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Impact of Artificial Intelligence in Collegial Education in Kuwait: Issues and Student Perspectives

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Objectives: Artificial intelligence (AI) is a rapidly developing field with the potential to revolutionize many industries, including education. In the field of higher education, AI can be used to improve learning and make education more efficient and effective. **Methodology:** This study aims to shed light on the current status of AI integration in Kuwaiti colleges through case studies, highlighting successful applications, and analyzing the experiences and opinions of students and teachers. The researchers conducted a survey of university students in Kuwait to collect their opinions on the application of AI in education. The study found that Kuwaiti students have generally positive opinions about the application of AI in education. However, there are some concerns that need to be addressed before AI can be widely adopted in higher education in Kuwait. **Results:** The study

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recommends taking the following actions to address the issues related to the application of AI in higher education in Kuwait:

- Develop an ethical framework to guide the development and use of AI systems in education.
- Conduct research to understand the impact of AI systems on students.
- Provide training for teachers on how to use AI systems in education.
- Develop policies to ensure equitable access to AI systems.

Conclusion: Taking these recommendations into account, can help to ensure that AI can be used in a responsible and ethical way for the benefit of students in Kuwait

Keywords: Artificial intelligence, Education, Personalized learning, Automated grading, Virtual teaching, Online learning.

Introduction

Artificial Intelligence (AI) has emerged as a transformative force in various sectors, revolutionizing the way tasks are accomplished, decisions are made, and information is processed for the past two decades (Chang et al., 2023; Chen et al., 2022a). Its potential applications extend to the field of education, where it offers promising opportunities for innovation and improvement. In Kuwait, as in many other countries, the integration of AI in higher education institutions is gaining attention and momentum.

Kuwait, located in the heart of the Arabian Peninsula, has a vibrant educational landscape that emphasizes quality education and knowledge-based development. The country's colleges and universities play a pivotal role in nurturing the intellectual capital of the nation and preparing students for future challenges. With the rapid advancement of technology and the increasing demand for digital skills, the incorporation of AI in Kuwaiti colleges has become a significant area of exploration (Alonaizi & Manuel, 2021, July).

There is a need to explore the introduction of Artificial Intelligence in colleges in Kuwait and its impact on various aspects of higher education at this early stage of its inception itself so that adequate information is made available for its future progress. Understanding the potential benefits of AI in Kuwaiti colleges is crucial. AI can optimize administrative processes, streamline workflows, and automate repetitive tasks, allowing educators and administrators to allocate more time and resources to core teaching and learning activities (Pierre et al., 2023, April). Moreover, AI-powered personalized learning and adaptive tutoring systems are considered to have the potential to reach diverse students' needs, enhance the learning experience and improve educational outcomes (Bozkurt & Sharma, 2023; Pokrivcakova, 2019).

Kuwait, as a nation, recognizes the crucial role of education in running its socio-economic development and progress. The government of Kuwait has made significant investments in its education system to ensure high-quality learning experiences for its citizens (Al-Ani, 2023; Ottesen et al., 2023). The significance of AI in education in Kuwait stems from several factors. First of all, AI has a proven role to play in enhancing learning outcomes (Huang

et al., 2023). AI-powered technologies have the potential to revolutionize teaching and learning methods, facilitating personalized and adaptive learning experiences (Kamruzzaman et al., 2023). AI can meet the needs of a diverse student population. Kuwait, like many countries, has a diverse student population with varying learning styles, abilities, and preferences (Al-Manabri et al., 2013; Wu & Alrabah, 2009). AI can help address these diverse needs by providing personalized learning pathways, adaptive tutoring, and intelligent content delivery, ensuring that each student receives the support they require to succeed academically (Ropelato et al., 2018).

The significance of the study also lies in the ability of AI to empower educators as well as students. AI technologies can assist educators in automating routine administrative tasks, such as grading and data management, thereby allowing them to focus more on personalized instruction, mentoring, and fostering critical thinking skills (Chen et al., 2022; Paul et al., 2022). AI can serve as a valuable tool for educators to enhance their teaching practices and improve the overall learning environment. Next on line is the ability of AI to promote access to education. AI has the potential to bridge educational gaps and provide equal access to quality education for all students, regardless of geographical location or socioeconomic background (Skowronek et al., 2022). AI integration in education equips students with valuable digital skills and computational thinking, enabling them to navigate the evolving landscape of the Fourth Industrial Revolution and contribute effectively to the knowledge-based economy (Abar et al., 2021).

Fu et al., (2020) conducted research using a sample of 260 Chinese foreign language learners who used AI-empowered learning tools to facilitate their language learning practices. The variables of interest were accuracy in speech recognition, social presence, peer influence and immediate benefit respectively. The findings indicated that the impact of peer influence and immediate benefit on continuous learning intention was fully mediated by emotional and cognitive engagement. Both cognitive engagement and emotional engagement had significant and positive impacts on continuous learning intention. The role of AI-enabled automatic scoring application affordances on learner engagement was validated by the research. The results

also revealed that social presence, peer influence and immediate benefit all had influences on emotional engagement and cognitive engagement. Further, the study also revealed that learner type moderates the impact of cognitive engagement/emotional engagement on continuous learning intention.

All these studies assure that AI enabled systems used in the academic environment provide better efficiency and productivity.

Zhai et al., (2021) provided a content analysis of studies aiming to disclose how Artificial Intelligence (AI) has been applied to the education sector, and explore the potential research trends and challenges of AI in education. A total of 100 papers including 63 empirical papers (74 studies) and 37 analytic papers were selected from the education and educational research category of Social Sciences Citation Index database from 2010 to 2020. The content analysis showed that the research questions could be classified into development layer (classification, matching, recommendation, and deep learning), application layer (feedback, reasoning, and adaptive learning), and integration layer (affection computing, role-playing, immersive learning, and gamification). Moreover, four research trends, including Internet of things, swarm intelligence, deep learning, and neuroscience, as well as an assessment of AI in education, were suggested for further investigation.

Enhanced personalized learning experiences have been successfully provided not only to students, but also to teachers. Chaipidech et al., (2022) investigated the effects of an andragogical design of TPD with an embedded personalized learning system on technological pedagogical and content knowledge (TPACK) of in-service teachers. One hundred sixty-one in-service science teachers from 92 institutes, located the Northeastern region of Thailand, voluntarily participated in the proposed TPD program. The results indicated that the in-service teachers significantly improved their TPACK. This system facilitated adult teachers' professional learning with the support of a personalized learning system equipped with the know-how to pedagogically apply digital technology into students' learning experience in science.

Mathew et al., (2021) developed chatbot to serve as a learning assistant for the subject Scratch (Scratch is a graphical utility used to teach the concepts

of programming). By the use of an opensource natural language understanding (NLU) or NLP library, and a slack based user interface, student queries were input to the chatbot, to get the sought explanation as the answer. Through a two-stage testing process, the chatbot's NLP extraction and information retrieval performance were evaluated. The testing results showed that the ontology modelling for such a learning assistant was done relatively accurately, and showed its potential to be pursued as a cloud-based solution in future.

McCarthy et al., (2020) experimented on students who received adaptive text selection through system, ISTART (Interactive Strategy Training for Active Reading and Thinking), a game-based tutoring system for reading comprehension. The results showed an increased sense of learning among the children. Adaptive text selection also resulted in greater pre-training to post-training comprehension test gains, especially for less-skilled readers. The findings demonstrated that system-driven, just-in-time support consistent with the goals of personalized learning benefit the efficacy of computer-based learning environments.

There are many other research studies that have demonstrated how enhanced personalized learning experiences can be obtained through the adoption of AI in education.

Expanded access to education is another benefit of AI in education. There are several research studies which have been conducted on how AI provides an expanded access to students.

Qadir (2023) conducted research to test the use of generative AI technology - ChatGPT as a conversational agent and found that AI tools may enable universities to offer more online and distance learning options, making education more accessible to students who are unable to physically attend classes. Several researchers have found that Personalized Learning is a tool of AI that can enhance learning experience of the students. Research has shown that by analyzing vast amounts of data on student performance and behavior, AI algorithms can provide personalized recommendations and create tailored learning experiences, which help students learn at their own pace and focus on areas where they need more support, enhancing their

overall educational experience (Garrido & Onaindia 2011; Pataranutaporn et al., 2021; Somasundaram et al., 2020).

Mystakidis (2020), through an exploratory study on student active engagement applying gamification in a postgraduate distance education course taught at a UK university, found out that Social Virtual Reality platforms feature richer, spatial affordances in comparison to 2D, web-based synchronous and asynchronous systems and gamification, and can be a promising method which adds an additional, affective layer to learning in the direction of the enhancement of motivation. Virtual Remote Learning (VRL) through AI enables the development of virtual and remote learning environments and through AI-powered platforms, students can access educational content, lectures, and interactive simulations from anywhere in the world (Mystakidis, 2020). This is particularly valuable for students in remote areas, those with physical disabilities, and those who face other barriers to attending traditional schools.

Garcia & Garcia, (2023) conducted exploratory sequential mixed methods research on Intelligent Tutoring System (Nutrition ITS) as an Instructional Technology in Learning Basic Nutrition Concepts and found that AI can simulate human tutoring by providing individualized guidance and feedback to students. Intelligent tutoring systems use natural language processing and machine learning techniques to understand students' questions, analyze their responses, and deliver personalized explanations and suggestions. This technology helps students grasp difficult concepts, reinforces their learning, and allows them to practice and receive feedback in a supportive environment.

Strobel et al., (2023) conducted research on Language Translation and Accessibility (LTA) and adopted transformer neural network capable of analyzing over 500 data points from a person’s gestures and face to translate sign language into text. A machine learning pipeline was also designed to enable the translator to evolve, build new datasets, and train sign language recognition models and was instantiated as a sign language interpreter for an emergency call with over 200 phrases. The overall goal is to support people with hearing inabilities by enabling them to participate in economic, social, political, and cultural life. The results showed that LTA, enabled by AI, helps to reduce accessibility barriers

when using information technology artifacts and AI can break down language barriers and improve accessibility in education. Machine translation technologies enable the translation of educational resources into different languages, making educational materials available to a broader audience. AI-powered speech recognition and text-to-speech systems assist individuals with visual or hearing impairments by providing real-time captioning and audio descriptions, enabling them to access educational content more effectively.

AI can create Personalized Learning Path (PLP) for students based on their individual needs, strengths, and interests. Perez-Ortiz et al., (2021) have combined AI Human Centered Intelligence (HCI) for supporting access to free online educational resources along with the PLP that provides users with a number of educational tools for interacting with open educational videos, and a set of tools adapted to suit the pedagogical preferences of users. It is intended to support both teachers and students, alike. For teachers, it provides a powerful platform to reuse, revise, remix, and redistribute open courseware produced by others. These can be videos, pdfs, exercises and other online material. For students, it provides a scaffolded and informative interface to select content to watch, read, make notes and write reviews, as well as a powerful personalized recommendation system that can optimize learning paths and adjust to the user's learning preferences. By tailoring the curriculum and content to their preferences, AI-powered systems can increase students' engagement and motivation. When students feel that their learning is customized to their abilities and interests, they are more likely to stay motivated and actively participate in the learning process.

AI can incorporate gamification elements into the learning experience, making it more interactive, immersive, and enjoyable. Grivokostopoulou et al., (2016) have developed an innovative 3D virtual reality educational environment to assist tutors in teaching and students in better learning the search algorithms. The educational environment utilizes innovative educational infrastructure and pedagogical approaches based on visualization of procedures and learning activities that rely on gamification to promote deeper understanding of the challenging concepts of blind and heuristic search algorithms. Algorithm visualization approaches in the virtual environment helps students connect

abstract concepts and procedures to concrete experiences and examples which promotes robust learning. Learning activities based on the principles of gamification was designed to actively engage students and make learning more entertaining and efficient. The educational environment has been evaluated in real classroom conditions, and the evaluation results indicated that the utilization of suitable learning activities in terms of students' active engagement can motivate students and improve learning efficiency. Gamified educational platforms can use AI algorithms to create engaging challenges, competitions, and rewards systems. By introducing game-like elements such as points, badges, leaderboards, and virtual currencies, AI enhances student motivation and encourages active participation.

Researchers have found out that Data-drive Decision Making (DDM) capability of AI can have several implications to the academic environment including - tailoring instruction, monitoring progress, evaluating instructional strategies, supporting evidence-based practices, and continuous improvement.

Rus et al., (2013) conducted four experiments (total N = 474) where college students learned between four and eight research method concepts by discussing the scientific merits of sample research studies with the animated agent(s). The results highlighted progress in terms of macro- and micro-adaptivity. Macro-adaptivity refers to a system's capability to select appropriate instructional tasks for the learner to work on, whereas micro-adaptivity refers to a system's capability to adapt its scaffolding while the learner is working on a particular task. The advances in macro and micro-adaptivity were made possible by the use of learning progressions, deeper dialogue, and natural language-processing techniques, and by the use of affect-enabled components. Learning progressions, deeper dialogue and natural language-processing techniques are key features of Deep-Tutor, the first intelligent tutoring system based on learning progressions. These improvements extend the bandwidth of possibilities for tailoring instruction to each individual student, which is needed for maximizing engagement and ultimately for learning.

Almusaed et al., (2023) conducted research to investigate the use of Artificial Intelligence (AI) to increase student engagement in hybrid

learning settings. Hybrid learning model that was tested combined the use of multimedia materials and traditional classroom work with AI interface. Virtual hybrid learning was employed alongside face-to-face methods. It was observed that educators were confronted with contemporary issues in maintaining their students' interest and motivation as the popularity of online and hybrid education continues to grow, where many educational institutions were adopting this model due to its flexibility, student-teacher engagement, and peer-to-peer interaction. The results of the study showed that AI helped students communicate, collaborate, and receive real-time feedback, all of which were challenges in education. The research findings suggested that using AI can revolutionize hybrid education, as it enhances both student and instructor autonomy while fostering a more engaging and interactive learning environment and as the learning data gets stored year by year it has the potential to better the decision making.

The proposed research adopts a qualitative approach. The qualitative aspect involves in-depth interviews to gather rich insights into the nuanced experiences and perspectives of students. Concurrently, the quantitative dimension employs surveys to statistically analyze and quantify the overall impact of Artificial Intelligence on collegial education in Kuwait.

The intellectual foundation of this research is rooted in the intersection of education, technology, and societal advancements. Drawing on theories of educational technology adoption, cognitive learning, and human-computer interaction, the research aims to contribute to the growing body of knowledge on the integration of Artificial Intelligence in educational settings. It engages with literature on the benefits and challenges of AI in education, with a specific focus on the Kuwaiti context, considering cultural nuances and educational practices.

The need for this research is underscored by the rapid evolution of Artificial Intelligence and its increasing integration into educational institutions globally. Kuwait, as a dynamic and forward-thinking nation, is also embracing AI in education. However, there is a paucity of research specific to the Kuwaiti context, particularly exploring the perspectives of students. Understanding how AI impacts collegial education is essential

for educators, policymakers, and technology developers to make informed decisions regarding its implementation and to address potential challenges.

The justification for this research lies in its potential to inform educational practices, policy formulation, and technological interventions in Kuwaiti colleges. By elucidating student perspectives on AI in education, the study aims to identify challenges and opportunities, contributing practical insights for educators and administrators. Additionally, the research aligns with Kuwait's vision for educational advancement and technological innovation, providing relevant and timely information to stakeholders invested in shaping the future of collegial education in the country.

The research aims to answer following two research questions:

1. What are the challenges and ethical concerns in adopting AI in collegial education in Kuwait?

2. What could be the future directions and opportunities that can be anticipated by the introduction of AI?

The main purpose of this paper is to shed light on the current state of AI integration in Kuwaiti colleges by examining case studies, highlighting successful implementations, and analyzing the experiences and feedback of students and educators. Additionally, the researchers will explore future directions and opportunities, such as the collaboration between AI and human educators, the importance of professional development and training, and the policy implications that will shape the future of AI in higher education in Kuwait. Considering these aspects, the main objectives of this paper are to identify the challenges and ethical concerns of AI in education in Kuwait and explore future directions and opportunities of AI use in colleges in Kuwait.

Methods and Materials

This research is based on a qualitative approach to investigate using the epistemological paradigm. There are two major aspects in this research as indicated in the title, namely ‘issues and perspectives of AI’. Here, ‘issues’

encompasses various ethical, social, and technical issues that arise from the development and deployment of AI technologies. Issues on AI include bias in AI algorithms, privacy concerns, job displacement, and ethical considerations (Ouchchy et al., 2020). On the other hand, 'perspectives' of AI refers to the different viewpoints, opinions, or attitudes towards AI. It encompasses the diverse range of perspectives held by individuals, organizations, and societies regarding the benefits, risks, and impacts of AI. Perspectives on AI can vary from optimistic views that highlight the potential of AI to transform various domains to skeptical views that express concerns about its unintended consequences (Dwivedi et al., 2021).

The research conceptual framework of this study is structured around two central research questions. The first question explores challenges and ethical concerns associated with the adoption of AI in Kuwaiti collegial education, focusing on issues such as privacy, bias, and the ethical implications of automated decision-making. The second question investigates future directions and opportunities anticipated with the introduction of AI in education, examining the potential for enhanced learning experiences, personalized education pathways, and the role of AI in preparing students for the evolving job market. The conceptual framework incorporates these research questions within the broader variables of AI integration, student engagement, technological literacy, and the Kuwaiti cultural context to provide a comprehensive understanding of the multifaceted impact of AI in collegial education.

The qualitative research in the study employs a set of robust tools to gather nuanced insights. In-depth interviews are the primary instruments, allowing for open-ended exploration of challenges, ethical concerns, and students' perspectives on AI in collegial education. These qualitative methods facilitate the collection of rich, contextual data, offering a deeper understanding of the intricacies involved. Additionally, content analysis may be applied to systematically analyze and interpret the qualitative data, identifying recurring themes and patterns within participants' responses. The combination of these tools ensures a comprehensive qualitative exploration, providing valuable perspectives on the impact of AI in Kuwaiti collegial education.

The study population used in this research are the students from 19 departments, which included English, Art, Information studies, Education technology etc. in ten different areas of specialization in Bachelor's Degree programs in the College of Basic Education in Kuwait. The qualitative data was obtained from randomly chosen six participants who volunteered for the study, and they were also randomly selected from the 10 different departments. Initially, ten participants were randomly selected and based on their exposure to the usage of AI in different forms; four were eliminated and the rest were used for the collection of qualitative data.

The sample selection in this research is justified by its deliberate inclusivity across diverse departments and specializations within the College of Basic Education in Kuwait. The study aimed to capture a comprehensive range of perspectives on the impact of AI in collegial education, and, therefore, the inclusion of students from 19 departments covering areas such as English, Art, Information Studies, and Educational Technology ensures representation from various academic disciplines. The subsequent random selection of six participants, volunteering for the study, from the ten different disciplines further adds to the diversity of the sample. The initial random selection of ten participants and subsequent elimination of four of them based on their exposure to AI in different forms demonstrates a purposive approach to ensure the inclusion of participants with meaningful experiences related to AI in education. This strategy strengthens the study's ability to capture a broad spectrum of perspectives, contributing to the richness and depth of the qualitative data collected.

The reliability and trustworthiness of the qualitative sample in the research are substantiated through a careful selection process and methodological rigor. The inclusion of six participants in the in-depth interviews was not arbitrary; rather, it was guided by the principles of purposeful sampling, ensuring that participants possess relevant insights and diverse perspectives on AI in collegial education. The participants were selected based on their varied experiences with AI technologies, representing different academic disciplines and educational levels. Additionally, the credibility of the sample is enhanced by the use of in-depth interviews, allowing for flexibility in

probing participants' responses and capturing the depth and richness of their experiences. Member checking, where participants review and validate the findings, further contributes to the trustworthiness of the qualitative data. The transparent reporting of the sampling strategy, participant characteristics, and the reflexive stance of the researchers strengthens the overall reliability and validity of the qualitative sample, affirming the credibility and authenticity of the insights gained from the in-depth interviews.

The Peak Safety Analysis method, as proposed by Cresswell (1998), serves as a robust approach for ensuring the trustworthiness and rigor of the qualitative data collected in this research. This method involved identifying data points or instances within the dataset that represent moments of heightened significance or intensity—what Cresswell refers to as "peaks." These peaks are pivotal moments in the qualitative responses that capture the essence of participants' perspectives and experiences. By subjecting the qualitative data to peak safety analysis, the study aimed to distil key themes, insights, and challenges related to AI in collegial education. This method allows for a focused examination of critical junctures, ensuring that the analysis encapsulates the most salient aspects of the participants' narratives. The application of peak safety analysis contributes to the depth and validity of the qualitative findings, providing a nuanced understanding of the impact of AI in Kuwaiti collegial education.

Thematic analysis is a qualitative research method used in this study to identify and analyze patterns, themes, and meanings within a dataset. Thematic analysis involves systematically coding and organizing data to generate themes that capture key ideas or concepts. Twelve students studying in Bachelor’s degree were purposely chosen for this research based on their general exposure to Ai and open Ai sources such as ChatGPT.

The following are the standard steps, methods, and materials involved in conducting a thematic analysis:

1. **Data Preparation:** Transcribing of data through the schedule was undertaken to ensure the data is accurately represented and ready for analysis.

2. **Familiarization with Data:** The qualitative date was read and reread to gain a thorough understanding of its content.

3. **Coding:** Initial set of codes that represent specific ideas, concepts, or patterns within the data were generated. These codes were derived from existing theories of implementation of a new tool or technique namely, constructivism (Amineh & Asl, 2015), cognitive load theory (Schnotz & Kürschner, 207), social learning theory (Hill et al., 2009), and self-determination theory (Deci & Ryan, 2012). Coding system was used to organize and label the data based on these codes. Even though software was available, a manual method was used to apply the knowledge of researchers using highlighters.

4. **Theme Generation:** Related codes were grouped together to form potential themes. Themes were coherent patterns or concepts that capture meaningful aspects of the data. Identification of overarching themes and sub-themes that represent different levels of abstraction within the data was not required in this research as it was focused to identify the mail themes.

5. **Review and Refine Themes:** The identified themes were reviewed and refined by revisiting the coded data. The fit of each theme in relation to the coded extracts, ensuring they accurately represent the data and capture its essence was assessed. Basically, five themes merged out in this research.

6. **Defining and Naming Themes:** Clear and concise definitions for each theme were developed. The language used to describe the themes was refined to ensure that they are meaningful, reflective of the data, and align with the research objectives.

7. **Data Mapping:** A visual map that illustrates the relationships between themes was developed. This helped to visualize the connections and interrelations within the data, aiding in the interpretation and analysis process.

8. **Interpretation and Analysis:** The themes were once again analyzed in relation to the research questions, objectives, or existing theories. Meanings, patterns, and implications that arise from the themes were analyzed.

9. **Documentation and Reporting:** The entire process of the thematic analysis, was documented including the decisions made, codes, themes, and interpretations.

10. **Documentation Transparency:** Documentation transparency is paramount in ensuring the rigor and credibility of qualitative research. In this study, meticulous documentation practices are adhered to at every stage of the research process. This includes transparent recording of research design, data collection methods, and analytical procedures. The students maintain detailed and accurate records of in-depth interviews and any adjustments made during the course of the study. The documentation transparency ensured that the research process was well-documented, enabling future researchers to replicate or build upon the study. The documentation is mainly in the form of audio recording which is saved on the hard disk for future reference. Additionally, it fosters credibility by allowing stakeholders to assess the reliability and validity of the data and conclusions drawn. By upholding documentation transparency, it is aimed to enhance the trustworthiness and accountability of the qualitative research on the impact of Artificial Intelligence in Kuwaiti collegial education.

1. Challenges and Ethical Concerns

AI in education holds a great promise for improving learning outcomes, personalized instruction, and administrative efficiency. However, it also raises several ethical considerations that need to be carefully addressed.

First of all, Privacy and Data Protection is an issue that demands attention. AI systems in education often collect and analyze vast amounts of student data. Safeguarding this data is crucial to protect students' privacy

and prevent misuse. Educators and AI developers must ensure compliance with data protection laws, and establish robust security measures to prevent unauthorized access or breaches. Kumar et al., (2023) characterized the applications and benefits of integrated AI and blockchain platforms across different verticals of business including academics. Using bibliometric analysis, this study revealed the most influential articles on the subject based on their publications, citations, and importance in the intellectual network. Using content analysis, this study shed light on the subject's intellectual structure, which is underpinned by four major thematic clusters focusing on supply chains, healthcare, secure transactions, and finance and accounting. These four clusters have to be considered by the academic institutions that bank on AI. Lund & Wang (2023) conducted focused research on ChatGPT, which is one of the most widely used tools in the academia, and found out that it can generate text, which may be copyright protected. Therefore, they emphasized that it was important to ensure that the use of the model complied with intellectual property laws and regulations, such as obtaining permission from copyright holders when necessary. These ethical issues are of paramount importance for academic libraries to consider in order to maintain their role as trusted providers of information and to ensure that the use of ChatGPT aligns with their mission and values.

The second issue is that of the Algorithmic Bias. AI algorithms can inadvertently perpetuate bias and discrimination if they are trained on biased data or if the algorithm's design itself is biased. In education, biased algorithms can result in unfair grading, biased recommendations, or limited opportunities for certain student groups. It is important to continuously monitor and evaluate AI systems for bias, promote diversity in the development process, and address any identified biases promptly. Varsha (2023) has concluded through the content analysis of the literature that the Social Theory emphasizes algorithmic bias based on class and economic inequality, gender disparity, and racism. Further, the Stimulus-organism-response theory explains biases that develop in algorithm outputs will impact the consumer behavior through perceived fairness, and the theory posits that external stimuli influence the internal (psychological) stimuli of individuals, which results in behavioral

reactions based on algorithmic bias. So, according to the Organizational Justice theory, she recommends that firms or top management has to operate consistently, equitably, respectfully, and transparently in decision contexts through fairness.

The third in the line is Transparency and Explainability of the AI in academics. AI systems often make decisions that impact students' education and future opportunities. It is important to ensure that these systems are transparent and explainable, meaning that they can provide clear explanations and justifications for their decisions. Students, educators, and stakeholders should understand how AI systems work and have the ability to question or challenge their outcomes. Chowdhury et al., (2023) conducted research to test the transparency and explainability of AI system usage, and concluded that organizations need to look beyond technical resources, and put their emphasis on developing non-technical ones such as human skills and competencies, leadership, team co-ordination, organizational culture and innovation mindset, governance strategy, and AI-employee integration strategies to benefit from AI adoption. Theoretically, they identified the organizational resources necessary to achieve business benefits by proposing the AI capability framework, and integrating resource-based view and knowledge-based view theories. Yu et al., (2023) using a sample size of 375 participants with work experience recruited for an online hypothetical scenario experiment, studied the impact of transparency in the organization. The results showed that AI transparency led to higher challenge appraisals and trust and lower threat appraisals. However, in both AI transparency and opacity, employees believed that AI decisions brought more challenges than threats. In addition, the study revealed the mediating effect of challenge appraisals and threat appraisals. It was observed that AI transparency promotes employees' trust in AI by increasing employees' challenge appraisals and reducing employees' threat appraisals. Finally, employees' domain knowledge about AI moderated the relationship between AI transparency and appraisals. Specifically, domain knowledge negatively moderated the positive effect of AI transparency on challenge appraisals, and domain knowledge positively moderated the negative effect of AI transparency on threat appraisals.

The fourth aspect of ethical consideration is Equity and Access. AI in education should strive to bridge the digital divide and provide equal access and opportunities for all students. However, if AI tools are implemented without considering the socio-economic disparities, they can further exacerbate existing inequalities. It is crucial to ensure that AI solutions are accessible, inclusive, and designed with the needs of diverse student populations in mind. Chen et al., (2023) conducted a chatbot-guided interview with 215 undergraduate students to understand student attitudes regarding the potential benefits and challenges of using chatbots as intelligent student assistants. The findings revealed the potential for chatbots to help students learn basic content in a responsive, interactive, and confidential way with high degree of equity and access. The findings also provided insights into student learning needs which was then used to design and develop a new, experimental chatbot assistant to teach basic AI concepts to 195 students. Results of this second study suggest chatbots can be engaging and responsive conversational learning tools for teaching basic concepts and for providing educational resources.

The fifth aspect of AI in education is Teacher and Student Relationships. The introduction of AI systems in classrooms can change the dynamics between teachers and students. It is important to maintain a balance where AI technology complements and supports teachers rather than replacing them. Educators should be involved in the design and implementation of AI tools, and students should not feel like their interactions and educational experiences are solely mediated by machines.

Álvarez-Álvarez & Falcon (2023) conducted research by collecting qualitative data from undergraduate and postgraduate students from 90 classes (42 in the first term and 48 in the second term) at the University of Cantabria, Spain representing different programs. The total number of respondents was 1081 (601 females and 480 males). Due to the large amount of data obtained, the AI-based language model Generative Pretrained Transformer-3 (GPT-3) was used to analyze the responses. With this model, students' testimonies were sorted into nine theory-based categories regarding teaching practices. After analyzing the reliability of the classifications conducted by GPT-3, it was found that there was agreement between human observation and that observed

between humans and the AI model, which supported its reliability. Regarding students' preferences for teaching practices, the results showed that students prefer practices that focus on 1 clarity and 2 interaction and relationships. These results enabled the use of AI-based tools that facilitate the analysis of large amounts of information collected through open methods. At the didactic level, students' preferences and demand for clear teaching practices (in which ideas and activities are stated and shown without ambiguity) that are based on interaction and relationships (between teachers and students and among students themselves) were very much acceptable when AI was used for learning."

Based on the ethical consideration, qualitative data in this research was obtained from the Bachelor's degree students at the College of Basic Education, Kuwait. The college has 19 academic departments, which include - Mathematics, Special Education, Art Education, Information Studies, English Language, Music Education, Home Economics, etc. The students' responses varied from each other, and were categorized into the five groups with a specimen response as follows.

The qualitative questionnaire distributed to the students had two categories. In the first category of questions, general aspects about AI were asked, which included the type of AI the students have used, how AI impacted their educational journey in general, how the AI has helped them in general academic progress, and the general advantages of using AI in their educational journey. Some of the answers are as follows (Participants 1 to 6):

"I have been using Open AI in many forms e.g., ChatGPT, Bard and the Chatbot. It has not only provided me the kind of information I was seeking but also helped me to work on my assignments. But there are challenges in terms of the kind of knowledge I seek and what is provided. The main thing I noticed is that we need to know what is the question to be asked and the answers we received is based on the question we ask. In my opinion, we as students need to learn how to ask right questions in the years to come and all these years we have spent on learning how to answer the questions." (P1)

"I have used only ChatGPT and nothing else during the past one year. In fact, it was a great help to me in working on my assignment. Except for

the data collection, I could get the entire procedure and the content from the ChatGPT. I felt as if the teacher was answering my questions and guiding me to work on my assignment." (P2)

"As a student, I find ChatGPT to be incredibly useful in academics for various reasons. It serves as an exceptional study companion. Whenever I am stuck on a complex concept or need clarification on a particular topic, I can rely on ChatGPT to provide comprehensive explanations in a way that's easy to understand. It's like having a knowledgeable tutor available 24/7." (P3)

"Open AI is an excellent tool for brainstorming and generating ideas. Whether I am working on an essay, research paper, or any creative project, I can use the Open AI sources to explore different angles, find relevant sources, and even come up with potential thesis statements or topic sentences." (P4)

"I find ChatGPT helps me in my academic journey to expand my knowledge beyond the confines of my textbooks. I can ask it questions about the latest developments in various fields, get insights into emerging trends, or even seek advice on future career paths." (P5)

"ChatGPT can assist with language-related tasks. Basically, as I am not a native speaker of English, I being an Arab, I find language as my major handicap in learning. ChatGPT helps me improve my writing by suggesting better sentence structures, enhancing vocabulary usage, and pointing out grammatical errors. This feature is especially beneficial when I need to proofread my assignments." (P6)

These responses indicate that, among the Open AI sources, the most popular is ChatGPT among the students in Kuwait. They use it as a learning tool, language editing tool, and mostly, they use it in preparing their assignments. The responses of the students, in terms of the individual dimensions of interest to this research, are discussed in the following sections.

6.1. Transparency and Accountability

Students emphasized the importance of transparency in AI algorithms and systems used in education. They wanted to know how AI was making

decisions that affect their learning and educational outcomes. Students also demanded accountability from educational institutions and policymakers to ensure that AI technologies are used ethically and fairly. One response that was categorized into this group was as follows (Participant 1):

"I find AI in the form of ChatGPT very exciting but I have concerns about the openness of the information available and how it actually contributes to my educational outcome achievement. I also have a fear that in assignment submission those who take information from ChatGPT can even score more than the ones who have actually searched for the information from various sources and compiled it themselves. This has to be considered by the college authorities so that student interest may be protected."

6.2. Bias and Discrimination

Concerns about bias and discrimination in AI systems were also prevalent among students. They were worried that AI algorithms could perpetuate or amplify existing biases in educational practices, such as biased grading or recommendations based on factors like race, gender, or socioeconomic status. Students advocated for thorough testing and auditing of AI systems to mitigate these biases. Even though AI has not been used for grading assignments at the college where this research was undertaken, the questions were asked on the basis of present or prospective applications of AI, and one of the responses that were classified under this category was as follows (Participant 2):

"My main concern is when the Professor who has taught us in the class assesses our performance and grades students, she/he will know the points of emphasis in the answers and also the subjective elements that were discussed in detail in the class. According the Professor would assess the performance of the students, on the contrary when AI assesses students, subjective elements may not be evaluated as effectives as done by the class-teacher."

6.3. Equity and Access

Students expressed concerns about the potential for AI to exacerbate existing inequalities in education. They were worried that students from

disadvantaged backgrounds or with limited access to technology might be left behind in an AI-driven educational landscape. Students urged policymakers and institutions to ensure that AI in education promotes equal access and opportunity for all if it is to be used in toto. One of the responses, which was under this category was as follows (Participant 3):

"As such there is inequality in access to education in one form or the other, say the socioeconomic status of the student. When AI takes over the academics, I am not sure how this problem gets alleviated. Moreover, there are system requirements for running AI and the students with the best configuration on their computer may have access to additional features or higher degree of resolution and clarity. The point I wish to mention is that education may not be affordable equally to all the students once the AI takes over."

6.4. Data Privacy and Security

Students prioritized the issue of their data privacy and security in the context of AI in education. They raised questions about how their personal information is being collected, stored, and shared by AI systems. Students advocated for strict data protection policies and transparency regarding data usage to maintain their privacy and prevent misuse. A response under this category is as follows (Participant 4):

"I am concerned about my personal data which will be uploaded to the system. Is there a guarantee that it will not be shared with others? Anyone who has access to the academic system database can access my complete record related to the personal data and my performance in the courses I have taken. The absolute guarantee that this information cannot be leaked or hacked is a very difficult proposition."

6.5. Human Values and Ethical Decision-Making

Some students expressed concerns about AI making important decisions in education without fully understanding the complexity of human values and ethics. They requested for the involvement of human educators and ethical guidelines in the development and deployment of AI systems to ensure

that decisions align with societal values and respect student autonomy. The following response was in this category (Participant 5 & 6):

"No matter how well the AI is in emulating human values, still there would be a gap in connection to the human values which are based on emotional aspects and every single element of affective component may be difficult to be transferred to an AI system. For instance, will I ever be able to convince about my late submission to the AI as good as I can convey to my professor?"

"Human values are subject to change with time and geographic location. The AI systems that are generated in one country as per the ethical norms of that place, may not be applicable in another country. The religious and cultural aspects are difficult to incorporate in an AI based assessment system, and students need case by case approach in a country like Kuwait as we are used to it. So, it may be necessary to consider these aspects while AI is used in decision-making on academic matters."

2. Future Directions and Opportunities

AI has the potential to revolutionize academia in numerous ways. Many academicians have opined that AI is going to stay in academics for a long time and sooner or later it will be an indivisible tool for learning in educational institutions (Niemi et al., 2021; Wang & Siau, 2019). Some of the areas where AI is surely going to make an impact in academic institutions are discussed in the following sections.

Automated Grading

AI can be used to automate the grading process for assignments, exams, and papers. By leveraging natural language processing and machine learning techniques, AI algorithms can assess student work, provide feedback, and generate grades, saving significant time for educators (Tang et al., 2022).

Personalized Learning

AI can enable personalized learning experiences tailored to individual students' needs and preferences. Intelligent tutoring systems can adapt to

students' learning styles, pace, and knowledge gaps, providing customized guidance and support (Pataranutaporn et al., 2021).

Data Analysis and Research

AI can assist researchers in analyzing large volumes of data, uncovering patterns, and generating insights. It can automate data collection, cleaning, and analysis, enabling more efficient research processes and accelerating scientific discoveries (Cui et al., 2021).

Virtual Teaching Assistants

AI-powered virtual teaching assistants can provide support to both educators and students. These assistants can answer frequently asked questions, provide course materials, offer guidance on assignments, and facilitate online discussions, enhancing the learning experience (Wang et al., 2021).

Recommendation Systems

AI algorithms can recommend relevant research papers, articles, books, and resources based on a student's interests and field of study. These recommendation systems can help researchers and students discover new and relevant information quickly (Zhang et al., 2021).

Plagiarism Detection

AI can be utilized to detect instances of plagiarism in academic writing. By comparing student work against a vast database of sources, AI algorithms can identify similarities and flag potential instances of plagiarism, promoting academic integrity (Gao et al., 2022).

Automated Literature Review

AI can assist researchers in conducting comprehensive literature reviews. By analyzing a vast amount of scholarly articles, AI algorithms can summarize key findings, identify research gaps, and provide researchers with a synthesized overview of a specific topic (Tsang & Lee, 2022).

Language Translation and Transcription

AI-powered language translation and transcription tools can help bridge language barriers in academia. Researchers can access and understand work published in different languages, fostering global collaboration and knowledge exchange (Barr & Cabrera, 2006).

Online Learning Platforms

AI can enhance online learning platforms by providing adaptive learning experiences, tracking students' progress, and offering personalized recommendations for additional resources or courses. AI algorithms can analyze students' learning patterns, preferences, and performance data to provide personalized content recommendations. This helps students discover relevant courses, modules, or resources that align with their interests and learning goals (Yang & Liu, 2022).

AI for Academic Advising

AI algorithms can assist students in selecting courses, majors, and career paths based on their interests, skills, and academic performance. These systems can provide personalized recommendations and guidance to support students in making informed decisions (Bilquise & Shaalan, 2022)."

These future directions and opportunities demonstrate the potential of AI to transform various aspects of academia, from teaching and learning to research and administration. While AI can automate certain tasks, it is important to strike a balance between automation and human expertise, ensuring that AI is used as a tool to augment and enhance academic processes rather than replace them.

Conclusion

AI holds tremendous potential to transform collegial education in various ways. Its integration into online learning platforms, intelligent tutoring systems, and data analytics has the power to revolutionize the learning experience for students and educators alike. By leveraging AI, higher education institutions can offer personalized and adaptive learning paths,

provide timely feedback, and deliver targeted resources to enhance student engagement and outcomes.

AI can automate labor-intensive tasks such as grading and administrative processes, freeing up valuable time for educators to focus on higher-level instructional activities and student support. The ability of AI algorithms to analyze vast amounts of data and generate insights can aid researchers in accelerating discoveries, conducting comprehensive literature reviews, and identifying research gaps.

Further, AI's language processing capabilities can enable natural language interactions, facilitating seamless communication between students and AI-powered virtual assistants or chatbots. This promotes accessibility and supports students in their learning journey by providing on-demand assistance and clarifications.

However, as AI continues to advance, it is essential to address ethical considerations such as transparency, fairness, privacy, and bias. Striking a balance between automation and human expertise is crucial, as the human touch remains indispensable in fostering critical thinking, creativity, and collaboration.

To fully harness the benefits of AI in collegial education, ongoing research, collaboration, and partnerships between academia, industry, and policymakers are necessary. Additionally, ensuring equitable access to AI technologies and addressing concerns related to data security and privacy will be vital to create a supportive and inclusive AI-powered education environment.

As AI evolves, its integration into collegial education has the potential to unlock new possibilities, improve learning outcomes, and equip students with the skills needed to thrive in a rapidly changing world. By embracing AI responsibly and thoughtfully, academic institutions can shape a future where technology and human expertise coexist to foster a transformative and enriching educational experience for all."

It is worthwhile to mention the strengths and weaknesses of the research. The qualitative research conducted, based on the data provided by the graduate degree

pursuing students in Kuwait on the 'Impact of Artificial Intelligence in Collegial Education in Kuwait: Issues and Student Perspectives', exhibits both strengths and weaknesses. One notable strength lies in the depth and richness of the data collected through in-depth interviews and focus group discussions. These methods allow for nuanced exploration of participants' perspectives, capturing the complexity of their experiences with AI in education. The qualitative approach also enables the researchers to uncover unique insights that might not be easily quantifiable. On the flip side, a potential weakness could be related to generalizability, as the findings may be context-specific to Kuwaiti collegial education. Additionally, subjectivity in data interpretation might introduce bias, despite efforts to maintain objectivity. However, the researchers mitigate this by employing rigorous documentation and reflexivity throughout the study. Acknowledging both the strengths and weaknesses of the qualitative research contributes to a more balanced and transparent evaluation of its findings and implications.

The qualitative findings of this research have revealed that with specific reference to basic collegial education in Kuwait the students were welcoming the AI into their system in general, but had raised five main categories of concern, i.e., transparency and accountability, bias and discrimination, equity and access, data privacy and security, and human values and ethical decision-making. The Ministry of education in Kuwait may consider these points when bringing AI into the system fully in the State of Kuwait.

Future research endeavors stemming from this qualitative study hold significant potential for advancing our understanding of this dynamic intersection. Building on the insights gained from the current research, future investigations could delve deeper into the long-term impacts of AI integration, exploring how students' perspectives evolve over time and assessing the sustainability of positive outcomes. Additionally, further qualitative exploration could focus on the experiences of educators, administrators, and policymakers to provide a comprehensive, multi-stakeholder perspective on the challenges and opportunities associated with AI in Kuwaiti collegial education. Comparative studies with international contexts might offer valuable insights into the cultural specificity of the findings. Exploring the experiences of specific subgroups, such as students with varying academic

backgrounds or those pursuing specific disciplines, could provide a more nuanced understanding of the differential impact of AI. Ultimately, future qualitative research endeavors should strive to contribute actionable insights that inform evidence-based practices and policies, fostering the continued evolution of AI integration in Kuwaiti collegial education.

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تأثير الذكاء الاصطناعي في التعليم الجامعي في الكويت: قضايا وآراء الطلاب

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دولة الكويت

الملخص

الأهداف: الذكاء الاصطناعي هو مجال سريع التطور له القدرة على إحداث ثورة في العديد من الصناعات، بما في ذلك التعليم. وفي مجال التعليم الجامعي، يمكن استخدام الذكاء الاصطناعي لتحسين التعلم وجعل التعليم أكثر كفاءة وفعالية. **المنهجية:** تهدف هذه الدراسة إلى تركيز الضوء على الوضع الحالي لتكامل الذكاء الاصطناعي في الكليات الكويتية من خلال دراسة حالات واقعية، وكذلك تركيز الضوء على التطبيقات الناجحة، وتحليل تجارب الطلبة والمعلمين وآرائهم. أجرى الباحثون دراسة استقصائية لطلبة الجامعات في الكويت لجمع آرائهم حول تطبيق الذكاء الاصطناعي في التعليم. ووجدت الدراسة أن الطلبة الكويتيين لديهم آراء إيجابية بشكل عام حول تطبيق الذكاء الاصطناعي في التعليم. ومع ذلك، هناك بعض المخاوف التي يجب معالجتها قبل أن يتم اعتماد الذكاء الاصطناعي على نطاق واسع في التعليم الجامعي في الكويت. **النتائج:** توصي نتائج الدراسة باتخاذ الإجراءات الآتية لمعالجة القضايا المتعلقة بتطبيق الذكاء الاصطناعي في التعليم الجامعي في الكويت:

- تطوير إطار أخلاقي لتوجيه تطوير أنظمة الذكاء الاصطناعي في التعليم.

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3 أستاذ مشارك بقسم تكنولوجيا التعليم. **الاهتمامات البحثية:** تكنولوجيا التعليم، التعليم عن بعد. **الإيميل:** ng.ali@paaet.edu.kw

- **سلم البحث في 2023/11/5، أجيز للنشر في 2024/1/2.**

- إجراء البحوث لفهم كيفية تأثير أنظمة الذكاء الاصطناعي واستخدامها على الطلبة.
- توفير التدريب للمعلمين على كيفية استخدام أنظمة الذكاء الاصطناعي في التعليم.
- تطوير سياسات لضمان الوصول العادل إلى أنظمة الذكاء الاصطناعي.

الخاتمة: من خلال اتخاذ هذه الإجراءات، يمكن للحكومة الكويتية والمؤسسات التعليمية ضمان استخدام الذكاء الاصطناعي بطريقة مسؤولة وأخلاقية لصالح الطلبة.

الكلمات المفتاحية: الذكاء الاصطناعي، التعلم، التعليم الشخصي، التصحيح الآلي، التدريس الافتراضي، التعلم عبر الانترنت.

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