost, and underdeveloped areas.

Good Practices

Several initiatives have been conducted to implement AI in Asian DHEIs in various areas, i.e., registration, teaching-learning, assessment processes, and administration services, as mentioned in the previous section above. Other initiatives in implementing AI in education have also been carried out through collaborative research projects, conferences/webinars, and workshops. Governments and DHEIs have also published guidelines on using AI in higher education in the Asian region. These good practices show a strong commitment from relevant stakeholders in Asia to respond to the advancement of DHE through the adoption and implementation of AI.

Recommendations

The adoption and implementation of AI in distance higher education should be supported by collaborative initiatives, including joint research and publication projects, seminars, conferences, workshops, benchmarking activities, and the exchange of best practices among Asian stakeholders (such as DHEIs, associations, and governments) in collaboration with global networks like the ICDE. These recommended efforts aim to facilitate a smoother and more efficient integration of AI into the daily operations of DHEIs.

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EUROPE REGION

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European Perspectives on the Application of AI in Education

Introduction

The release of ChatGPT in 2022 has caused significant disruptions across various fields in society, including higher education, prompting discussions about the applications and implications of Generative AI (GenAI). In response, higher education institutions were compelled to rapidly develop institutional principles and guidelines to regulate the use of GenAI by students and teaching staff, particularly concerning assignments, thesis work, and examinations for that academic year. Concurrently, awareness of GenAI's potential to empower both students and teachers has grown, enhancing the quality of teaching and learning.

The European Association of Distance Teaching Universities (EADTU) actively explores how GenAI can improve higher education processes and outcomes. The organization advocates for a systemic and holistic approach to the educational and ethical use of GenAI and successfully applied for a European-funded project in early 2023 to create a comprehensive educational and ethical reference framework for its thoughtful integration into teaching and learning design. This project has already resulted in reports analysing the use of GenAI practices and policies, along with an initial literature review covering the years 2022 to 2024.

Key stakeholders in the adoption of GenAI include students, who need to develop AI competencies for deep learning; teachers, who incorporate GenAI into course design; and institutional educational and IT support services that assist in integrating research and innovation into educational practices. Institutional leaders are responsible for establishing policies and frameworks for GenAI integration, while national authorities and the EU provide broader regulations, such as the Ethical Guidelines on the use of AI and Data in Teaching and Learning for Educators (European Commission, 2022) and the European AI Act (European Commission, 2024). Within the EADTU framework, all these stakeholders play important roles at various levels.

Institutional Principles and Guidelines

In response to the immediate challenges presented by ChatGPT related to student assignments and examinations shortly after its launch, universities needed to quickly adopt principles and guidelines to adapt to the new circumstances. An interdisciplinary working group at KU Leuven was formed to develop initial institutional principles for the use of generative AI (GenAI) in education, bringing together experts from fields such as artificial intelligence, language technology, ethics, law, education, and research to ensure a comprehensive approach.

Based on the work of this group, KU Leuven created extensive guidelines tailored for three target groups: students, professors, and researchers. The guidelines are continuously updated to reflect new developments in education and technology. serving as a comprehensive and representative document for the university community. The university adopts a responsible and transparent strategy towards GenAI, opting not to ban its use. In the regulations, students are reminded not to compromise educational and examination regulations, professors are encouraged to communicate transparently about the AI use, and researchers are urged to disclose their use of GenAI in publications, project applications, and doctoral theses, aligning with existing frameworks such as the European Code of Conduct for Research Integrity (Allea, 2023) and the EU Guidelines on trustworthy AI (European Commission, 2019). Furthermore, on its website, KU Leuven is offering information and online training modules on various GenAI technologies, alongside open resources from other universities. Face to face workshops on topics such as conducting literature reviews, performing data analysis through AI, or creating effective prompts are organised. The initial approach adopted by KU Leuven has inspired numerous other European universities.

The Community for Learning and Innovation of the University of Rotterdam offers guidance on using ChatGPT and other AI tools for education and learning. Tilburg University has developed an e-module for students on the responsible use of GenAI in higher education.

The Open University provides guidance for students on responsibly and effectively utilizing GenAI. It encompasses understanding GenAI and its tools, ensuring safe usage, advising its use as a complement to OU materials and interactions with peers and tutors, and defining in which cases GenAI can be used appropriately in assessments. Students are cautioned that while Generative AI can be a valuable resource for their studies, excessive reliance may impede their learning opportunities.

UNED (Spain) has developed comprehensive guidelines for integrating Gen AI into teaching and learning (UNED, 2023). These guidelines introduce various GenAI tools, highlighting the opportunities and challenges they present while providing strategies for their integration into distance education. They outline how GenAI-based tools can support teachers, assist students, identify the technical and legal limitations of GenAI, and emphasise the need for universities to reconsider their assessment methods.

The publication "A Teacher's Guide to ChatGPT and Remote Assessments" by UniDistance Suisse aims to assist educators in understanding ChatGPT's capabilities and limitations, and to provide guidance on integrating this AI tool into teaching practices and online examinations. It offers strategies for redesigning assessments to ensure they remain secure, fair and provide the assessment of envisaged learning outcomes.

These are examples of frontrunner universities in the uptake of AI, but still many European universities have yet to publish institutional principles and guidelines regarding the use of GenAI on their websites. Some institutions limit their focus to regulations governing the misuse and abuse use of GenAI, outlining basic do’s and don’ts. However, these regulations fall short to empower students,

staff, and researchers to fully leverage the opportunities that AI offers while avoiding potential risks. Currently, only front-runner institutions seem to adopt a constructive understanding and use of GenAI within systemic educational frameworks. Achieving this necessitates a more comprehensive approach to education that incorporates both educational and ethical considerations.

Towards A Comprehensive Educational and Ethical Framework

The European Union supports initiatives to anticipate the challenges and opportunities GenAI offers to various sectors, including education. With the support of a European grant, EADTU coordinates under the ADMIT project (2024-2027) the establishment of a comprehensive, multi-level framework for the use of generative AI (GenAI) in higher education, integrating educational and ethical considerations. This framework should enable universities to enhance the quality and maturity of the adoption of GenAI in higher education.

ADMIT contributes to the recent Manifesto in GenAI in education, indicating “when it comes to GenAI in education, educators must thoughtfully redesign their learning processes, curricula, and assessments while preserving academic integrity” (Redefining Educational Practices and Assessment) and “While GenAI may promise significant educational innovations, strategies must be grounded in rigorous, evidence-based research” (Potential for Educational Innovation) as well as considerations related to Ethical Use and Fairness, Accessibility and Inclusivity, and Enhancing Cognitive Capacity (Bozkurt et al., 2024).

The framework is also designed to accommodate future advancements in AI technologies and educational paradigms, including social generative AI systems for education as discussed by Sharples. This approach aims to foster cognitive interactions between humans and AI, creating various opportunities for the Web to serve as a platform for social learning among both humans and AI (Mike Sharples, 2023).

ADMIT is composed of multiple partners across Europe: EADTU (coordinator), Anadolu University (Turkey), Dublin City University (Ireland), Fernuniversität in Hagen (Germany), Fernstudien Schweiz (Switzerland), Hellenic Open University (Greece), KU Leuven (Belgium), Open University of Cyprus, Open University of the Netherlands, the Open University (United Kingdom), Stifterverband für die Deutsche Wissenschaft (Germany), the University of Jyvaskyla (Finland), UNED (Spain), Uninettuno (Italy, Universitat Oberta de Catalunya (Spain), and the University of Pisa (Italy).

The consortium of European universities analyses effective practices and policies within the partnership, alongside diverse resources including research literature, innovation reports, conference proceedings, and webinars, the project tackles the challenges associated with implementing GenAI technologies. These studies establish a solid orientation base for developing a reference framework accompanied by guidelines that aim to improve teaching and learning.

The framework adopts a multi-level approach. At the micro-level, heuristic guidelines will demonstrate how GenAI can enhance various learning activities, such as knowledge acquisition, investigation, knowledge building in collaborative settings, practice learning, and productive learning in essay writing. This approach, informed by the analysis of practices and policies and the review of

the literature, adds significant value for both teachers and learners by systemizing GenAI competencies and incorporating them into established design models like ABC-LD, Carpe Diem or 4CID. This integration creates a robust multiplier effect, enhancing educational practices across European higher education institutions and globally.

At the meso-level, the reference model empowers teaching and learning services and IT support to assist teachers and institutional leaders in policy development while ensuring the necessary ethical conditions for GenAI implementation. They bridge the gap between institutional policies and frameworks (macro) and teaching.

At the macro level, the reference framework will generate leadership recommendations to guide institutions in developing appropriate policies and strategies for GenAI implementation, ensuring the necessary educational and ethical conditions are met.

Furthermore, the project explicitly develops a taxonomy of ethical issues associated with the use of GenAI in higher education. They will address key topics such as the use of GenAI-generated content, academic integrity, and legal implications. Ethical issues related to generated content include concerns about bias, discrimination, stereotypes, and adherence to European values, including human dignity, human rights and equity. This highlights the need for students to continuously evaluate the content generated. Ethical questions around academic integrity relate to the potential misuse or abuse of GenAI in assignments, essays, and exams. It raises questions whether GenAI can be utilized and if proactive measures should be implemented during assessments. A further ethical category concern legal issues, including possible copyright infringement, privacy and consent, discrimination, and the use of student data.

The taxonomy of ethical issues and guidelines will be integrated into the GenAI-Ed reference framework to ensure a comprehensive approach to these concerns.

As teachers and leadership need to be familiar with the vast educational potential of GenAI, the partnership will develop open licensed course modules on GenAI in higher education for the continuing professional development (CPD) of teaching staff, support services and leadership for implementing GenAI in education.

With all this, EADTU also wants to serve national and European digitalization policies, the European Digital Education Action Plan, and national higher education systems. This will involve participating in EU, national and regional consultations.

Current Trends in Practices and Policies on the Use of GenAI

A first ADMIT report examined the awareness, challenges, and opportunities related to GenAI among stakeholders, including students, teachers, and administrative staff during 2023-2024 (Koçdar et al., 2024).

To achieve this, both quantitative and qualitative data were collected in the partnership on the adoption of GenAI. Questionnaires were completed by 16 administrative staff, 27 IT support staff,

1,284 students, and 315 teachers. Additionally, semi-structured interviews were conducted with 13 administrative staff, 13 IT support staff, 60 students, and 54 teachers.

At individual level, awareness of AI technologies varies among students, teachers, and IT/support staff, with both teachers and students relying on self-directed learning and experimentation with tools like ChatGPT. While IT/support staff generally have a higher level of familiarity due to their involvement in technical projects, the absence of structured training leads to inconsistent knowledge across individuals. Currently, AI is mainly used experimentally, with students leveraging it for brainstorming and writing, while teachers use it for research and instructional content creation. Despite the potential benefits of enhancing productivity and enabling personalized learning, concerns about ethical dilemmas, over-reliance on technology, and the decline of critical thinking skills persist. For IT/support staff, data privacy and security challenges complicate the broader adoption of AI technologies.

At the institutional level, awareness of AI is often fragmented, driven by specific departments or proactive faculty members. While some universities have initiated informal workshops, many lack cohesive policies to promote awareness and encourage the widespread adoption of AI technologies. Current AI applications are largely limited to pilot projects and niche implementations, highlighting financial, technical, and organizational barriers that impede scalability. Furthermore, challenges such as staff resistance, ethical concerns, and issues surrounding data privacy and equitable access complicate the integration of AI in educational settings.

National policies tend to recognize the transformative potential of AI but often lack the detailed guidelines necessary for addressing educational needs effectively. National-level support is underdeveloped, focusing primarily on ethical issues and data security rather than practical educational implementation. A supportive environment for effective AI integration in education has to be created.

Systematic Literature Review

The ADMIT project also conducts an annual systematic literature review to examine the evolving awareness, perceptions, and use of generative AI (GenAI) in higher education (Bektik et al., 2024). This review highlights global trends in adoption and the attitudes of different user groups, while also addressing the challenges and ethical considerations of integrating GenAI into educational practices, including assessment methods. A rapid evidence assessment approach (PRISMA) was utilized, compiling both peer-reviewed and grey literature published between January 2022 and October 2024, culminating in 112 relevant articles.

The findings from the literature review reveal mixed attitudes among stakeholders. Gen-Z students show optimism regarding the benefits of GenAI, such as improved learning efficiency and personalized experiences, while educators from Gen-X and Y express ethical concerns and advocate for guidelines. Challenges such as diminished critical thinking, plagiarism risks, and data privacy issues also emerge as significant concerns. Furthermore, while (GenAI) has the potential to promote equity by offering resources for non-native speakers and underserved students, concerns exist

regarding the risk of widening inequalities for those without access to premium tools. The report emphasizes also the need for universities to develop comprehensive policies to facilitate responsible AI use, with varying impacts across disciplines and applications in specific areas like healthcare and STEM.

As institutions begin implementing policies on the ethical use of GenAI, they focus on preventing plagiarism, rethinking assessment approaches, and ensuring equitable access to AI tools. Collaboration among disciplines is essential in formulating these policies, while various countries work on national regulatory frameworks to balance AI innovation with ethical oversight. Examples include the UK's non-statutory AI regulation framework, the EU's AI Act, and the U.S. executive order on AI, highlighting a collective commitment to addressing the ethical implications of AI in education.

Areas for further investigation and innovation

Based on this research, the report has identified several key areas for further investigation and innovation regarding the use of generative AI (GenAI) in higher education.

First, there is a need to develop effective pedagogical models and strategies for integrating GenAI into educational design and practices. While AI tools have the potential to enhance learning efficiency, evidence-based strategies for incorporating these tools into the curriculum remain underexplored, particularly in teaching students how to engage critically with GenAI.

Second, enhancing AI literacy and promoting critical engagement are needed. Future studies should assess the impact of GenAI tools on critical thinking, creativity, and deep learning. Teaching students how to question AI-generated content, assess its validity, and recognize the limitations of these systems, as this understanding is a key condition for maximizing the educational benefits of GenAI.

Third, there is a pressing need to balance AI innovation with ethical considerations to ensure the responsible implementation of GenAI in education. Institutional frameworks should be developed that promote innovation while maintaining ethical conditions. This includes addressing critical issues such as academic integrity, data privacy, algorithmic bias, equitable access to technology and student well-being.

Lastly, while GenAI has been widely adopted in STEM fields, there is a necessity to explore tailored strategies for the humanities, social sciences, and arts. More research should focus on identifying specific applications, challenges, and benefits of GenAI in these fields and on understanding how GenAI can benefit students in non-technical fields.

Conclusions and Recommendations

The launch of ChatGPT in 2022 has significantly disrupted various sectors, including higher education, leading to important discussions on the applications and implications of GenAI. EADTU, under the ADMIT project, actively investigates how GenAI can enhance processes and outcomes in higher education. It aims to establish a comprehensive, multi-level framework for the use of generative AI (GenAI) in higher education, integrating educational and ethical considerations.

To effectively integrate GenAI into education, a comprehensive approach is needed that entails both educational and ethical considerations. Currently, only front-runner institutions are adopting a constructive understanding and application of GenAI integrated in systemic educational frameworks, indicating a disparity in readiness among universities.

At the individual level, mixed attitudes towards the adoption of GenAI emerge among stakeholders, with Gen-Z students expressing optimism about its benefits, while educators from Gen-X and Y voice ethical concerns and call for clear guidelines. The individual use of AI is primarily incremental and experimental, with students using it for brainstorming and writing, while teachers harness it for instructional content creation and for research.

At the institutional level, awareness of GenAI for education is often fragmented, driven by specific departments or proactive faculty members, which impedes the scalability of AI applications within and across universities. Institutional policies on the ethical use of GenAI focus on preventing plagiarism, rethinking assessment approaches, data privacy, and ensuring equitable access to AI tools.

There is a need to develop effective pedagogical frameworks and strategies for integrating GenAI into educational design and practices, taking into account ethical criteria. National-level support for AI implementation remains underdeveloped, focusing predominantly on ethical issues and data security rather than educational applications.

There is a pressing need for further research into effective pedagogical models for integrating GenAI in higher education, with an emphasis on enhancing AI literacy and critical thinking and balancing educational innovation with ethical considerations.

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LATIN AMERICA AND CARIBBEAN REGION

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AI Adoption and Implementation in Latin America and Caribbean

Introduction

AI has become a transformative agent for education, guaranteeing an innovative landscape with vast potential. Globally, the adoption of AI in education is marking a paradigm shift in teaching-learning systems, with significant implications on the quality, access and efficiency of the educational process. However, this advance is not without risks and challenges, highlighting the need for strategic and ethical approaches to its implementation. The following is an analysis of the current state of adoption of AI in higher education in Latin America and the Caribbean, its impact, associated risks and good practices that can guide the way towards a more inclusive and innovative educational future.

State of adoption and implementation of AI in education

The degree of adoption of AI in educational systems varies significantly between countries and regions, depending on factors such as technological infrastructure, educational policies and access to financial resources. In our region, Latin America and the Caribbean, the digital divide continues to be a major obstacle to the implementation of this technology; specifically, due to the lack of access to devices, limited connectivity and the absence of technological skills among teachers, leading to a slowdown in the progress of AI and its uneven implementation.

Despite this, global, regional and HEI initiatives have focused on the integration of AI in education, with the aim of guaranteeing quality, inclusive and equitable education. Although in our region the panorama is heterogeneous and its implementation is more incipient, the initiatives seek to transform higher education, especially, they have become an impulse for distance and online education, modalities that have experienced exponential growth, especially after the COVID-19 pandemic. In this sense, AI is not only a driver of innovation for distance and online education, but also drives the creation of more inclusive and resilient educational environments that respond to the demands of the 21st century.

In this regard, in order to have a clear vision of the current state of AI in the region, we will take into consideration the Latin American Artificial Intelligence Index (ILIA) developed by the Economic Commission for Latin America and the Caribbean (ECLAC), in collaboration with various institutions and experts in the field of AI. This index is a tool that evaluates the state and development of AI in 19 countries in Latin America and the Caribbean, and is elaborated with the objective of providing a detailed analysis of the situation in the region, covering aspects such as infrastructure, research, public perception and policies related to AI.

The ILIA is composed of dimensions, sub-dimensions, indicators and sub-indicators, which provide a structured and comprehensive view of the AI ecosystems in the countries of the region. Specifically, it covers three dimensions: Enabling Factors, Research, Development and Application (R&D+A), and Governance, 9 sub-dimensions, 20 indicators, and 76 sub-indicators. The ILIA of 2024 is shown below, established for 19 countries, and according to the level of development they present in relation to AI, either: Pioneers, Adopters and Explorers.

Figure 1. Latin American AI Index (Taken from: ILIA, 2024, p. 12).

According to Figure 1, Chile, Brazil and Uruguay are currently the leaders in the development of AI in Latin America, standing out in several of the indicators evaluated, either: technological infrastructure, specialized human talent, scientific productivity and innovation, which evidences the focus of their national strategies for the strengthening and expansion of technologies in various sectors of the economy and society.

Similarly, the results of the sub-dimensions related to Enabling Factors, Research, Development and Application (R&D+A), and Governance reveal that Chile, Brazil and Uruguay stand out as the leaders in the region, obtaining the highest scores in various sub-dimensions of the index. These countries not only outperform the regional average, but also establish themselves as role models in the implementation and development of policies related to AI. Their success is attributed to a combination of factors, including significant investments in research and development, as well as an innovation ecosystem that promotes collaboration between the public and private sectors.

On the other hand, it is essential to recognize the remarkable performance of Mexico and Argentina, which, although they do not reach the levels of the leaders, show considerable progress and are in a competitive position. Both countries are implementing strategies that could catapult them to more prominent positions in the future, thanks to their growing investment in human talent and technology.

However, the report also notes that Cuba, Honduras and Bolivia have the lowest scores in the dimensions and sub-dimensions evaluated. This indicates a basic level of management in AI, characterized by minimal structures and a lack of investment in the development of technological capabilities. These nations face significant challenges that require urgent attention, as there are key areas that need substantial improvements in order to advance in the adoption and application of AI effectively.

Impact on quality, student experience, access and efficiency

The impact of AI in education can be seen in several key dimensions. In the teaching and learning process, it is possible to personalize the educational experience, identify areas of improvement in students and offer tailored solutions in real time, through adaptive learning systems, intelligent tutoring systems, virtual and augmented reality, and automated assessment platforms. Undoubtedly, AI allows adapting to the specific needs of each student, identifying areas for improvement and offering materials designed to maximize their understanding, which not only improves academic results, but also fosters a more interactive and motivating learning experience. It is important to note that in this process, the professional development of teachers is fundamental, both in their training and development of digital competencies, as well as in the correct integration of teaching and academic integrity.

In terms of access, AI allows students with different abilities, from disadvantaged communities or remote areas to have access to high quality educational resources through digital platforms, closing inequality gaps. Tools such as machine translation and virtual assistants have expanded educational opportunities for students from different language and cultural backgrounds.

In terms of educational management and administration of HEIs, data generated through AI tools can improve the effectiveness and efficiency of their planning and operation, from admissions management to student services. The successful integration of AI requires not only adequate technological resources, but also effective training and cultural change within institutions.

In the field of research, it collaborates with the production and management of knowledge and allows greater efficiency in data collection and analysis. However, it is crucial to address the ethical challenges that arise with its implementation, ensuring that technological progress is used responsibly and equitably, to maintain originality in the production of knowledge.

And with respect to educational quality, it is pertinent to establish that AI is the necessary pedagogical complement to improve and promote it. For this reason, UNESCO (2021) states that:

The deployment of AI technologies in education should aim at improving human capabilities and protecting human rights for effective human- machine collaboration in life, learning and work, as well as for sustainable development.

Therefore, the implementation of AI in education has great potential to transform and improve the quality of education by introducing personalized and data-driven approaches that respond to the specific needs of each student. This technology not only provides teachers with competitive and

functional tools, but also optimizes the teaching process by facilitating more effective coaching. In a context of constant communication, educators can use AI to monitor student progress and provide real-time feedback, which fosters a more dynamic and collaborative learning environment. Ultimately, the integration of AI in education empowers teachers and enriches the learning experience, making education more inclusive, accessible and effective.

Risks and challenges

Despite its many advantages, the implementation of AI is not without risks, and one of the main challenges is the digital divide, which limits access to these technologies in developing countries or in communities with insufficient technological infrastructure. Without equitable access to devices, internet and digital skills training, the lag is evident.

It is important to highlight that the lack of digital skills in both teachers and students hinders the effective adoption of these tools. Therefore, as HEIs in the region advance in the adoption of these technologies, it is essential that public policies and regulatory frameworks accompany this process, encouraging investment in technological infrastructure, teacher training and digital literacy of students. Only in this way will it be possible to take full advantage of the transformative potential of AI, making higher education in Latin America and the Caribbean a key factor for sustainable development and social justice. Another imminent challenge is the lack of adequate training for teachers, who must not only familiarize themselves with the use of technological tools, but also with the pedagogical aspects involved in the use of AI.

Similarly, it is worth noting that AI is being rapidly implemented in education systems regionally and globally, offering the potential to improve and expand learning. However, this rapid adoption also carries risks, such as the lack of regulatory frameworks to protect students and teachers, and the need for a human-centered approach when using these technologies. Hence, another risk is over-reliance on AI technologies, which could dehumanize the educational process and reduce social interaction between students and teachers.

Another major hurdle is data privacy and security. AI systems in education collect large amounts of personal information about students, raising concerns about the misuse of this data and the need to ensure its protection under strict regulations. In addition, algorithmic decision making, if not properly monitored, may be biased, replicating existing discriminations or inequities in traditional education systems.

AI also presents a significant challenge in the area of sustainability because, although it has the potential to optimize resources and improve energy efficiency, its development and operation require a considerable amount of computational resources that contribute to the carbon footprint due to the emission of carbon dioxide and other greenhouse gases. It is therefore of great importance to design a more efficient infrastructure, using energy- efficient technologies and sustainable data centers that minimize the ecological impact. The reduction of emissions generated by computational processes and the adoption of renewable energy sources are key steps to ensure

that AI is not only a tool for progress, but also an engine for global sustainability that is governed by policies and regulations that promote transparency and equity in the use of AI.

It is therefore crucial to address ethical and equity issues in the implementation of AI- based solutions, ensuring that the benefits of AI are not only concentrated in certain regions or groups, but are distributed fairly, thus promoting a more sustainable and equitable future for all. Thus, UNESCO has established some recommendations on the ethics of AI, addressing the following areas of action: ethical impact assessment, governance and ethical management, data policy, development and international cooperation, environment and ecosystems, gender, culture, education and research, communication and information, economics and labor, and health and social welfare. Such a framework aims to ensure that AI is used in a way that promotes human welfare, fundamental rights and social justice by advocating for transparency, responsibility and accountability in AI systems, highlighting the importance of avoiding discriminatory bias and ensuring that the benefits of technology are accessible to all. By promoting global and collaborative governance, UNESCO seeks to ensure that the advancement of AI aligns with universal ethical principles and respects human dignity at all stages of its implementation.

Good practices

In Latin America and the Caribbean, HEIs have adopted a series of good practices in the implementation and use of AI, with the aim of improving educational quality and promoting more equitable and accessible development. Among the most prominent practices is continuous teacher training in digital competencies, which allows teachers not only to become familiar with the new technological tools, but also to learn how to integrate them effectively into their pedagogical methods. In addition, strict policies on data protection and transparency in the use of AI have been established to protect the privacy of students and teachers, and to foster trust in the use of these technologies.

Another key aspect is the generation of government and institutional initiatives aimed at reducing the digital divide, facilitating access to technology and ensuring that all sectors of the population have equal opportunities in education. In parallel, intuitive and accessible tools are being developed for both teachers and students to improve the educational experience and enable more effective use of AI in teaching and learning.

Finally, the promotion of inter-institutional cooperation is essential to ensure that technological solutions are appropriate to the real needs of the educational system, which implies strengthening alliances between universities, governments and companies, creating an ecosystem of collaborative innovation that allows the development of educational projects with an inclusive and sustainable approach.

Considered together, these best practices not only seek to improve academic quality and performance, but also to ensure that the use of AI in higher education is ethical, inclusive and aligned with the social and technological challenges of the region.

In our region, the hard work of several HEIs stands out, as is the case of Brazilian universities, which have implemented AI initiatives in distance education platforms that allow students to interact with virtual tutors, receive instant feedback and adapt to their learning pace.

In Mexico, the National Autonomous University of Mexico (UNAM) through the Coordination of Open University and Digital Education (CUAED), presented the AI Assistant, a virtual tool designed to assist teachers, with the purpose of analyzing pedagogical concepts that favor the optimization of the educational process. Another best practice developed by Tecnológico de Monterrey is TECgpt1, a generative AI ecosystem that aims to adapt teaching to the individual needs of students, optimize learning, stimulate teaching creativity and reduce the time teachers spend on repetitive tasks.

Similarly, in Chile, the Pontificia Universidad Católica de Chile has designed an educational platform dedicated to AI, called Academia IA, which benefits the entire university community, whose objective is to enhance digital skills and promote learning in the field of AI, providing various resources for its application and development.

Another notable example is in Colombia, at the Universidad Nacional Abierta y a Distancia (UNAD), who implemented VictorIA, which represents a step towards the digitalization of academic management, not only simplifying administrative processes, but also guaranteeing a more efficient, personalized educational experience aligned with the needs of students and faculty.

These are some of the best practices developed by Latin American HEIs, and more and more are implementing initiatives that not only favor academic development, but also contribute to educational innovation and equity, allowing more students to access quality education, regardless of their location or social context.

Recommendations

Although the implementation of AI is inevitably transforming higher education and some countries in the region have made significant progress, there is still a long way to go. Based on ILIA 2024, only seven of nineteen countries evaluated have official strategies to effectively integrate AI. For this reason, it is necessary that all countries in the Latin American and Caribbean region take full advantage of the various opportunities and functionalities that AI offers to promote quality, inclusive, ethical and sustainable education; allowing the integration of these technologies in a strategic way, ensuring benefits reach all sectors of the education system.

Undeniably, the advancement and adoption of AI in a country demands advanced technological infrastructures, leading to the creation of an innovative ecosystem that fosters the development of specialized talent, supports cutting-edge research and promotes continuous training programs to ensure that the workforce is prepared for the challenges presented by this technology.

One of the main recommendations is to carry out effective governance that promotes public policies aimed at fostering digital literacy and ensuring access to technological infrastructure (especially in rural or marginalized communities), all with the aim of reducing the existing digital divide and promoting digital transformation.

Likewise, it is essential to promote digital literacy, allowing students and teachers to receive training in digital skills that will enable them to take advantage of AI tools effectively. Similarly, teachers should receive continuous training in the pedagogical use of AI, as well as in the ethical and social aspects associated with its implementation.

At the national and institutional level, regulatory frameworks must be established to ensure the ethical, inclusive and transparent use of AI in education, to guarantee the protection of student and teacher data, ensuring that algorithms are auditable and fair.

A key and institutionally supportive factor is the exchange of knowledge and best practices between institutions in different countries and regions, because inter-institutional collaboration not only helps to overcome challenges, but also accelerates the adoption of AI.

Among the additional recommendations put forward in UNESCO's Practical Guide is the need to promote research and its application, adapting it to available resources. It is also essential to foster interdisciplinary and intersectoral discussion spaces that facilitate active collaboration among the various stakeholders. It is also essential to fund interdisciplinary AI research and to encourage cross-border collaboration in this field. Finally, it is crucial that quality assurance processes in higher education be updated to incorporate ethical principles related to AI, thus ensuring comprehensive and responsible training in this field.

In conclusion, AI has the potential to profoundly transform education, both globally and in Latin America and the Caribbean. However, for this transformation to be positive and sustainable, structural and ethical challenges need to be addressed in a comprehensive manner, ensuring that all actors benefit from its advances in an equitable manner.

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NORTH AMERICA REGION

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AI Adoption and Implementation in North America

Introduction

Education in North America had been undergoing a digital transformation well before the emergence of Generative AI (GAI). The region's strategic approaches to technology adoption in education have laid the groundwork for integrating GAI, addressing its potential to enhance administrative efficiency, foster innovation in teaching and learning, and improve equitable access. However, the challenges experienced in earlier digital transformation efforts—such as ensuring equitable access, addressing ethical concerns, and equipping educators with the necessary skills—persist as educators and policymakers work to integrate GAI effectively into educational systems.

Adoption and Implementation

In North America, the integration of AI in education is guided by a growing network of frameworks and initiatives aimed at aligning technological advancements with educational priorities. These frameworks emphasize ethical AI use, data privacy, and inclusivity. Canada has been a leader in developing national AI strategies, with its Pan-Canadian Artificial Intelligence Strategy emphasizing fairness, transparency, and the responsible deployment of AI. In the United States, the Department of Education has provided guidance on the use of AI tools to enhance learning outcomes while ensuring accountability.

Professional Associations have also been providing frameworks for integration of Generative AI. The Online Learning Consortium (OLC), for example, published a *Framework for Comprehensive Design, Equitable Implementation, and Continuous Improvement of AI Strategy*, which offers a structured approach to adopting AI technologies, focusing on fostering a proactive and inclusive culture of innovation. EDUCAUSE, in partnership with Amazon Web Services (AWS), developed a self-assessment tool that helps institutions better understand their current state—and potential future state—of GAI: *Higher Education Generative AI Readiness Assessment*.

Successful AI adoption in North America relies on collaborations among vendors, educational institutions, and government entities. Vendors like Microsoft and Google have partnered with schools and universities to develop adaptive learning platforms and AI-enabled tools. Higher education institutions, including Stanford University and the University of Toronto, contribute research and innovation, while governments provide policy frameworks and funding to support these efforts. This multi-stakeholder approach has enabled the region to make strides in leveraging AI for education.

Opportunities

GAI presents opportunities to provide more personalized and higher-quality educational experiences. Adaptive learning platforms—powered by AI—can tailor instruction to meet the unique needs of each learner, fostering engagement and improving outcomes. Instructors benefit from AI-enabled tools that automate administrative tasks, allowing more time for student interaction and pedagogical planning. Furthermore, GAI can assist instructors in more effectively and efficiently developing content, activities, assessments, and rubrics that engage students in more meaningful ways. Chatbots can be trained to provide students with just-in-time support when instructors or other institutional resources are not available.

AI has the potential to bridge gaps in educational access by supporting learners in rural or underserved areas. Tools like language-processing technologies and real-time transcription services enhance accessibility for students with disabilities and those learning in non-native languages. By reducing logistical barriers, AI supports a more inclusive learning environment.

Higher education institutions have a unique opportunity to integrate GAI into learning experiences that prepare students for a workforce where proficiency with GAI will be a significant advantage—and, in some cases, a necessity. By teaching students to use GAI tools effectively and ethically, institutions empower them to streamline routine tasks, allowing for deeper engagement with challenging concepts and more meaningful learning experiences.

Risks and Challenges

Despite its promise, GAI poses significant ethical risks. Issues such as algorithmic bias, data privacy breaches, and the lack of transparency in AI decision-making processes can undermine trust and perpetuate inequities. Addressing these concerns requires robust guidelines and continuous monitoring of AI applications in educational settings.

Specifically, the debate of AI detection in relation to academic integrity has been foundational at many institutions and informed much of the guidance and policy initially developed, much of what has now been revised as institutions better grasp the complexities of integrating GAI in the curriculum.

Relatedly, the digital divide remains a pressing challenge. While some institutions benefit from cutting-edge AI technologies, others lack the resources and infrastructure to implement these tools effectively. At the student level, some students may have the financial resources to purchase premium versions of AI tools—which provide vastly better features than their free counterparts—giving those students a significant advantage over others. Without targeted efforts to address these disparities, the benefits of GAI may exacerbate existing inequities in educational access and quality.

At the intersection of the debate around AI detection and equitable access is the important finding from researchers in North America that students most hurt by policies are underserved populations—which could be due to inequities in access to detectable AI or other factors (Bowen &

Watson, 2024). Institutions are finding that while AI detection could fit as one part of a response to generative AI, over-reliance on detection as an AI strategy does not make for sustainable growth.

Effective Practices

Canada has been an early leader in ensuring responsible use of generative AI. For example, Canada's Pan-Canadian Artificial Intelligence Strategy serves as a model for ethical AI integration. By prioritizing fairness and inclusivity, the country has established guidelines that ensure AI tools are accessible and transparent. Canadian institutions like MILA (Quebec AI Institute) focus on research that aligns technological advancements with social good.

In Mexico, researchers acknowledge a late start and obstacles to access and preparation of teachers, but they are putting forth innovative ideas on faculty and student partnership using GAI (Onofre, et al. 2024). The initiative described in their multidisciplinary research encourages the development of AI literacies through engagement with AI tools, including developing a practical understanding of AI functionalities, limitations, and ethical considerations. This approach aims to enhance a user's ability to critically evaluate and effectively use AI technologies. They also emphasize the importance of addressing ethical issues, such as data privacy and algorithmic bias, when integrating AI into education.

In the United States, institutions have been keen to experiment with AI while balancing an equitable and inclusive approach to the technology. For example, Arizona State University demonstrates the potential of AI to transform education through partnerships with industry leaders such as OpenAI to develop innovative teaching and learning practices. Another example of a leading university is the Stanford Institute for Human-Centered Artificial Intelligence (HAI). The mission of HAI is to advance AI research, education, policy and practice to improve the human condition. Many US-based initiatives emphasize the role of AI in fostering critical thinking, creativity, and collaboration.

Recommendations

North America should continue to develop comprehensive policies and frameworks that prioritize ethical AI use, data transparency, and inclusivity. These frameworks must include clear guidelines for accountability and address emerging challenges as AI technologies evolve.

Investments in digital infrastructure are critical to ensuring that AI technologies are accessible to all learners. Expanding broadband access and providing funding for AI tools in underserved areas will help bridge the digital divide.

Longitudinal studies are needed to assess the long-term impacts of AI in education. Research should focus on evaluating the effectiveness of AI tools, identifying best practices, and addressing potential drawbacks to ensure sustainable and equitable integration.

Institutions in North America should address the need to prepare their students for a future where generative AI (GAI) will play a pivotal role across many careers. This requires a shift in focus from framing GAI primarily as a tool for academic misconduct to viewing it as an essential competency. By

emphasizing preparedness and fostering intentional use of GAI within students' fields of study, institutions can better support their academic and professional success.

Conclusion

North America is at the forefront of integrating GAI into education, leveraging its potential to enhance learning outcomes, increase access, and improve efficiency. However, the success of these efforts depends on addressing ethical challenges, ensuring equitable access, and fostering collaboration among stakeholders. By prioritizing policy development, infrastructure investment, and rigorous evaluation, North America can set a global standard for ethical and inclusive AI integration in education. The region's commitment to these goals will not only improve education systems but also empower learners and educators to thrive in an AI-driven future.

Design Statement

ChatGPT 4o was used in the writing of this report. While AI contributed significantly to structuring and drafting the report, its role was complementary. Critical decisions about content emphasis, the selection of case studies, and alignment with strategic goals were guided by user input, ensuring the final output reflected human judgment and domain expertise.

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OCEANIA REGION

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Status of Adoption and Implementation of AI in Education: The Use of AI at USP

Introduction

The University of the South Pacific (USP), a 12-nation owned regional university established in 1968 is spread over 300 million square kilometers of sea and over 5 time zones in the Southern Hemisphere. Countries from cultural and linguistic areas of Melanesia, Micronesia and Polynesia are members of its governing body with campuses in all these countries. The remoteness and diversity in connectivity infrastructure naturally means that teaching synchronically is impossible. With its multi-campus set up, the university offers courses in various modes, including Online, Face-to-Face, Print, Flexi, and Blended. Recently, a couple of programmes began testing the use of AI for virtual support. The following provides details of such adoptions at USP.

Semester Zero Using AI ChatGPT

During the COVID-19 lockdown, Pacific Centre for Flexible and Open Learning for Development (PACFOLD) and Centre for Flexible Learning (CFL) approached Commonwealth of Learning (COL) to assist the University of the South Pacific (USP) in hosting a Learning Management System (LMS) platform to provide an online orientation and skills development programme for its potential new learners. The lockdowns' impact on learning, with a possibility of no face-to-face (F2F) orientation programme needed urgent planning to provide USP's potential learners with some awareness, confidence and much more. This led to the development of a free programme, "Semester Zero" that aimed to nurture potential first-year university students, a smooth transition to higher education as well as improvement in students' own mastery and adaptability through the programme. In January 2024, AI-powered GPT was included in the existing Semester Zero programme, providing real-time, 24/7 support on students' queries such as those on USP's Learning Management System (LMS) Moodle, Semester Zero course content, and on various components of the USP Handbook and Calendar. Despite challenges, this tool significantly improved student engagement and support, exemplifying USP's commitment to leveraging technology in education. Its aim was to develop an intelligent online tool capable of providing first-year students with real-time assistance and prompt responses to their queries.

AI is playing a crucial role in the field of education. ChatGPT has made a significant impact in academia, especially among students. The primary function of a chatbot is that it is a computer programme or application that uses voice or text inputs to replicate human communication (Brush & Scardina, 2021). Thus, giving an individual a real-like chat experience.

Chatbots were often straightforward for students to use, which indicates their interest in the course grew. However, it was discovered in the study by Bii et al. (2018) that teachers who used chatbots to

help with their lesson plans found the technology to be helpful in the classroom. The impacts of a chatbot-mediated teaching method on students' computer science learning motivation and performance were investigated in a study by Yin et al. (2020). The study employed quasi-experimental design. Upon completion of the study, it was discovered that the experimental group's students, who learnt through chatbots, had a considerably better level of learning motivation than the control group's pupils, who learnt using a traditional technique.

The idea to deploy ChatGPT in the Semester Zero programme emerged after the introduction of the system in late 2023. The aim was to introduce the system to the potential new regional students who may have little, limited, or no experience engaging with an AI-generated application for learning. The online chatbot system was designed by the USP and COL team to respond to queries regarding enrolment at USP and Semester Zero course. The project was spearheaded by a dedicated team from both USP and COL. The project leads meticulously planned and discussed the contents and manuals to be integrated into the chat interface. Over the course of six weeks, the team held regular meetings to ensure that the system was finely tuned to meet the needs of the learners. This collaborative effort culminated in the successful introduction of USP SEM ZERO-GPT to the target audience. USP SEM ZERO-GPT was designed to provide comprehensive support to over 3,000 potential learners enrolled in the Semester Zero course. The AI-powered chat tool leveraged GPT-based intelligence to address a wide range of queries, ensuring that students received timely and accurate information. The key areas of support included:

- USP Moodle Platform: Guidance on navigating and utilising the Moodle platform, a crucial tool for online learning at USP.
- Semester Zero Course: Assistance with course-related inquiries, helping students understand and complete their coursework effectively.
- USP Handbook and Calendar: Access to information from the extensive 600+ pages USP Handbook and Calendar, offering detailed insights into university policies, academic schedules, and other essential information.

The SEM ZERO-GPT was launched on January 17, 2024. This provided enough time for potential students from the South Pacific region to see what USP has to offer, as well as experience an online programme from the comfort of their home and country, without the stress of having to fly to Fiji to select their study programme. Learners used both the Chat Interface and the Moodle Interface to access the system. Around 66% of queries came from the Chat Interface. This was expected as chatbot provides real-time responses and an interactive platform for learners, rather than requiring them to navigate the system on their own. Around 68% of questions were related to either course or university handbook content.

Learners' interaction since the launch has included more than 430 queries. Both the Chat Interface and the Moodle Interface have been successfully used by the learners to access the system with more than 185 queries on diverse topics. Figure 1 below shows that the nature of queries learners had.

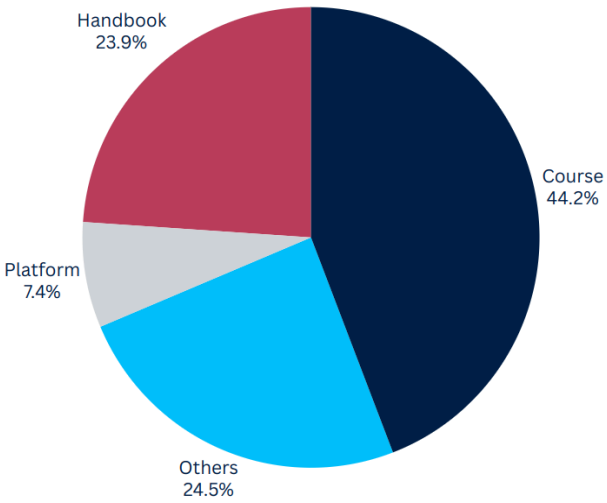

Figure 1: Categorisation of Queries.

Impact on Learners

By integrating USP SEM ZERO-GPT into the learner support system, USP provided potential first-year students with a reliable and accessible resource for their academic needs. Students from any of the 12 USP member countries could access the free online programme and use the AI tool for feedback. This AI-driven tool not only facilitated a smoother transition into university life but also empowered students to navigate their educational journey with greater confidence and ease. It also provided these learners with a pre-university experience of using an AI-generated ChatGPT system. Learners did not have to travel to USP's regional campus, nor email or call staff for additional information regarding courses and programmes offered at USP. SEMESTER ZERO-GPT provided them with responses to their USP-related queries. USP SEM ZERO-GPT stands as a testament to USP's commitment to leveraging advanced technologies to enhance educational support and foster a more engaging and supportive learning environment.

Limitations

As the first implementation of an AI-customised chat tool in a tertiary institution in Fiji, USP SEM ZERO-GPT required extensive testing to ensure its reliability and effectiveness. This process was time-consuming. Additionally, uploading large volumes of content, such as the 600+ page USP Handbook and Calendar, further added to the project's complexity and duration.

Another issue was student engagement for a Non-Compulsory Course. Since Semester Zero is a free and non-compulsory course, encouraging student participation posed a significant challenge. While students from Fiji, where the main campus of USP is located engaged more with the programme, the same was not true for regional students, possibly due to reasons such as connectivity challenges and access to devices to complete the course. To address this, the project team implemented strategic marketing efforts and planned various giveaways to attract students, aiming to

demonstrate the programme's benefits and increase engagement. Regional campuses also promoted the course through their national newspapers, during marketing visits to schools, and on radio stations.

AI in other courses

There are other programmes at USP that use AI for integration in education including the use of ChatGPT and DALL-E to create marketing plans and systems development. These are used in Master of Business Administration (MBA) courses that are mostly taught face-to-face and in blended mode. The use of AI in education in such instances is restricted to mature and mostly self-directed learners.

Another example of using AI in education is in the Social Work courses, which are using AI for virtual assisted role-play simulations. The AI acts as a virtual client (and is pre-trained with tasks), presenting scenarios that mimic real-world social work challenges. Students interact with the AI, practicing their response skills by exploring solutions and receiving immediate feedback. This setup helps bridge theory and practice, providing a valuable experiential learning tool. Again, the use of AI is in courses that are offered to continuing students who are familiar with the LMS as well as the requirements of the use of AI for assessments.

USP, through its CFL also designed and offered a workshop for its academics on the use of AI in teaching (https://elearn.usp.ac.fj/course/view.php?id=3429). Titled "The integration of Artificial Intelligence (AI) in education", it offers academics at USP the opportunities to equip them with practical knowledge and skills to leverage AI tools in their teaching practice. Using a blended format, it combines online and face-to-face activities, allowing the academics to have a comprehensive learning experience, enabling them to explore, apply, and reflect on AI technologies in education and at the same time, they stay informed about emerging trends in AI and are part of the university's community of practice.

Conclusion

The deployment of the USP SEM ZERO-GPT by USP, in collaboration with the COL, has significantly enhanced support for first-year students at a regional university that is spread over a vast geographical distance. Providing face-to-face responses to enrolment queries, as well as providing orientation guidance to potential students, remains a challenge. As such, this AI-customised chat tool provided real-time assistance on various topics, including the USP Moodle platform, course content, and the USP Handbook and Calendar. Despite challenges in testing and content uploading, the system has effectively engaged over 3,000 students, offering 24/7 support and fostering a sense of community and confidence in their academic journey. This initiative exemplifies USP's commitment to utilising advanced technologies to improve educational support and create a more engaging learning environment.

Courses incorporating AI and ChatGPT applications, along with workshops designed for USP academics, demonstrate the university's dedication to promoting the responsible use of AI in

teaching and learning. Although there is still much to be done, these initiatives represent the institution's efforts to foster a shared understanding of AI across the university.

Future Scope

The team that designed the SEM ZERO-GPT is developing a ticketing system, scheduled for deployment in 2025, designed to efficiently address queries by directing them as emails to specialist personnel. This system aims to streamline the process by minimizing internal back-and-forth communication, ensuring that each query reaches the appropriate individual or team responsible for providing a timely response.

Academics are encouraged to attend workshops to gain a better understanding of the use of AI in their courses and to encourage learners to use it for enhanced learning rather than replacing learning. USP is also working on an AI Policy Framework that will address the various implications of AI in its academic setting, as well as for its governance and operations.

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