An Exploratory Investigation of the Artificial Intelligence Adoption on Teachers Job Designs

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Abstract: In a rapidly transforming and increasingly digitalized society, interest in artificial intelligence (AI) is growing. Artificial intelligence (AI) has received increasing attention from various areas of culture, industry, and business. AI-based systems will significantly change the nature of the workforce. This study shows that educators should be prepared to adopt artificial intelligence. Integrating artificial intelligence into the education system will require teachers and educators to acquire new skills and update some of them. AI integration transforms the role of the teacher inside the classroom from teacher to facilitator. Integrating AI into education will require educators to be trained in new skills to have a better effect on the outcome of education and educators' careers and life in general. The study addresses the research question: How does AI adoption in schools impact teacher job designs and the skills required? Principal findings emphasize that AI creates opportunities to reframe teachers' skills, yet also poses challenges requiring targeted professional development. This study also shows how some of the activities will be redundant by the AI integration and there will be no need to be done anymore so there will be no asking in those domains which will make these skills obsolete. Future work will explore practical recommendations for educators to manage these shifts and their implications for educational careers.

1 INTRODUCTION

Technological advancements are occurring rapidly challenging the status quo in many sectors including business, internal government as well as education. One of the major components of the digitalization of our societies is the adoption of Artificial intelligence (AI). Artificial intelligence refers to the simulation of human intelligence with machines and its application is gaining momentum in various sectors, (Badghish, S., & Soomro, Y., 2023). One of the key sectors of AI application is education. It is noteworthy that International organizations like UNESCO, OECD, and the World Education Forum are exploring the potential of AI in transforming education experience and outcomes. Specifically, UNESCO explores how AI can improve learning outcomes, presenting examples of how AI technology can help education systems use data to improve educational equity and quality in the developing world (UNESCO, 2019). Inevitably, AI is significantly reshaping the organizational approach and employee skill set requirements. Hence the adoption of Artificial intelligence in education challenges the main job design of the teachers. This study is guided by a structured investigation into how AI impacts teacher roles, focusing on job redesign, required skills, and challenges arising from AI adoption. The introduction of AI education demands a significant pedagogical shift, which calls for new teachers' roles. AI tools assist in identifying students' weaknesses, enabling teachers to target interventions more effectively (Raza, 2023). For instance, educators are increasingly becoming facilitators of learning, (Islam, 2023; Badghish 2023; Cramarenco, 2023) without pointing out specific skills required in the role of teachers in education. Furthermore, the literature does not sufficiently document the impact of AI adoption in education. This study addresses this gap by focusing on the interplay between AI adoption and its effects on teacher job design and skill development. Based on this gap this exploratory investigation aims to

point out the main challenges of artificial intelligence adoption in education and to gain an initial understanding of the skills required to cope with AI adoption. Based on the above aim the following research questions are formulated.

R.Q.1 How does AI in schools impact the job design of teachers?

R.Q. 2 What skills are required by teachers to successfully cope with AI adaptation?

These research questions guide the study in exploring how teachers can navigate the integration of AI in their professional environment, enabling them to adapt to emerging demands. These research questions allow us to explore the new teacher career. Identity and gain an initial idea of the roles and responsibilities. It will also help us validate the new ethos of the teaching career. In addition, we can combine the new skills required to carry on the new role in the era of digitalization of societies.

2 LITERATURE REVIEW

Digitalization has dramatically transformed business operations and challenges the current business models, (Dworschak and Zaiser, 2014). As a result of this phenomenon, many industries are exploring how they can adopt new technologies with great emphasis on Artificial Intelligence. (Islam, 2023). Artificial intelligence is one of the most emerging technologies and today constitutes an essential tool in business models and firms' strategic pillars, (Kinkel, 2022).

Many studies have focused on the applications of Artificial intelligence in the workplace and attempt to provide evidence about the new realities created by this application. The researchers identified essential skills for teachers, including proficiency in basic Word functions, utilizing Microsoft Excel for database creation, conducting information searches on platforms like Google, and maintaining a presence on social networks. The systematic literature review by Lameras & Arnab (2021). Human capital is considered a significant factor in the knowledge economy during the 21st century. Nowadays, possessing only technological skills for professionals is insufficient, and consideration should be given to soft skills too. Since teaching is a complex process, sound knowledge of hard and soft skills is needed for good classroom management (Kumari & Vitharana, 2024). Self-motivated educators are more inclined to pursue continuous professional development, utilizing their social skills to collaborate with peers

and adopt innovative pedagogical approaches (Beltman et al., 2021).

Many governments use Artificial intelligence technologies to increase their productivity, the quality of their services, and its entire transparency (Zuiderwijk, Chen, & Salem, 2021). In the same way thinking (Huang, 2018), notes that artificial intelligence acts as a foundation for innovation and profoundly transforms the services sector. However, the adoption of Artificial intelligence also brings challenges. One of the most crucial challenges in organizations is the transformation of the current job designs. Zhou, explains that AI adoption brings new realities in the job content, as well as the methods of execution of the task. As a result, AI adoption results in new realities and new job demands by employees. An important characteristic of this transformation is the scope of change. Artificial intelligence occurs on task rather than job level. As a result, employees need to cultivate skills to maintain their competitiveness and employability (Huang, 2018). Under this prism, digitalization and AI adoption challenge the education sector as well. Chiu et al. (2023) conducted a systematic literature review to understand the challenges of adopting AI tools in education. They mentioned that many teachers lack an understanding of how these technologies operate, leading to a perceived loss of control and a sense of working with a "black box." This decline in self-efficacy may discourage teachers from utilizing AI support in their classroom teaching. The issue of poor teaching competence among educators has been a long-standing concern, with significant implications for student learning outcomes. Teachers often face challenges in adapting to new pedagogical approaches due to insufficient support from educational institutions (Schleicher, 2023).

The role of teachers before the integration of Artificial Intelligence in Education was more into instruction, lesson plan preparation, content delivery, and classroom management. Teachers' responsibility was to create lesson plans, deliver subject matter, assess student performance, and ensure that learning objectives were met. This traditional role positioned teachers as the primary source of knowledge and authority in the classroom, often functioning within a teacher-centered education model (Cuban, L., 1993).

With AI systems handling many of the traditional tasks associated with content delivery and assessment, teachers are transforming their role from being primary knowledge providers to the new role of facilitators and mentors, guiding students through personalized learning experiences enabled by AI technologies (Holmes, W., Bialik, M., & Fadel, C.,

2019). AI integration in Education will require teachers to have the skills to create individualized learning paths for students based on their performance data and learning styles. Teachers now act as facilitators, guiding students to navigate these customized learning experiences and offering individual support where needed as per their valid data analysis. This transformation has changed the way teachers interact with students, focusing more on individual attention and less on standardized content delivery (Woolf, B. P. , 2010). Teachers require skills to interpret student data to design tailored learning experiences to meet individual needs. (Holmes, W., Bialik, M., & Fadel, C., 2019). Some of these skills are Digital literacy, adaptive teaching skills, learning analytics, and customization of learning paths. Teachers will shift their role to support more and more the mental health and well-being of the students. AI can detect signs of stress or anxiety early or other psychological issues a student might be facing. With the help of AI, some solutions can be recommended, to have a more supportive environment either at home, at school, or even in the community. This will require a new set of skills such as empathy, counseling, Compassion, and collaboration. AI integration disrupts employees' established competence models, raising doubts about whether high-performing individuals can continue to excel in the context of digital transformation (Zhou, Chen, & Cheng, 2024). The integration of AI into the workplace can significantly alter employees' job content, characteristics, and task execution methods, resulting in new job demands (Zhou, Chen, & Cheng, 2024).

Integrating AI in education in pedagogy, design, and assessment will enable teachers to collect huge sets of data that will make it easier to develop dynamic Individual Learning Plans that are customized to students' evolving strengths, weaknesses, and interests. Using data, teachers set goals and track progress, set action plans, and track progress. Individual Learning Plans enable students to have clarity over their learning journey give them visibility on what to expect in the pipeline and provide them with options to adjust and steer as they go forward. (Cukurova et al., 2020).

Teachers will need a new set of skills including coaching, motivation, listening, fostering growth, critical thinking, and mentoring. Teachers must focus on digital and data literacy among students. AI creates lots of data. Teachers must show students how to use this data responsibly. This includes understanding data privacy and the ethical use of technology. Learning and teaching these skills will be imperative

to the education system. This includes teaching skills related to data privacy, ethical use of technology, and critical evaluation of AI-generated insights. (Cukurova, M., Luckin, R., & Baines, E. 2020).

Education will focus more on skills for lifelong learning. Teachers will encourage curiosity and adaptability. Students will be prepared to keep learning throughout their lives. By encouraging a passion for exploration and self-improvement, educators prepare students for future careers and personal growth in an ever-changing world.

3 RESEARCH DESIGN

This study uses qualitative research to explore the discussed skills needed for AI adoption in Education by teachers to have a successful impact on student outcome and their well-being. The interviews allow us to explore the depth of the situation and the problem to understand the new role of teachers, the required skills, and the integration with students. Interviews are powerful tools to conduct in-depth analyses to explore phenomena. When we don't understand the behaviour of people and to understand the context in which these actions occur then we need to delve into the unsaid messages through in-depth interviews. (Kvale & Brinkmann, 2009).

The primary method of data collection is semi-structured interviews with K-12 teachers in the UAE who had exposure to AI integration in education either in their classrooms or in their private space. Participants were selected using purposive sampling to ensure diverse perspectives, including teachers from different educational contexts and levels of AI familiarity. This approach allowed the study to capture nuanced insights into AI's impact across various teaching environments. The interviews were conducted in person or through Zoom. The interviews made the educators share their points of view and experiences with their colleagues. Semi-structured interviews are preferred because they offer a balance between consistency across interviews (by covering key topics) and flexibility (allowing participants to explore issues that are particularly relevant to them) (Kvale & Brinkmann, 2009).

The interviews were guided by questions, codes, and scenarios. At the same time, it allowed for flexibility to let the interviewees express their interests and offer more information to help identify skills or habits that teachers will need in their new role in education.

The interviewees had diverse experiences with AI in education, having used AI for an average of 2

years. Some participants integrate AI into their practice for 4 years. AI tools were used for automating grading, individual learning plans, lesson planning, exam preparation, and correcting essays. Several teachers from secondary education focused on using AI for adaptive learning platforms and real-time analytics to monitor student progress, particularly in subjects like mathematics and science. Meanwhile, elementary and special education teachers utilized AI to differentiate instruction and support personalized learning plans for students with diverse learning needs. Across the board, teachers stressed the importance of transformation and the advantages of AI in reducing administrative burdens, enabling a more student-focused approach, and improving classroom efficiency. In addition, some teachers mentioned that using AI in education gave them extra time to themselves which improved their satisfaction. Educators also expressed that the efforts to learn the new skills were self-initiated they also noted the challenges of acquiring new skills and managing the ethical implications of AI use in education.

4 FINDINGS

With the integration of AI in education with the ability to analyze and simulate large amounts of data and recommend solutions and decisions, teachers are transitioning from traditional content deliverers to facilitators of learning. The teacher will not be the only source of information inside the classroom, information and reasoning will be available at the fingertips of all students. The new role of the teacher will be more focused on how to validate the information and ensure the outcome provided is not based on algorithm bias. Teachers see integrating AI in education as a time-saving tool, this allows them to have more personalized interactions with students. These skills underscore the need for comprehensive professional development programs to prepare teachers for their evolving roles. The results also connect directly to the research questions by illustrating how AI impacts job responsibilities and skill requirements, as anticipated in the literature review.

Some of the new skills required for this new role are facilitation, mentoring, Individual Student support, Autonomy, Active learning, digital literacy, cooperative teaching, and change management.

Supporting Quotes: "AI helps me unravel my work and lets me focus on teaching instead of paperwork.", "I'm now using AI to help structure my

reports, but I always ensure to rewrite and personalize the output.", "I'm no longer just a content provider. My job now is to guide students through their learning journey, especially when AI takes care of the more repetitive tasks."

This highlights a critical gap in the literature that doesn't dive into the psychometric testing of the teachers as this transformation is core. From another perspective, research in the literature review emphasizes the benefits of AI for education, there is insufficient focus on how teachers acquire the necessary skills and there was no consideration of the psychometric testing to use these tools effectively (Holmes, W., Bialik, M., & Fadel, C., 2019). This study shows that structured professional development programs that teach teachers how to use AI tools, interpret AI-generated data, and manage ethical concerns are urgently needed.

Teachers expressed concerns about the ethical implications of AI use as there are no standards for acceptable use. There is a potential for students to misuse AI and get caught by the biases of AI especially when used in assessments. There is a need for clear ethical guidelines and training to highlight and clarify these challenges, ensuring that AI is used responsibly in the classroom by making clear what is acceptable and what is not.

Teachers' responses varied from being AI-supportive to being anti-AI. Some teachers called to have AI exercises to be used as part of the exams whereas others were totally against using technology inside the classroom. Some teachers even called to go back to the pen and paper to ensure that students are not using AI. Ethical use of AI requires skill development for students and teachers, there is no room for judgment and personal reasoning based on personal experience. Educators have also experienced colleagues using AI without proper oversight, leading to poor-quality work. Some of the new skills required for this new role are facilitation, Mentoring, Individual Student support, Autonomy, Active learning, digital literacy, peer learning,

Some of the new skills required for this new role are data security, transparency, and data privacy. Supporting Quotes: "There needs to be lessons on how to use AI ethically. It's a tool, but it shouldn't replace the human element."AI can't replace teachers. We need to check its work and ensure it's used properly."

This finding addresses the gap in the literature surrounding the ethical implications of AI in education. While research often focuses on AI's capabilities, little attention is given to the ethical guidelines needed to manage its use effectively

(Williamson, 2017). This study highlights the need for educational institutions and regulators to develop overarching comprehensive ethical guidelines for AI use, both for teachers and students, to ensure that AI supports rather than undermines learning.

Educators showed that the interaction with students can be more customized and individualized. This provides students with more quality and valuable experience. Interviewees showed concerns that the human interaction might fade away and the communication with students will become robotic. The ability of AI to analyze the outcome of individual students assess their strengths and weaknesses and recommend the best possible plan for the student to be better at increasing the knowledge base and reaching the goal of the learning objective.

Participant Quote: "AI helps me identify which students need help, but I worry about losing the human element in teaching. Sometimes it feels like we're too focused on data and not enough on the individual student."

This finding highlights an important area that has not been thoroughly explored in the literature—the impact of AI on teacher-student interactions. While the literature often extols AI's efficiency and personalization capabilities, this study suggests that teachers value their interactions with students and fear that AI might diminish these relationships (Holmes, W., Bialik, M., & Fadel, C., 2019). This study recommends that AI be used as a tool to complement, rather than replace, these important interpersonal dynamics.

The interviewees expressed that AI has started to help automate administrative tasks, such as lesson plans, grading, creating assessments, and preparing teaching materials. Teachers are increasingly using AI to reduce their workload.

As AI technology is changing daily and new tools emerge, teachers might find it challenging to keep up with technology if they don't have the right skills to do so. The AI tools are very dynamic and teachers need to have continuous agile professional development need to be handy to equip and update teachers on the latest technological inventions or tools to make their lives easier. Supporting statement: "Teachers are using AI to automate administrative tasks such as preparation, grading, and assessment." "So now we are moving the teachers outside their comfort zone by adopting the technology and by adopting AI. It needs a transformation strategy. It's not easy, but it's very rewarding once it's done"

Skills required: digital literacy, information validation, information triangulation, adaptability, continuous learning, and critical thinking. To further substantiate the results, future research could incorporate perspectives from diverse educational stakeholders and compare findings across different regions or international contexts.

5 SKILLS REQUIRED

In the emerging AI-driven era of industrial transformation, the role of the teacher is transforming dramatically from content delivery to facilitation. From a business perspective especially in Human resources-related activities, educators need to be well-equipped to succeed in their new role with the right skills. These skills are to be embedded in the induction, upskilling, and professional development of existing teachers, and at the same time they need to be embedded in the curriculum for teacher colleges.

These skills are divided into Education Administrative skills which include grading that can be done using artificial intelligence that can read directly existing systems, activities, learning platforms, engagement systems, and sentimental analysis algorithms. At the same time attendance tracking automation system automation can be done at the system level using face detection software that can provide live information on the location of the student not only in the classroom but in what part of the school. This system can engage in active communication with parents and students with little guidance from the teachers. Teachers in these cases need to have the required skills to read through these systems and steer the communication with parents or students. In addition, scheduling used to be one of the key tasks that vice principals or tech teachers can skillfully do. Scheduling used to take lots of time to prepare different scenarios with various options to get the most acceptable one by teachers and management. Currently with the use of AI scheduling can be a very simple task that can be done in seconds with various simulation techniques. Scheduling skill is one of the skills that is becoming less important and feeding the information into the system is getting more important.

The role of teachers is dramatically changing from content delivery to facilitation. Teachers' roles are shifting and moving away from standardized instruction to personalized coaching and facilitation. While AI can handle some aspects of content delivery, the teacher's role now includes coaching and facilitating that aligns with individual student needs and individual education plans. This is where active learning techniques come into action.

Evaluation Techniques Skills

The way teachers assess student performance is also evolving leading to better student outcomes if teachers have the right skills to implement. Classroom management skills now involve handling blended learning environments where both in-sitio and digital education tools are available. The education sector can't apply system-wide AI integration without upskilling teachers' skills to be successful. Teachers need to have the right skills to maintain engagement across different formats. Engagement strategies ensure that students are active participants regardless of online or face-to-face format. Differentiated instruction to lead to individual learning plans is one of the dreams of any education system strategist. Differentiated learning as an outcome of personal learning plans has become more accessible with AI. Teachers should know how to analyze data to understand the unique needs of each student and adjust their teaching methods according to individual learning plans. This skill is particularly valuable for supporting diverse learners, including those with special educational needs.

AI's ability to perform predictive analytics further supports teachers' role inside the classroom. Teachers once have the right skills can predict with AI which students might struggle based on their current performance trends, allowing them to pre-emptively intervene. The skill of data interpretation is essential here, as educators must translate data insights into actionable teaching strategies. In Addition, information validation, where teachers should have the skill to guide students in critically evaluating AI-generated content to ensure accuracy and reliability. These skills need to be developed for teachers to be well-equipped to guide the education transformation.

Personal Development Skills

The rapid integration of AI in education demands that teachers develop skills that go beyond traditional lecturing, to support teachers with a strong foundation in digital literacy and AI literacy. Teachers should be upskilled on what AI is, how AI works, its limitations, and potential biases. This is crucial for educators to effectively incorporate technology in the classroom and teach students to use AI tools responsibly and ethically. Furthermore, teachers need to be trained in using digital platforms and resources to enhance pedagogical strategies and leverage them to conduct administrative tasks.Critical thinking remains one of the main pillars of education, but its role has expanded in the digital age.

These collective skills represent a new set to be included in HR-related activities, professional development, ethos, and habits any teacher needs to have. As AI continues to shape the future of education, teachers need to adapt their role to align with the new era. This change requires detailed change management plans. Through this transformation and transition, educators remain at the heart of the learning process not as lecturers as facilitators. We need to preserve human interaction to make learning meaningful and have the technology at the service of humans.

6 SUMMARY OF STUDY FINDINGS

This paper contributes to the study by providing answers to the research question on the impact of the AI integration in education on the teacher's roles, the skill required to have this integration more effective and pleasing for teachers. The set of skills are as follows:

Digital Literacy: Ability to use technology when needed, stay updated, navigate the digital landscape, and continuous and active AI professional development.

Facilitation: Transform the role of teacher from content delivery to facilitation, mentoring, and guidance. The information won't be the challenge anymore but knowing how to get it without biases is more important.

Mentoring: improve emotional intelligence, individualized support, critical thinking, and engaging students through their journeys.

Ethical AI Use: data privacy, overall arching ethical use strategy, system level understanding, logical thinking, algorithm biases and data privacy

Change Management: Embrace the change and shift, transition the role function, adapting to shifts in teaching roles and embracing AI-driven changes.

Active Learning: Encourage engagement, manage groups, keep information flow, interactive learning, flexible and agile learning plans.

Information Validation and Critical Thinking: The ability to validate generated information, teach students how to evaluate AI-generated information, ensure accuracy, and address algorithm biases.

Adaptability: adaptable learning plans updated with the latest advancement, agile enough to get students to the learning objective in the shortest way possible.

By addressing these skills, the study not only fills important gaps on how AI integration can be optimum and efficient but also offers more depth to the literature.

To enhance the practical relevance of the findings, this discussion includes actionable policy recommendations. Schools and policymakers should prioritize structured training programs that equip teachers with the necessary digital and ethical skills to work effectively with AI.

7 CONCUSIONS

The adoption of artificial intelligence (AI) in education is transforming the teaching profession. Educators are required to transform from traditional content delivery to more dynamic roles such as facilitators and mentors. This shift in roles and identity enables teachers to focus on personalizing learning experiences and fostering critical thinking. Educators can rely on AI and automate routine tasks like grading, lesson planning, and tracking student performance and focus on reaching the learning objective in novice ways. To be able to succeed in this transition teachers need to have a fully revised professional development plan for existing teachers and revised education degree programs for new teachers. The new transition needs to be supported by a new set of skills and habits that teachers need to master to succeed in their new roles. In conclusion, AI integration in education has the potential to revolutionize the education system globally. It must be accompanied by comprehensive and continuous training programs, and support mechanisms for educators.

This exploratory investigation contributes to the literature review in several significant ways. First, it is Addressing Gaps in AI Integration and Teacher Training: The study identifies some gaps in the existing literature by highlighting the need to have continuous and agile professional development done at the system level or individual level. The study's findings support the need for targeted professional development programs to close this gap, aligning with recommendations from scholars like (Holmes, W., Bialik, M., & Fadel, C., 2019). Secondly, it Highlights Ethical Considerations and Resistance to AI: Ethical concerns are discussed in bits and pieces in the literature. The system level training is needed

on what is ethically correct and what is not. Currently, in the literature, there is a discrepancy between what is considered acceptable and what is not. Some educators expressed that they can never allow any student to use AI while others were helping students use it. Addressing Skills Gaps and Professional Development Needs: The study contributes to the literature review on skills and competencies required for AI integration. This details specific skills, such as digital literacy, individual learning, data privacy, data validation, ethical AI use, and adaptive teaching. It supports the argument that current teacher training may be outdated and misaligned with the skills needed for the new AI era. This calls for updating professional development frameworks. While this study provides valuable insights into the evolving role of teachers in the future AI era, several limitations must be addressed. The study relied on qualitative data from semi-structured interviews, which are inherently subjective by nature. Quantitative research might be needed to assess these variables at a quantitative level and explore the relationships between them. While this approach allowed for in-depth exploration of teacher perspectives, it may not capture all aspects of AI integration on teachers' roles and skills.

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