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A Review of the hype and hope of AI literacy in UAE higher education

Wafaa ALAKALEEK

The British University in Dubai, Dubai, United Arab Emirates

Wafaa_akleek@yahoo.com

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Abstract. The expeditious merging of artificial intelligence (AI) in all aspects of life, and specifically in higher education, has made AI literacy a core competency for organizational competitiveness, stakeholders' readiness, and sustained learning environments. In the context of the United Arab Emirates, promising national agendas for AI and digital transformation have been established, driven by the advocacy of AI literacy policies at university levels across the country. However, an undeniable question still arises about the institutional coherence and sustainability of the current incorporation of AI systems. This paper aims to provide a comprehensive thematic review of the hype and hope for AI literacy in the UAE, emphasizing the pivotal need for a framework in the UAE's higher education sector. Additionally, to address the associated ethical considerations that arise when higher education deploys AI into its systems. This paper is grounded in the Braun and Clark (2006) thematic model synthesising peer-reviewed scholarly literature, the UAE's national agendas, and some institutional reports. This review's findings contribute a preliminary overview of the optimistic role that AI resources are going to play in the UAE's higher education, as well as a deeper look at the current empirical literature of AI literacy to enhance the substantial understanding of the ethical potentials that AI is going to bring to the table. This paper recommends that higher education authorities must prioritize the implementation of AI ethical frameworks that guide and protect stakeholders, ensure data privacy and ownership, mitigate any potential biases, and ensure teaching and learning equity in higher education. Moreover, this paper recommends increasing the number of methodological studies that incorporate qualitative methodologies to embrace diverse insights, investigate different contextual factors, and illuminate pupils' experiences with AI resources to uncover the subjectivity and interpretations of these resources.

1. Introduction:

With the rapid pace of change and advancement of artificial intelligence (AI) technologies, the world has become a digitally affluent atmosphere where people around the globe use AI tools to maintain their daily chores. Artificial intelligence literacy has become a core competency in communication, work, and learning. Adapting AI in the educational sector sparks debate of critical ethical considerations, such as the learners' cybersecurity, privacy, academic dishonesty, and machine learning bias. Also, hidden impacts on learning, such as dumping cognitive functions to the AI generative [1]. On the other hand, an enormous number of studies revealed that AI technologies have become a prerequisite for pupils to experience individualized learning experiences that empower them to achieve better outcomes and enhance their cognitive and behavioural capabilities [2,3]. Despite the massive threats to the legitimacy and democratisation of AI-based learning technologies, and the autonomous assistance that they offer stakeholders in various aspects [4]. Researchers as well as educators revealed that there is a significant lack of policies that demonstrate the role of AI tools in education and the level of implementation within pedagogical applications, especially within the higher education frame [5]. According to Kong

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(2023), there is a massive shortage in the mechanisms of fostering artificial intelligence (AI) knowledge and skills among society, mainly in the educational sector, including both higher education and K-12. Scholars emphasized the importance of establishing generations that are aware of AI literacy, which will profoundly shift the whole labour market to a fully digitalized workforce [6]. According to Alshamsi et al. (2025), schools' solid understanding of AI technology design and implementation can positively impact the quality of the offered learning experiences and pupils' academic performance. The researchers emphasized the significance of mutual understanding between the public and private sectors in the country, which will lead to achieving the maximum benefits of AI literacy in all aspects [7]. This paper aims to provide a broader thematic review of AI literacy to emphasize the pivotal need for a comprehensive AI literacy framework in the UAE's higher education sector. Additionally, to address the associated ethical considerations that arise when higher education deploys AI resources into its systems.

1.1 Research questions

The proposed study aims to address two research questions shown below:

1. How does literature identify the term "AI literacy"?
2. What ethical potentials will emerge with the deployment of AI literacy in higher education in the UAE?

2. Literature review

2.1 The "Grand Theory-Social Constructivism"

The study will utilize the 'Grand Theory' that explains how humans establish meanings and knowledge through active interaction, relating it to the use of AI in education. Based on the theory, policymakers, technologists, pupils, and instructors interact with the viral technologies of AI, regardless of their social, cultural, or academic background, and they are vigorous participants in constructing an ethical skeleton [8].

2.2 The "Unified Theory of Acceptance and Use of Technology (UTAUT)."

The unified theory is a model that aims to understand the users' attitudes and behaviours when using technology tools. The model was initiated by Venkatesh et al. in 2003. The final model proposed four domains to determine the acceptance of technology usage practices. Moreover, the domains are the effort and performance expectancies, the societal influence, and the facilitation circumstances [9]. The model UTAUT was widely used as a robust initial framework to demonstrate the complexities of artificial technologies integration in various contexts, and it will be used here as a renowned model to explain the higher education stakeholders' anticipations and usage behaviours of AI adaptive technologies to achieve the expected performance and to reflect the undeniable standards of academic ethical commitment.

2.3 Characteristics of AI Literacy Educational Frameworks

Any AI literacy policy should encompass a range of competencies that vary between basic competencies, such as awareness, and advanced ones, such as the creation of new AI tools. An initial framework was created by Su (2024) for kindergarten learners (AI4KGA), emphasizing the importance of early implementations of different levels of literacy to limit the technical divide and offer students diverse learning opportunities. It includes five areas: anticipation, demonstration, intellectualization, natural interactivity, and societal influence [10]. Long and Magerko (2020) proposed another literacy framework that identifies five different themes expressed in the form of questions that align with the areas proposed by Su (2024). The questions were: What is AI? How does it work? What can I use it for? How should AI help? And how do we anticipate AI? [11]. A framework shaped by the international group of AI experts selected and funded by the European Commission and the Organization for Economic Cooperation and Development (OECD). The proposed model of AI literacy competencies for elementary and secondary school levels reveals

that pupils must be equipped with the fundamentals of AI to critically assess the proposed technologies [12]. In the context of higher education, a proposed framework by Allen and Kendeou (2024) included six elements: knowledge of AI, assessment, partnership, contextualisation, self-reliance, and ethics. The more enhancement of these elements will lead to a holistic increase in the approach to understanding and reflecting on how learners acknowledge the role of AI technologies in their academic journey [13].

3. Methodology

3.1 Research Approach

This paper adopts a qualitative thematic approach, employing a systematic exploration of existing literature, conceptual frameworks, and various case studies. This paper aims to review the literature definition of AI literacy and the ethical potentials associated with the integration of AI resources in the UAE's higher education. Additionally, this paper is grounded in the work of Braun and Clarke (2006) segregate the most related studies following the six-phase steps for thematic analysis.

3.1.1 Inclusion and Exclusion criteria

The inclusion process focused on selecting literature, prioritizing peer-reviewed articles published between 2010 and 2025 from reputable journals and conferences, book chapters, case studies, internal governmental reports, and external publications by the IEEE, UNESCO, and the European Commission. Through the literature review, articles were selected based on their relevance to identifying AI literacy, proposing initial frameworks for implementing AI resources in various educational contexts, such as the TPACK and Bloom's models, and empirical case studies that examined the ethical implications of integrating AI technologies in the educational sector. The exclusion process was based on eliminating any study that lacked the appropriate knowledge, empirical, and analytical data-based evidence, and non-peer-reviewed studies that lack institutional credibility.

3.1.2 Data Extraction

Grounded in Braun and Clark (2006), the systematic extraction of core details and information was based on the relevance of selected articles to the review objectives, AI applications in related fields, methodological approach, and anticipated outcomes were

3.1.3 Thematic analysis phases

- **Data familiarization:** to ensure familiarization with the data, the selected studies were read repeatedly to ensure a solid understanding and gain in-depth familiarity with the topic.
- **Initial coding:** the related segments of the text were coded inferentially to identify the significant characteristics related to AI literacy in the UAE higher education.
- **Themes generating:** to create border patterns, initial codes were grouped into potential recurring themes.
- **Theme's validation:** the main themes were identified by ensuring distinction and coherence within and among them.
- **Defining and labelling themes:** the final themes of the study were identified, labelled, and aligned with the main goal of the review.
- **Interpretation and reporting:** the interpretation and synthesis of the review themes were done by ensuring the themes' relevance to the UAE's AI vision and the national socio-economic factors. Main limitations of the current literature-theoretical review were not including any empirical source of data to address the higher education pupils and educators' anticipations of the AI literacy framework on the academic journey or career-wise.

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4. Results and discussion

This section will present and discuss the results according to the two research questions. This extensive review of literature was scanned and discussed to support and enhance the primary findings of the paper. It was noticed that the literature studying AI literacy has increased between 2016 and 2025. A total of 37 studies were reviewed, defining AI literacy and discussing the ethical potential associated with the integration of AI technologies in higher education. The reviewed articles varied between quantitative and qualitative methodologies, and some of the literature used mixed methods to guarantee reflective results, whereas other literature used observation and systematic reviews.

4.1 RQ 1. How does literature identify the term "AI literacy"?

16 out of 37 literature, defined AI literacy as derived from the idea of "literacy". In the 1970s, the expression" digital literacy" was widely emerging to describe the concepts and skills related to computer applications across various industries; it was a required knowledge among individuals who work in jobs related to computer systems. The vital role of digital literacy has increased due to the number of users who depend on these technologies to create new economic and societal opportunities [14]. Literature defines AI literacy as the process of educating pupils how to acquire fundamental knowledge, attitudes, and skills that don't require any prior knowledge. According to Kandlohfer et al. (2016) and Burgsteiner et al. (2016), AI literacy can be conceptualized as the user's ability to recognize the primary concepts and techniques behind the different services and products of AI. Scholars such as Chiu et al. (2024) associate the AI definition with the individual's ability to explain its influence on society and use it in such a way that reflects responsibility and high ethical understanding [15].

This paper adopts the model of "Technological, Pedagogical and Content Knowledge (TPACK)" as a fundamental framework for the AI literacy implementation in the UAE's higher education field. The reasons behind this adaptation were due to the broad usage of this model across various literature, such as Koehler et al. (2013) and Chiu (2025). The model identified the mechanism that educators will use to incorporate the AI technologies within their pedagogical practices and content knowledge to conceptualize their competencies that are required to deploy AI literacy and technologies in an educational context. The TPACK model provides a road map for a comprehensive understanding of AI literacy deployment into education [16]. Another model adopted by this paper was Bloom's Taxonomy and the AI literacy framework. The knowledge and attitudes involved in the AI literacy definition can be mapped to the various domains of cognitive abilities in Bloom's Taxonomy, which is an approach that categorizes the different levels of ordered thinking and reasoning skills of pupils that are required in various educational contexts. The taxonomy contains six levels of thinking and abilities. Each level requires learners to reflect on high-order thinking and reasoning skills. The levels are to be successive, where learners move gradually, and they must show mastery in each level before moving to the next. Furthermore, Bloom's model architecture suggests that AI literacy is a goal that must be achieved in any educational context due to its cognitive classification processes that have not yet been developed to enhance the learning experiences [17]. However, the Bloom-AI literacy model is a classical and pedagogical theory that creates the core foundations of pupils knowledge of AI. This paper views the model in three scopes of cognitive thinking levels: the first level is knowing and understanding AI, the second level is using AI, and the third level is evaluating and creating with AI.

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4.1.1 Intersection of AI literacy with other Disciplines

The framework of AI literacy reflects a mutual relationship with other disciplines that are all relevant to competencies of knowledge, skills, and behaviours. The literacy framework is connected to other areas such as media, computer science, digital literacy, ethics, responsible usage, and critical assessment that are based on a comprehensive awareness of technical design [18]. The interdisciplinary approach reinforces the concept of AI literacy to navigate and restructure the main role of AI technologies across the various disciplines.

4.2 RQ 2

What ethical potentials will emerge with the deployment of AI literacy in higher education in the UAE?

4.2.1 Data privacy and pupils' autonomy

Autonomy and seclusion of learners' data have become quite significant due to the expansion in the e-learning landscape. According to Parsons (2020), despite the constructive learning experiences offered by AI technologies, they cannot cancel the vague ethical dilemma behind these technologies due to the massive number of learners' private data being collected by those technologies [19]. Furthermore, the moment that algorithms begin influencing the mechanism of learning, it becomes arduous to shield learners' autonomy due to their ignorance of the process. Moreover, the massive integration of artificial intelligence into education has transformative visions; however, it poses a significant risk to cybersecurity. A case studied by Nguyen (2022) revealed that a massive volume of learners' information is usually generated by AI tools, and learners will be under the threat of grievous violation of their data. The Researcher emphasized the importance of strenuous data protection that is implemented in informed consent, particularly when used in multicultural educational mediums, where pupils' privacy should be considered properly [20]. Emphasizing the intersection between AI and learners' privacy, Bird et al. (2020) revealed the ethical potentials that are associated with the process of using AI technologies in learning within educational institutions, where devices are utilised by other entities for surveillance, which might be a threat to personal liberties [21].

4.2.2 AI Ethical dilemma

The ethical influence of Artificial Intelligence tools in education is significant due to multiple potentials in data security, exacerbating inequalities of these technologies, and the algorithmic bias. According to Liang et al. (2023), accelerating a literacy framework for AI usage in education involves teaching pupils how to acknowledge and mitigate ethical threats, especially in higher education, due to the age of students and the level of awareness they have [22]. The integration of AI technologies into educational assessment is a necessity due to the positive impact on enhancing pupils' confidence, bridging gaps in accessibility and usage, and academic competencies [23]. Among all the proposed AI literacy frameworks, none of them have empirically aligned with the higher education system's expectations. Many scholars emphasized the importance of understanding the full potential of these revolutionary technologies in education, which requires a holistic and multidisciplinary framework that will be able to inform academic practices, research, and policy [24]. Into the bargain, there is a significant shortage of studies that focus on the influence of ethical usage of AI in designing and enhancing assessment techniques and tools, and how it will result in fostering equity and equality in pupils' learning experiences [25]. This gap magnifies the need for extensive empirical studies that test the efficacy of AI literacy frameworks and look deeply into the ethical and practical implications of AI usage in academic evaluations. Recognizing these dynamics helps foster the enhancement of AI-targeted interventions to ensure that pupils are fully equipped with knowledge and skills to use AI tools and technologies transparently and responsibly for their educational pursuits. The role of AI in education is very promising, besides its ability to solve many global challenges; however, concerns about societal

equity continue to grow [26]. Some scholars emphasize the importance of avoiding a broader ethical debate by promoting a global equal distribution of AI technologies, viewing these technologies as a source of the common good for everyone rather than as a business resource. According to the latest researchers, AI resources should be treated as an owned entity rather than a shared one. This highlights the ethical boundaries of using AI resources within different educational and cultural contexts [21].

As per Nguyen (2022), asserting contextualized ethics standards in an AI literacy framework is a necessity before implementing AI tools in any educational setting to enhance the generic coding, incorporate full elements of AI tools, and foster the societal-technical equity, scholar explained how might the AI application can vary between different types of educational and cultural settings, also he proposed that applying the UNESCO's international standards which were made available through the European Union will help to overcome cultural differences and create a universal unity that aims to foster the academic achievements of learners through the responsible use of artificial intelligence resources[20].

4.2.3 Transparency

Another concern with deploying AI in education is transparency. According to Larsson et al. (2020), the articulation of the data collection, using, and owning processes while implementing AI in an educational setting should be based on trust among educators and pupils. Additionally, he revealed that there is still an unsolved obstacle to learners' data ownership, where AI tools generate the data, but still higher institutions acquire it; hence, institutions must adopt open frameworks and policies that define these ethical boundaries [26]. Parsons (2020) discussed in her articles how internally collected data by educators and technologies goes ungoverned, and how higher educational institutions should monitor the internal process of generating pupils' data and openly deploy the AI technologies used in their systems to avoid the possibilities of misusing this data and creating ethical boundaries [19]. Studies, such as Bird et al. (2022), concentrated on the "Black Boxes." Which is another label for the AI deep learning tools due to their ability to produce opaque and incomprehensible decisions, which cause real-world serious repercussions, such as legal prejudgments and educational assessments. Avoiding these obstacles, universities, for example, must guarantee the transparency of those AI deep-learning systems before allowing them to be used by their learners (Bird, 2022). As per the IEEE (2019) report, transparency should be highlighted as a main goal for all AI autonomous educational systems due to its ability to mitigate the societal ramifications. The report emphasized the importance of establishing new frameworks that allow the testing of transparency and monitor continuous measurement to govern and guarantee the overall ethical management of AI tools and enhance public trust [27].

6. Conclusion

This paper reviewed various definitions of AI literacy and the ethical implications of AI deployment in higher education in the UAE. Most literature looked at AI literacy based on the associated skill sets and knowledge. This review encapsulates a diverse sequence of anticipations and concerns. Since the deployment of AI in education is an emerging field, there is a shortage of studies that discuss AI literacy frameworks in an educational context, especially in higher education. Literature reflects a critical debate between full transformation toward the integration of AI in educational contexts and, on the other hand, the AI tendency to create serious ethical dilemmas, which is a significant threat to pupils' data, biases, and transparency. Notably, the literature discussed the vision of a regional approach to create unified ethical guidelines for the usage of AI in education. Additionally, a visible gap appears in the number of empirical studies that highlight the ethical dimensions of the massive, expected shift toward the use of AI in education; this particular gap is crystal clear in the context of the understanding of the "Unified Theory of Acceptance and Use of Technology (UTAUT)", Those, where the current review

placing itself, attempting to review the potentials and bridging the gaps through thematically reviewing the nuanced anticipations of the deployment of AI resources in education and the associated ethical potentials. Based on the current endeavour, this paper aspires to participate in the discourse of enhancing a better understanding of the pivotal need to create an AI literacy framework that provides clear guidance for educators and helps them navigate the evolving era.

6.1 Findings and future recommendations

This review's findings contribute a preliminary overview of the optimistic role that AI resources are going to play in the UAE's higher education field, as well as a deeper look at the current empirical literature of AI literacy to enhance the substantial understanding of the ethical potentials that AI is bringing to the table. As AI tools continue to emerge in educational practices, addressing the associated ethical obstacles identified by this paper is crucial. Higher education institutions must prioritise implementing ethical frameworks that guide and protect pupils and educators, ensure data privacy and ownership, and mitigate any potential biases. Additionally, this paper recommends an ongoing investigation of the long-term impacts of AI resources on equity and equality in higher education. This review emphasized the anticipated positive influence of AI technologies in higher education. However, it addressed the massive ethical considerations that require ongoing consultation to guarantee an appropriate ethical deployment of AI in the UAE's higher education institutions. Furthermore, this review addresses a vital prerequisite that will ensure a successful deployment of AI in the UAE's higher education, such as the readiness of the higher education institutions and investment opportunities to enhance the technological infrastructure of these institutions. Moreover, this paper recommends increasing the number of methodological studies that incorporate qualitative methodologies to embrace the diverse insights, investigate the different contextual factors, and illuminate pupils' experiences with AI resources to uncover the subjectivity and interpretations of these resources. It is foreseen that there will be a massive increase in the empirical literature that analyses the influence of AI resources in an educational context and examines the quality of various AI literacy evaluations. Ultimately, such a shift will enable all parties to harness the maximum potential of AI tools while preserving and enhancing the privacy, integrity, and fairness of the Emirati higher educational field.

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