New Trends in Studies of AI Literacy in Education, Marketing, and Media Fields in the Recent Decade (2014-2024): A Secondary Analysis Study

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Abstract

As technology continues to advance at an accelerated pace, the understanding of Artificial Intelligence (AI) is no longer merely a beneficial asset; it is a critical necessity. This paper offers a thorough examination of the present state of AI-literacy research in education, marketing, and media sectors, with a specific emphasis on the variety of studies in terms of language, timeframe, and type of subject matter. The study applied the secondary-analysis approach of 60 English-language studies and 3 Arabic-language studies published between 2014 to 2024; these studies highlight significant topics like AI literacy and AI technologies across various educational, marketing, and media settings. Findings of this paper recommend that it's crucial for educators, marketing leaders, and media professionals to remain knowledgeable and to adapt to the developments raised by new AI technologies. The objective of this study is to offer suggestions for effectively integrating AI literacy and AI technologies into their practices.

Keywords:Artificial Intelligence; AI Literacy; AI-technologies; AI in Education; Educational Technology; AI in Marketing; Digital Marketing and AI; AI in media; New Media and AI

ملخص:

فى ظل استمرارية التقدم التكنولوجي بوتيرة متسارعة، أصبح فهم الذكاء الاصطناعي (AI) ليس مجرد اداة مفيدة فحسب، بل ضرورة حتمية. يقدم هذا البحث دراسة شاملة لحالة الأبحاث الحالية حول الإلمام بالذكاء الاصطناعي في مجالات التعليم والتسويق والإعلام، مع التركيز بشكل خاص على تنوع الدراسات من حيث اللغة والإطار الزمني ونوع الموضوعات. اعتمدت الدراسة على منهج التحليل الثانوي على ٦٠ دراسة باللغة الإنجليزية و٣ دراسات باللغة العربية تم نشرها في الفترة بين عامي والتقنيات المرتبطة به في مجالات التعليم والتسويق والإعلام مع التركيز بشكل خاص على تنوع والثانوي على ٦٠ دراسة باللغة الإنجليزية و٣ دراسات باللغة العربية تم نشرها في الفترة بين عامي والتقنيات المرتبطة به في مجالات التعليم والتسويق والإعلام المختلفة. توصي نتائج هذه الورقة بضرورة بقاء التربويين وقادة التسويق والعاملين بمهنة الإعلام على الملاع دائم والتكيف مع التطورات التي تفرضها تقنيات الذكاء الاصطناعي الجديدة. يهدف هذا البحث إلى تقديم توصيات لتطبيق فعّال للإلمام بالذكاء الاصطناعي والتقنيات المرتبطة به في الفترة بين عامي

الكلمات المفتاحية: الذكاء الاصطناعي؛ الإلمام بالذكاء الاصطناعي؛ تقنيات الذكاء الاصطناعي؛ الذكاء الاصطناعي في التعليم؛ التكنولوجيا التعليمية؛ الذكاء الاصطناعي في التسويق؛ التسويق الرقمي والذكاء الاصطناعي؛ الذكاء الاصطناعي في الإعلام؛ الإعلام الجديد والذكاء الاصطناعي.

Introducation

Nowadays. Artificial Intelligence (AI) is widely developing and revolutionising several sectors, retransforming the methods individuals connect with technology in the fields of education, marketing, and media environments. The idea of AI is grounded in the definition-of acquiring computers to do a number of duties that involve average individuals' intelligence (Van Duin & Bakhshi, 2018). AI is a combination of several algorithms and technologies that can address vision, problem-solving, learning, logical thinking, and/or language-comprehension. In fact, in this modern world, AI can be adopted in a huge number of ways, ranging from automated self-driving vehicles to personal intelligent assistants (Saleh, 2019; Oing et al., 2024).

The literacy of artificial intelligence AI literacy, as research defined it, requires cognitive and practical skills to utilize, adopt, and evaluate digital AI-technologies. Such AI-literacy is needed to engage people with robust advancements in many sectors. Due to this robust development, AI uses education, marketing, and media, which underscores the demand for better AI literacy to ensure that these AI-driven technologies are applied innovatively and responsibly (Acar, 2024).

AI literacy in the educational environment is essential for educators and students to integrate into the teaching and learning process. In fact, adaptive learning systems are one of the AI-technologies that can improve educational outcomes by filling the appropriate individual's learning style. On the other side, integrating AI-technologies into the educational background can offer multipule ethical challenges, including AI decision-making and data privacy concerns (Almohammadi et al., 2017; Ahmad and Wan Abdul Ghapar, 2019). Furthermore, AI-technologies have revolutionised the marketing sector, as these technologies have allowed several companies to provide more engaging, efficient, and personalised customer experiences. The current AI-technologies like chatbots, predictive analytics tools, and automated content creation became an ordinary daily thing; however, these technologies demand the proficiency of the marketers in AI-literacy to comprehend the data appropriately and adopt ethical marketing strategies. In this regard, marketers must utilize the limitations and capabilities of AI to balance responsibility with technological innovation (Haleem et al., 2022; Acar, 2024).

In line with this transformation, AI-driven technologies have significantly changed the media industry, applying new technologies and algorithms to enhance audience engagement, collect media content, and even produce media and news stories. Consequently, AI-literacy in the media industry is very essential for media practitioners and professionals to comprehend the impact of AI-technologies on content generation and dissemination. That combines media ethical concerns about misinformation, bias, and a possible breakdown of journalistic integrity caused by algorithmic content gathering. Accordingly, media practitioners and professionals must be knowledgeable in AI-literacy to guarantee their ethical integrity while employing AI-technologies (Gavurova et al., 2024; Khan, 2023).

Eventually, AI literacy is more than specialising in certain skills limited to technological experts; it has turned into a mandatory requirement for all individuals across multiple fields, including the educational, marketing, and media fields. Since AI-technologies develop and become increasingly integrated into people's daily lives, advancing AI literacy will enable people to effectively address the opportunities and challenges posed by AI-technologies, resulting in more innovative, ethical, and informed practices within these fields. Meanwhile, collaboration initiatives across educational institutions, marketing leaders, and media entities are necessary to establish AI literacy programs that cover both ethical and practical issues.

Methodology

Problem statement of the research

The Artificial Intelligence is widely spearheading, which makes most of the science literature focus on AI-related features and technologies such as "Machine Learning (ML)", "Computer Vision (CV)", and "Natural Language Processing (NLP). These technologies are required to understand the potential applications and implications of AI in different sectors. By enhancing AI literacy, organizations can better leverage these technologies to drive innovation and growth.

The study problem statement is on comprehending Artificial Intelligence literacy across several domains, including education, marketing, and media, using a secondary-analysis of article reviews. The research seeks to evaluate the present state of AI literacy across several businesses and pinpoint any existing gaps or trends. Researchers aim to get a thorough grasp of the perception and utilisation of AI across many industries by doing a secondaryanalysis of publications from diverse domains. This study will provide significant insights on the general understanding and awareness of artificial intelligence across many businesses.

The research aims to identify frequent concepts and issues associated with AIliteracy by the analysis of data and conclusions from multiple sources. The objective is to provide ideas for enhancing AI literacy across diverse professionals and facilitating enhanced integration of AI technology in many aspects.

Research Objectives

• Analyse the AI-literacy studies development patterns of research studies from the years (2014 to 2024): to identify trends, emerging concepts, and areas of interest in AI-literacy research throughout the period under discussion.

• Identifying the theoretical frameworks and methodologies: through analysing the studies' theoretical frameworks on AI-literacy studies as well as research's methodological approaches in reviewed literature that are meant for establishing their advantages, limitations, and possible challenges.

• Main concepts and perspectives identification: Identify the main concepts and perspectives in the forefront of the research conducted in the field of both AI-literacy and AI-technologies, including the approaches within the fields of education, marketing, and media.

• Evaluate the present state of AI-literacy studies: determine how well organisations and people presently understand, know, and can work with AI technologies.

• Identify gaps and challenges in AI-literacy studies: Point out deficiencies in existing technology education programs and curricula, as well as barriers to AI literacy development.

• Analyse key findings and recommendations: Summarise the main results and insights from the reviewed studies and propose recommendations for improving AI literacy in the future research.

Research Questions

RQ1: What are the major trends and perspectives examined in AI-literacy studies?

RQ2: What are the dominant theoretical frameworks used in AI-literacy studies?

RQ3: What are the main methodologies applied in AI-literacy studies?

RQ4: What are the main findings and results from the reviewed studies on AIliteracy studies?

RQ5: How has AI-literacy studies and development evolved from 2014-2024? **1. Research Methodology**

The study employs a (Meta-analysis) research as a secondary level of research, aiming to provide a comprehensive understanding of AI literacy in different perspectives such as education, marketing, and media. In order to synthesise information from previous studies, this paper is adopting the quantitative style method using the secondary-analysis review of studies as its main methodological tool (da Costa & Hall, 2016).

This study provides an extensive review and assessment of the main AIliteracy perspectives, theoretical frameworks, and methodological approaches as well as the full provided findings and results generated from reviewed research. Moreover, a secondary-analysis methodological approach can be adopted to identify various research gaps, opportunities, and challenges in AI literacy within the education, marketing, and media fields. This approach not only demonstrates existing and previous knowledge but also recommends' ideas for future initiatives.

The study focused on reviewing the literature (Full-Text) from 63 different sources that examine AI literacy in among the perspectives of education, marketing, and media fields all over the world, including Egypt, particularly those published in the recent ten years from 2014 to 2024 to capture recent trends and technologies.

Publication Year	Number of Studies
2024	13
2023	13
2022	8
2021	5
2020	3
2019	6
2018	3
2017	2
2016	6
2015	1
2014	3
Total	63

Table 1: Distribution of AI-literacy Studies by publication year

This study adopted certain inclusion criteria, such as specific years of publications, certain keywords, particular categorisation of studies, selected perspective types, and lastly, preferred search repositories for collecting the reviewed studies. The above-mentioned table 1, shows the distribution of studies by publication year. While the below Table 2 presents a summary of studies primarily focusing on the chosen perspectives of AI literacy and its effects on various sectors such as education, marketing, and media with a total of 36 studies for AI literacy in Education, 11 studies for AI literacy in Marketing, and 16 studies AI literacy in Media.

Table 2. The humber of AI-meracy studies and respective		
Perspective study type	Number of Studies	
AI literacy in Education	36	
AI literacy in Marketing	11	
AI literacy in Media	16	
Total	63	

 Table 2: The number of AI-literacy Studies and Perspective

The research includes certain categories of studies, such as academic journal articles gathered from various journals, conference paper, and dissertations, but excludes any books or other documents. The below-mentioned table 3 shows the number of studies per category and type with a total number of 56 academic journals, 3 conference papers, and 4 dissertations.

Table 3: The number of AI-literacy Studies categories and types

Category of the study				
Perspective study type	Academic Journals	Conference papers	Dissertations	
AI literacy in Education	31	2	3	
AI literacy in Marketing	11	0	0	
AI literacy in Media	14	1	1	
Total	56	3	4	

Moreover, the inclusion criteria in this study include specific keywords gathered from a previous literature to pinpoint particular perspectives and key terms. According to the under-mentioned in Table 4, this paper has used over ten keywords, such as "Artificial Intelligence; AI literacy; AI in Education; AI in Media, AI in Marketing" to reach certain perspectives related to the objectives of the research.

Table 4: Used keywords for searching AI-literacy Studies

Used Keywords	Used Perspectives and Topics
• AI literacy	Artificial Intelligence as defention and general information about
Artificial Intelligence	AI literacy and its technologies.
• AI-technologies	
• AI	AI literacy in Education and technologies applied in the
• AI in Education	educational sector.
Educational Technology	
• AI	AI literacy in marketing and technologies applied in the marketing
AI in Marketing	sector.
 Digital Marketing and AI 	
• AI	AI literacy in media and technologies applied in the media
• AI in media	industry.
 New Media and AI 	

The reviewed studies in the provided reference list part are primarily divided into English and Arabic studies related to the research's main concept. These studies are classified as follows: • **60 studies in the English language**, covering various topics related to artificial intelligence literacy or as it abbravited "AI literacy", and its implications and impact on various fields such as education, marketing, and media sectors. These studies include journal articles, conference papers, and dissertations.

• **3studies in the Arabic language**, which focus on AI literacy in journalism, the role of information literacy in promoting digital citizenship, and the impact of AI on the labor market.

Lastly, this paper went through 5 main credible search repositories for collecting and reviewing the academic literature using the abovementioned keywords, and the websites are represented as follows (Google Scholar, Science Direct, Egyptian Knowledge Bank (EKB), Academia, and Research Gate).

Conversely, as a part of the exclusion criteria of this research, some elimination procedures were related to the studies that didn't directly address AI literacy or were outdated; certain methods of collecting data were excluded, thereby filtering for quality and relevancy. Similarly, the paper eliminated any data collected prior to 2014 to ensure it remains current.

These selected sampling and filtering criteria were applied to ensure the reachness of the objectives set by the author of this secondary-analysis paper. This will result in three main beneficial aspects, which are (1) Relevance – to limit the sample of the study to a certain time frame to AI-related topics that secure its relevant and up-to-date information; and (2) Focus – to focus on selected AI-related topics that specifically address the already mentioned perspectives of education, marketing, and media. (3) Quality – to establish a particular quality level of analysis and directly support the research main objectives.

The perspectives and concepts of AI literacy

RQ1: What are the major trends and perspectives examined in AI-literacy studies?

B. AI-literacy studies in education

Most of the reviewd studies agreed that Artificial intelligence (AI) literacy has provided educators with new digital skills required for efficient communication, evaluation, collaboration, as well as ethical use of AI in almost everyplace, like home, workplace, and online settings (Ng et al., 2023; Thornhill-Miller et al., 2023; Markauskaite et al., 2022).

Nowadays, AI is widely used in educational contexts; more prominently in the case of e-learning, Potode & Manjare (2015) point out that such technology has markedly improved interaction, cooperation, sharing of resources, engaging students and teaching them as well as conveying instruction at a distance over the past twenty years. As distance education has gained more adherents, the need for flexible, smart pedagogical help has only increased. Ng et al. (2021), examines the concept of AI literacy, highlighting the need of public comprehension of AI technologies and their practical uses. Its objective is to provide a theoretical basis for identifying, instructing, assessing, and resolving ethical issues related to AI.

The use of technologies in question aims to understand what teachers and learners want from each other to improve their grasp and appreciation of that specific context. The papers indicated that the aim of intelligent tutoring systems is to adapt the teaching skills based on the multi-dimensional structures of knowledge system which encompass domains, pedagogical information, interactive processes, and users' profiles (Beheshti & Pakfar, 2014; Mohammed Mahmoud Ghoneim & Elsayed Abdelsalam Elghotmy, 2021).

Also, Karal et al. (2014), aimed at the education process related understanding of the AI domain by examining the performance of a novel distance learning system named ARTIMAT. This is a system that focuses on more practical means of helping learners acquire what is necessary for tackling mathematical problems. In a similar manner, Nye (2014) examined the application and the advancement of artificial intelligence on the network intuitive tutoring system, whereby access is gained through the internet for educational advances.

A side of the educational system, some studies like Tarek Noour (2024), Moses (2024), Mousa (2024), Ali (2023), Sharawy (2023), and AlSamhori et al. (2023) discussed the utilization of AI in education in countries like Egypt, Nigeria, Jordan, and China; and how it improves learning techniques, students, teaching, and overall educational equity and accessibility. Besides, most of these articles agreed that nations all over the world are rapidly developing AI into educational curriculums to improve educators' skills for their future careers and studies.



One study done by Sætra (2021), highlighted the importance of AI in Sustainable Development Goals (SDGs) and showed the associted impact on education by providing remote AI teaching that can improve inclusivity and equitable quality learning.

C. AI-literacy studies in marketing

AI is widely recognized as a highly potent instrument for facilitating significant changes in the utilization of marketing tools, leveraging diverse information produced inside the worldwide network. It has the potential to influence marketing strategies from a multi-level global perspective, considering the customer, company, and nation, with an emphasis on economic disparity, cultural compatibility, and ethical factors (Ponomarenko et al., 2024; Kopalle et al., 2022; Davenport et al., 2020).

The studies conducted by Labib (2024), Bulchand-Gidumal et al. (2024), Haleem et al. (2022), explored several usages of AI in the marketing context; such as predictive analytics, personalized content delivery, and customer segmentation. These papers described the "Deep Learning (DL), Natural Language Processing (NLP), and Machine Learning (ML)" are examples of AI technologies that are revolutionizing marketing strategies by offering more effective, focused, and data-driven methods. All of these technologies changed the way businesses operate, speed-up growth, and revolutionized marketing strategies.

In addition to the AI Mechanism to marketing, it was mentioned by Acar (2024) and Soni (2023) that the application of "Generative AI," or "GenAI," could bring about a revolution in marketing education. The authors highlighted the benefits of GenAI that could result in personalization, fostering creativity, scalability, and cost efficiency.

In other words, people nowadays are familiar with GenAI in marketing presented in AI Chatbots and AI image/video generators, which can be used to provide data and info at astonishing speed, and that is the great power of AI when it comes to marketers (Deveau et al., 2023; Miikkulainen, 2021).

D. AI-literacy studies in media

Most of the reviewed studies like Henry (2019), Pinto et al. (2024), (عبدالرازق 4 , 4 , 7), and Aissani et al. (2023) agreed on the power of AI in processing media data and generate content. Saleh (2023), stated that AI is taking a huge step not only into human's lifes and but also in the media industry as big agences and organizations such as "Washington Post", "AP", and "New York Times" are using AI to increase the research speed, refine data, automate stories and news, apply image recognition in their data, and accumulate real-time transcripts.

In the study done by Khan (2023), his research concluded that AI technologies has transformed the way content considered and created within the media context; as AI is able to produce numerous amount of data effectively and rapdly. This affects creative writings, news reporting, and creating videos; besides it can offer the latest technologies in improving image editing, audio augmentation, and video producation for providing users with relevant data and personalized materials that also boost users' overall engagement and satisfaction.

Likewise, Tiernan et al. (2023) mentioned that in order to reach users engagement through AI in media large media platforms such as Spotify and Netflix apply users' trends and historical information to suggest certain entertaining content to their consumers. In fact, this paper declared that AI has widespread impact over social media apps and platforms.

Moreover, Sørensen & Hutchinson (2018) described the way public service media associations in Australian and European countries are using AI algorithms to improve some digital services, such as content suggestion, which is vital to apply the move of personalization and big data for mediarelated topics.

On the other hand, Trattner et al. (2021) and Gavurova et al. (2024) in their papers illustrates the issues and challenges posed by AI and digital technologies in the media industry, particularly in maintaining public trust. These challenges include the shift in media consumption towards the internet and the proliferation of false information and data. In parallel, Robinson (2020), identied a number of challenges utilizing AI technologies within media settings; these challenges contains code of ethics like AI language algorithms'

fairness and bias, data security and privacy, as well as the notion of transparency of AI.

The theories and models examined in the evaluated studies

RQ2: What are the dominant theoretical frameworks used in AI-literacy studies?

The reviewed studies concluded that the main theories and models utilized were focusing on the integration of AI in education, media, marketing, and other interdisciplinary areas. Moreover, the reviewed studies applied different theoritical frameworks according to the topic; however, most of them focus were applied as follows (Technology Adoption and Integration Theories in relation to Educational and marketing context; Behavioral Theories; Diffusion of Innovations Theory; and lastly Theories of Media Influence)

For instance, in the Technology Adoption and Integration Theories; Ali (2023) utilizes a combination of technology acceptance models (TAM) and AI conceptual framework to evaluate the readiness levels of Egyptian higher education universities to adopt AI in their educational systems and called it "AIED - Artificial Intelligence in Education" as mention in the figure below. Besides, Beheshti and Pakfar (2014) applied an intelligent educational technology model to assess the effectiveness of AI tools in enhancing learning outcomes in computer network courses. Gyasi et al. (2019) utilized the technological innovation theory to understand how AI technologies can revolutionize individuals in some fields by enhancing education, quality, efficiency, and safety.



Source: Constructed by the researcher

As for the educational based models and theories, Alzahrani (2022) emphasised AI technologies by focussing on their integration and application to improve the educational environment by highlighting the framework of adaptive learning and educational echnology. This framework is grounded in individualising the learning settings based on the observer's preferences, behaviours, and needs. Following the same pattern (Ng et al., 2023), created their model as mentioned below to assess learning outcomes using the four main education pliers, which include affective, behavioral, cognitive, and ethical learning.



Bizami et al. (2023) in their paper discussed the application of AI in the fascinating blended learning settings, designing technological pedagogical framework based on "Technology-Enhanced Learning - (TEL)" and "Constructivism" theories. Equally, Karal et al. (2014) used constructivism learning theory to understand the students' experiences in using educational systems, especially the one they developed to engage the students abilities in their education.

The authors How & Hung (2019) and Burgsteiner et al. (2016) used in their papers a theory called STEAM—Science, Technology, Engineering, Arts, and Mathematics Education, which is an AI-assisted educational system designed to explore and understand all the dimensions of AI-technologies in relation to education. Moreover, the authors Markauskaite et al. (2022) and Kandlhofer et al. (2016) applied theoretical frameworks focused on the abilities and skills that people need to use in an AI- integrated ecosystem, providing educational

models that underline critical thinking, AI literacy, and adjustable problemsolving proficiencies. Kandlhofer et al. (2016) went to the same path by constructing the educational theories to build a syllabus that integrates AItechnologies from the preschool to the university stages.

As for the marketing and AI-related theoretical frameworks; most of the articles like Haleem et al. (2022), Labib (2024), Miikkulainen (2021), and Davenport et al. (2020) built frameworks grounded on theories and models like AI-literacy models, constructivism theories, and diffusion of innovation theories. Soni (2023), for example, integrated concepts such as complexity, compatibility, and trialability from the Diffusion of Innovations theory to evaluate the rate of adoption of AI-technologies such as generative AI among marketing institutions.

Taecharungroj and Karnchanapoo (2023) designed a multidimensional framework named "Six E's Model of AI Literacy". This framework is intended to promote an extensive understanding of AI-technologies over several societal aspects, underscoring not only the functional and technological domains of AI literacy but also its wider ethical and societal implications. As below-mentioned, the model consists of six main elements: "Essentials, Engineering, Enabling, Evaluation, Effects, and Ethics".



In the same path, Deveau et al. (2023) and Ponomarenko et al. (2024) presented a framework that combines factors of strategic marketing and management, data science, and technology adoption theories, as this framework utilises the revolutionising role of generative AI or GenAI in sales and marketing by emphasising the way AI-technologies improve productivity, customer engagement, and efficiency, throughout the AI data-driven and automation insights. In fact, Ponomarenko et al. (2024) built a framework with a focus on the connection between machine learning (ML) algorithms and big data to explore the developmental consequences of AI in marketing.

Likewise, Acar (2024) adopted a structured model to understand GenAI in marketing by utilizing three main dimensions –1. "Cost Efficiency and Scalability" which represent the GenAI's cabibility to minimize cost and maximize scalability; 2. "Personalization and Accessibility" represent the GenAI's cabibility to be cusomizemble and personalized based on needs as well as the ability to improve effectiveness and accessibility; 3. "Creativity and Inovation" represent the GenAI's cabibility to improve creativity and promote innovation.

On the other side, Kopalle et al. (2022) utilised a new marketing framework to explore the impact of AI-technologies among three dimensions: consumer, company, and country. These 3-level frameworks offer an inclusive understanding of the way AI-technologies are expanded globally in the marketing industry, involving consumer, corporate, and economic perspectives.

As for the media and AI-related theoretical frameworks; most of the articles such as Saleh (2023), Henry (2019), Khan (2023), Gavurova et al. (2024), $({}^{*},{}^{*})$, Gouda (2022), and Trattner et al. (2021) built frameworks grounded on theories and frameworks related to AI-technologies in journalism and media, testing dimenisons like AI-literacy, ethical implication, AI Readiness and AI Adoption Models.

The study of Saleh (2023) utilized an extensive theoretical framework point on the ethical implications of AI-technologies in media in general and journalism in specific. Notably, this framework is grounded on a comprehensive review of the AI-ethics studies, which was structured to discover both the AI-ethical challenges and opportunities that AI-technologies offer. Equally, Sørensen & Hutchinson (2018) and Pinto et al. (2024) in their papers used a framework that investigates the AI-ethical implications that could occur specially in media. The authors highlited the main ethical elements such as accountability, fairness , and transparency to test the decision-making and practices using AI-technologies. The reviewed paper of Elaasser et al. (2024) suggested the AI readiness and AI adoption framework to assess and explore the adoption and combination of AI-technologies in institutions, particularly those who are Egyptian newsrooms. This framework illustrates as mentioned-below three steps of AI-adoption, which are "initiation," "adoption decision," and "implementation." As for the AI-readiness, the model focusses on five aspects that could influence AI-adoption and they are "Knowledge", "Resources", "Strategic Alignment", "Data", and "Culture".



On the other side, Tiernan et al. (2023) have implemented a multi-phased model that examines the necessity of acquiring new skills through technology in the media workplace; this model integrates theories from the fields of technology adoption, educational psychology, and technology adoption.

Robinson (2020) and Sharawy (2023) adoped in their papers a cross-cultural frameworks to assess the effectiveness as well as the adoption of AI-technologies in different regional settings. The adopted theories underscore the need for customized AI-driven tools adaptable to diverse cultural contexts. The study of Robinson (2020) used Hofstede's Cultural model to compare and analyse the cultural values grounded in the international AI-technologies and strategies, as these dimensions assist in utilising the cultural elements such as openness, influence, trust, and transparency in relation to AI-technologies.

The methods examined in the research being evaluated

RQ3: What are the main methodologies applied in AI-literacy studies?

The reviewed papers showed different applications of the methodolocigal approaches from qualitaitve to quantitative techniques depending on the topic and the used theoretical model or framework. Starting with studies related to AI literacy in education, most of the following papers Alzahrani (2022), Almohammadi et al. (2017), Sætra (2021), Ng et al., (2021), Ng et al. (2023), Wang et al. (2024), Chassignol et al. (2018), Sywelem & Mahklouf (2024), Marwan (2020), Luckin & Holmes (2016), Nye (2014), and Gyasi et al. (2019) adopted the literature review approach to utilize the AI in the educational backgroud. As an example, Wang et al. (2024) and Chassignol et al. (2018) reviewed the literature to explore the key themes and trends of AI in educational settings.

The methodological approach of practical applications were done by Kandlhofer et al. (2016), Thornhill-Miller et al. (2023), Vazhayil et al. (2019), Burgsteiner et al. (2016), Goel & Joyner (2017), Markauskaite et al. (2022), and Beheshti & Pakfar (2014) to employ and evaluate the AI technologies in education. For instance, Burgsteiner et al. (2016) created a practical course divided into seven sessions a week to offer to high school students, and it is designed to cover main topics related to AI such as planning, searching, problem solving, graphs, machine learning, and automation systems within the educational context.

The third methodological approach in educational-related articles was the mixed-methods approach, some of the reveiwed literature Ali (2023), Luckin & Cukurova (2019), How & Hung (2019), Karal et al. (2014), and Ahmad & Wan Abdul Ghapar (2019) prefered this type of approach in their papers to clearfy the use of AI in education. Ali (2023) focused on the adoption of AI in the higher education and its challenges by using the mixed-methods approach by conducting in-depth interviews with 46 university staff members from ten distinctive universities as a primary data and reviewing the literature as a secondary data collected to this research.

Furthermore, Moses (2024), Sangapu (2018), Mousa (2024), Tarek Noour (2024), and AlSamhori et al. (2023) adopted the questionnaire design approach to explore the users' perceptions of using AI in the educational process. Sharma et al. (2016) and Roll & Wylie (2016) employed the content analysis method as their primary means of gathering data to evaluate and assess the integration of education and technology.

Lastly, one revised paper done by Sharawy (2023), utilised the one-on-one interviews with fifteen selected participants to analyse the perspectives from

five diverse universities in Egypt. On the other side, a revised study by Mohammed Mahmoud Ghoneim and Elsayed Abdelsalam Elghotmy (2021) has done the quasi-experimental design to study the use of AI-based programs for educational systems and compare it to other groups that received traditional educational systems.

The methodological approaches used among the AI literacy in marketingrelated studies were mostly using the literature review approach, as papers like Taecharungroj and Karnchanapoo (2023), Haleem et al. (2022) Labib (2024), Kopalle et al. (2022), and Davenport et al. (2020) perefered to use this approach to explore and understand the use, effects, and challenges of AI in the marketing field. For instance, Kopalle et al. (2022) focused on exploring AI technologies used over the marketing field from three different perspectives' levels: customer, company, and country.

The mixed method approach was the second methodological approach used between the researchers in the marketing context; Studies like Ponomarenko et al. (2024), Bulchand-Gidumal et al. (2024), and Acar (2024) used different mixed methods to ensure that they understood the use of AI in marketing settings. As a matter of fact, Bulchand-Gidumal et al. (2024) used three interlinked phases to investigate the impact of AI technologies on marketing elements of hotels. This study conducted a series of focus groups, in-depth interviews, and distributed a questionnaire).

Deveau et al. (2023) and Miikkulainen (2021) used the practical implementation method to explore the challenges and outcomes associated with AI-powered content marketing and sales with generative AI functions.

One study done by Soni (2023), used the survey as its main methodological approach to understand the aspects shaping the adoption of generative AI technologies over the current digital marketing campaigns. This paper distributed a questionnaire among 411 marketing professionals among three main roles: Social Media Managers, Digital Marketing Managers, and Content Managers or Strategists.

As for the AI literacy in media related studies, most of the researchers like $({}^{\tau} \cdot {}^{\tau} \cdot {}^{\tau})$ السيد, Saleh (2023), Tiernan et al. (2023), Khan (2023), Sančanin & Penjisevic (2022), $({}^{\tau} \cdot {}^{\tau} \cdot {}^{\tau})$ طايل, Trattner et al. (2021), Henry (2019), Aissani et al. (2023), and Sørensen & Hutchinson (2018) chose to apply the methodological approach of reviewing the relevant literature. For example, Saleh (2023) focused on reviewing the literature from 2016 to 2023 by studying data from case studies, academic journals, and industry reports to

understand the AI technologies and the ethical challenges provided in journalism and media.

Online survey was the second methodological approach used between the researchers; particarlly by Gouda (2022), who tried to exploring the effects of AI technology in the field and the learning abilities as well as the changes and skills required for the future by distribute an online survey.

Nevertheless, Elaasser et al. (2024), conducted in-depth interviews covering the perspectives of AI awareness in newsrooms by searching AI adoption and integration among media specialists and journalists.

Finally, Pinto et al. (2024) and (۲۰۲۲) عبدالرازق used a mixed two-step approach by selection and implementation of certain working corpus and conducting a content analysis to understand AI media and information literacy offered in the academic libraries. While عبدالرازق (۲۰۲۲) used to understand AI in media by a mixed two-step approach using questionaries and interviews with media representatives.

The main results and key findings of the reviewed studies

RQ4: What are the main findings and results from the reviewed studies on AIliteracy studies?

Most of the reviewed studies have pointed out the great power and potential of AI in revolutionising the overall educational experience and improving the users' engagement; research has mentioned that AI technologies can tailor challenges and customise the system based on users' needs, guiding to enhanced outcomes, engagement, and motivation. The research reviewed studies of Ng et al. (2021),Alzahrani (2022), Kandlhofer et al. (2016), Thornhill-Miller et al. (2023), Sangapu (2018), Chassignol et al. (2018), Ali (2023), AlSamhori et al. (2023), Karal et al. (2014), Roll & Wylie (2016), and Luckin & Cukurova (2019) agreed that AI-driven powerful tools can be used to reconstruct the educational environment over students and teachers. For instance, the studies done by Ng et al. (2023) and Moses (2024) pointed to the significant relevance of AI literacy for both learners and educators, as it includes the capability to understand, practice, and create with AI technologies.

Ahmad and Wan Abdul Ghapar (2019) have discovered that tangible systems of mixed-reality educational systems can improve self-exploration learning and bring personalised educational experiences for teachers and students. Additionally, Bizami et al. (2023) and Sangapu (2018) exemplified that immersive blended education, which offers traditional face-to-face learning settings with online learning experiences, can improve students' motivations, learning outcomes, and engagements. Moreover, Wang et al. (2024) have stated that there is a significant positive impact of AI-technologies on learning outcomes, including 30% improvement in the overall learner performance and 62% enhancement in the assessment grades. The study also highlighted the strong engagement of instructors and students using AI-technologies in the educational context.

The studies of Almohammadi et al. (2017), Beheshti & Pakfar (2014), and Potode & Manjare (2015) have emphasised the role of AI-tools in assessing, analysing, and evaluating the skills and knowledge of the instructors and students in an e-learning environment system. These learning systems can provide personalised educational experiences by managing content reachness based on the instructors' and students' performance. Additionally, the use of AI-tools in e-learning can enhance the users' optimisation, decision-making, and instruction of the educational operation, making it more efficient and robust. Furthermore, Goel & Joyner (2017), have determined that, notably, 7 out of 14 online students' results presented higher statistically significant performance compared to offline assessments. And above 75% of the observers admit that the AI-tools-offering exercises have improved their overall understanding of AI-technologies and AI-concepts.

While AI-technologies provide several benefits, it is vital to count the ethical implications of their employment within the educational systems. Concerns consist of bias, privacy, and the possibility for AI-technologies to substitute human interaction. The papers of Ng et al. (2021), Sharawy (2023), and Sywelem & Mahklouf (2024) emphasised the significance of ethical dilemmas of critical thinking and reasoning in AI literacy. It is essential to ensure that AI-technologies are applied ethically and responsibly to prevent unexpected negative outcomes.

On the other side, Chassignol et al. (2018) mention that AI-powered technologies can improve efficacy and interactivity throughout the learning processes; eventually, they can encourage more effective and engaging educational settings. AI-powered technologies can also enlighten and assist in several educational challenges, as AlSamhori et al. (2023) and Vazhayil et al. (2019) explored the need for increased awareness of AI education and improved infrastructural, specifically internet access, as well as difficulties in applying new pedagogical methods within the current educational context.

Nye (2014), discovered the ability of AI-powered technologies in developing nations to offer accessible and personalised education in low-resource settings, specifically in the developing countries of the world. Tarek Noour (2024) and Ali (2023), have utilised the demand for educational institutions in

Egypt to focus on facilitating involvement and autonomy to improve students' motivation in AI-technologies educational environments.

The future of AI-technologies in the educational background is promising, with continuous development and research in aspects like machine learning, natural language processing, and smart teaching systems. As AI technologies continue to develop, people can expect to see more effective and innovative and tools in the learning context. For applications instance. AI technologies based on smart teaching systems can offer more personalised assistance to students, adjusted to their individual pacing and demands (Marwan, 2020; Markauskaite et al., 2022; Luckin and Holmes, 2016; Burgsteiner et al., 2016). Simultaneously, Sætra (2021) has emphasised the role of AI-technologies in the global "Sustainable Development Goals" (SDGs) providing educational equalities and sustainability.

Overall, by synthesising all these revised studies, it is essential to understand that AI-technologies have the potential to revolutionise and transform educational circumstances across multiple learning levels, from primary education systems to higher education systems as well as technical training systems, by offering more custimizable, efficient, and adaptive educational environments.

In marketing related studies, papers like Labib (2024), Haleem et al. (2022), Taecharungroj and Karnchanapoo (2023), and Davenport et al. (2020) agreed on the robust impact of AI-technologies on several marketing sectors. In fact, Labib (2024) predicted organisations using AI-technologies in presenting data analysis reports will receive 75% enhancements in consumer experience and gain within the next 5 years almost 99% ROI—"return on investment," as well as 187% ROI with the next 10 years

AI-technologies like Generative-AI (GenAI) have emerged as a technological game changer in the marketing environment. In the paper of Deveau et al. (2023), GenAI has significantly and effectively improved the automation sales by 20%. Moreover, the research has stated that marketing institutions have invested in AI-technologies with revenue increases of between 3% to 15% and between 10% to 20% breakthroughs in the sales ROI. Remarkably, Deveau et al. (2023) mentioned that 90% of the marketing leaders have predicted to adopt and integrate AI-technologies into their systems within the upcoming 2 years, suggesting the AI-tools to improve individual consumer experiences. Similarly, Soni (2023) surveyed more than four hundred digital marketing professionals, emphasizing the concept of GenAI in marketing and focusing on "Scalability", "Efficiency", "Personalization", and "Content

Generation". In terms of GenAI adoption patterns, the results were significantly positive, with AI's adoption at 83%.

Similarly, Ponomarenko et al. (2024) discovered that AI-technologies in digital marketing particularly personalised content delivery, can lead to robust expansion in consumer loyalty and engagement. Companies can develop their marketing plans and better take care of their customers by generating instant sentiment assessments and automating customer service, according to the paper. In the respect of marketing education, Acar (2024) demonstrated how GenAI can transform marketing education by providing real-time personalised response experience; as GenAI's response on marketing tasks was shown to be 93% further cost-effective than humans's assessments while preserving the exact quality of constructive and detailed responses. The paper also suggests that GenAI also enables educators to generate immediate instructional materials and case studies customised to personal students' needs, allowing customisable educational experiences on a wide scale; as this method considerably enhances both engagement and accessibility in marketing education (Acar, 2024).

The research of Miikkulainen (2021) noted that website interfaces designed by AI-tools can enhance conversion rates by 45% compared to humandesigned website interfaces, which indicates AI's marketing competence in establishing more efficient results that may dodge the traditional solution processes. Bulchand-Gidumal et al. (2024) found that marketing for sectors like the tourism and hospitality industry had great impact and advancement thanks to AI technologies. Furthermore, the paper showed how AI can simplify and assist in automating marketing activities, optimize consumer support systems, and enhance personalization. However, the paper also highlighted the ethical implications concerns associated with the AItechnologies, specifically with regards to information management and data privacy.

On the same pathway, Kopalle et al. (2022) underlined the AI's global impact on the marketing manner, showing that AI's marketing competence can worsen and eliminate economic differences between nations. The research emphasised the necessity for AI-technologies apps that can assess cultural, market-certain elements, and ethical implications to target the privacy issues that occur from the huge data collection.

In the journy of exploring the AI in media, reviewed research revealed a range of advantages and challenges facing AI-technologies across multiplue media sectors and jobs including journalism. Khan's (2023) research, for example, found that AI-based technology suggestion platforms personalise user experiences, thereby positively impacting how people perceive media. It could alter advertising strategies by allowing hyper-targeted topics that are highly likely to convert and engage certain audiences, thereby increasing the effectiveness and efficiency of advertising campaigns.

Sančanin & Penjisevic (2022) mentioned that from content creation and collection to delivery and utilisation, AI-technologies are playing a vital duty in shaping all media production levels. As it may assist in forecasting the trending topics, personalising generated content, and linking diverse media channels through automated tagging. The adoption of AI-technologies in the media has been presented as a more smart technology able to mimic humans' cognitive behaviors. This counts the representation and filtering of sophisticated information and improving the communication between the audience and the digital content by enhanced media machine learning capable of leading more complex methods of generating. personalizating. communicating, and exchanging media data (Henry, 2019).

Equivalently, the paper of Trattner et al. (2021) agreed that AI-technologies, GenAI, and other technological advancements have a notable influence on the media industry, alongside the trend transition towards more automated media content creation and personalised media experiences. While this technological trend presents opportunities for improving media content delivery, it also presents challenges such as accelerating the dissemination of misinformation and preserving intellectual integrity. The findings of Sørensen & Hutchinson (2018) showed that (PSM) - Public service media institutions are rapidly integrated AI-driven algorithmic suggester technologies to improve content personalization; however, this increases the concerns towards user sovereignty, transparency, and dependency on profitable intermediaries.

The papers of Saleh (2023), Elaasser et al. (2024); Gouda (2022), Tiernan et al. (2023), Aissani et al. (2023), $({}^{\cdot}{}^{\cdot}{}^{\cdot}{}^{\cdot})$ pinto et al. (2024), (2024), (أطايل ${}^{\cdot}{}^{\cdot}{}^{\cdot}{}^{\cdot})$ and Robinson (2020) agreed that AI-technologies are facing huge ethical concerns, specifically regarding information privacy, bias, societal issues, and decision-making issues; as AI-technologies frequently depend on vast databases that might include inherent flaws. Elaasser et al. (2024) and $({}^{\cdot}{}^{\cdot}{}^{\cdot}{}^{\cdot})$, for instance, have discovered a remarkable shortage of AI awareness within the media newsrooms, which blocks the effective integration and adoption of AI-technologies. The papers also examined the multiple ethical dilemmas, like the well-known issues of bias and data privacy, but also the possibility of replacing human jobs by AI, highlighting the demand for stringent ethical guidelines over journalistic practices when using AI-technologies.

Conclusion and Discussion

RQ5: How has AI-literacy studies and development evolved from 2014-2024? The current study attempted to understand artificial intelligence (AI) and particularly AI-literacy across multiple industries and perspectives, including education, marketing, and media, by demonstrating a comprehensive research review to underline its revolutionised potential and its complexity of challenges. Most studies in the field of education, such as those by Sangapu (2018), Cassignol et al. (2018), Ali (2023), AlSamhori et al. (2023), Karal et al. (2014), Thornhill-Miller et al. (2023), Luckin & Cukurova (2019), and Roll & Wylie (2016), suggested the potential of AI technologies to revolutionise the educational environment for both students and teachers. However, almost all of them didn't mention the method or elaboration approach on how to evaluate the exposure to AI-technologies and concepts in early stages, as well as the lack of defining the preparation of educators and learners for a future dominated by AI-technologies.

In the AI-marketing perspective, most of the studies, like Acar (2024), Gyasi et al. (2019), Miikkulainen (2021), and Soni (2023), demonstrated the core concept of how AI-technologies can reshape customer engagement and interactions, as well as the development of generative AI-technologies (GenAI), which allowed the users to receive more personalised content and innovative marketing campaigns. However, this study found a shortage in presenting real cases of brands or organisations applying GenAI in their marketing or advertising campaigns; most of the studies highlight only the concepts of GenAI and generative technologies.

As from the AI-media perspective, it was explored by this paper that most of the studies focused only on the news media and journalism, noting the only article talked about digital and new media. Without a doubt, the majority of studies such as Saleh (2023), Elaasser et al. (2024), Trattner et al. (2021), and Sananin & Penjisevic (2022) have utilized core AI-driven technologies in media, particularly journalism, and have presented their findings regarding the ethical implications of AI in the future.

Overall, the adoption and integration of AI-technologies had presented notable transformations across different sectors, particularly the perspectives of education, marketing, and media. In fact, most of the studies agreed that AI-technologies not only improve operational effectiveness but also propose new ways of personalisation and creativity.

Furthermore, this study found a number of discussable areas, such as the availability of sources related to the topic, as the overall reviewed studies had shown a lack in mentioning AI-literacy in specific industries and sectors; plus

the lack of how to highlight core skills needed for each segiment. Similarly, compared to the low literature collected on marketing and media, the majority of the articles gathered were related to education, indicating the significant advancements in AI and education over the past few years.

Additionally, according to reviewed studies, this study have discovered that majority of the research uses theoritcil and secodnary review of literture as their main methodolical approaches in all the three different perspectives of this study with only few minor studies applied diversative approaches from questionaries and practical implementations to mix-methods. Furthermore, the theoretical frameworks used in most studies faced different AI-related models that could not fit most of the topics, and methodological approaches with more explanations and operational definitions are needed in the upcoming research.

Lastly, there is no doubt that this paper aimed to write and search in English language, but it was worth noting that most of the academic research was written in English language, with only two studies written in Arabic language. **Recommendations for future research topics**

Future research in AI should present a wider range of applicable perspectives, as this paper specifically focused on articles related to AI-literacy studies in the certain fields. However, the majority of academic work has only briefly mentioned the concept of literacy. Accordingly, this paper suggests the increase of AI-literacy related topics to ensure the development of the scientific research.

As a secondary recommendation, this paper only focused on educational, marketing, and media perspectives. Therefore, the next generation of research should cover more wide topics related to AI- technologies and "New Media/Digital Media"; "Branding"; "Advertising"; "Public Opinion"; also, it might be interested in the fields of "Hospitality and Tourism"; "Development and Real Estate".

Furthermore, this paper suggests also developing more primary and paractical methodological approaches, as most of the previous studies were emphasising the AI-technologies in only a systematic review of a literature. In fact, questionnaires, interviews, focusgroups, practical experiments, and more should be done in the near future to have more developed findings and results. Finally, as mentioned previously, only limited research was done in the Arabic language, and that needs development not only on the language scale but also on the country and regional scale. Thus, the future research should include more Arabic literature and Arab or Egyptian studies.

References

Acar, O. A. (2024). Commentary: Reimagining marketing education in the age of generative AI. *International Journal of Research in Marketing*, 41(3), 489–495. https://doi.org/10.1016/j.ijresmar.2024.06.004

Ahmad, M. F., & Wan Abdul Ghapar, W. R. G. (2019). The Era of Artificial Intelligence in Malaysian Higher Education: Impact and Challenges in Tangible Mixed-Reality Learning System toward Self Exploration Education (SEE). *Procedia Computer Science*, *163*, 2–10. https://doi.org/10.1016/j.procs.2019.12.079

Aissani, R., Abdallah, R., Taha, S., & Al Adwan, M. N. (2023). Artificial Intelligence Tools in Media and Journalism: Roles and Concerns. 19–26. https://doi.org/10.1109/MCNA59361.2023.10185738

Ali, A. (2023). Assessing Artificial Intelligence Readiness of Faculty in Higher Education: Comparative Case Study of Egypt. *Theses and Dissertations*. <u>https://fount.aucegypt.edu/etds/2096</u>

Almohammadi, K., Hagras, H., Alghazzawi, D., & Aldabbagh, G. (2017). A Survey of Artificial Intelligence Techniques Employed for Adaptive Educational Systems within E-Learning Platforms. *Journal of Artificial Intelligence and Soft Computing Research*, 7(1), 47–64. <u>https://doi.org/10.1515/jaiscr-2017-0004</u>

AlSamhori, J. F., AlSamhori, A. R. F., Shnekat, H. H., AlSamhori, A. F., & Abdallat, S. (2023). Attitude, Awareness, and Understanding of Artificial Intelligence AI among Medical and Dental Students in Jordan: A Cross-Sectional Study. *International Journal of Medical Students*, S93–S93. <u>https://doi.org/10.5195/ijms.2023.2381</u>

Alzahrani, A. (2022). A systematic review of artificial intelligence in education in the arab world. *Revista Amazonia Investiga*, 11(54), 293–305. <u>https://doi.org/10.34069/AI/2022.54.06.28</u>

Beheshti, M., & Pakfar, A. (2014). Using Intelligent Educational Technology in Computer Network. *Procedia - Social and Behavioral Sciences*, *116*, 2994–2997. <u>https://doi.org/10.1016/j.sbspro.2014.01.695</u>

Bizami, N. A., Tasir, Z., & Kew, S. N. (2023). Innovative pedagogical principles and technological tools capabilities for immersive blended learning: A systematic literature review. *Education and Information Technologies*, 28(2), 1373–1425. https://doi.org/10.1007/s10639-022-11243-w

Bulchand-Gidumal, J., William Secin, E., O'Connor, P., & Buhalis, D. (2024). Artificial intelligence's impact on hospitality and tourism marketing: Exploring key themes and addressing challenges. *Current Issues in Tourism*, 27(14), 2345–2362. https://doi.org/10.1080/13683500.2023.2229480

Burgsteiner, H., Kandlhofer, M., & Steinbauer, G. (2016). IRobot: Teaching the Basics of Artificial Intelligence in High Schools. *Proceedings of the AAAI Conference on Artificial Intelligence*, *30*(1), Article 1. <u>https://doi.org/10.1609/aaai.v30i1.9864</u>

Chassignol, M., Khoroshavin, A., Klimova, A., & Bilyatdinova, A. (2018). Artificial Intelligence trends in education: A narrative overview. *Procedia Computer Science*, *136*, 16–24. <u>https://doi.org/10.1016/j.procs.2018.08.233</u>

da Costa, R., & Hall, S. (2016). Whose Reality? A Meta-Analysis of Qualitative Research in International and Comparative Education. *Qualitative Report*, 21, 661–676. <u>https://doi.org/10.46743/2160-3715/2016.2252</u> Davenport, T., Guha, A., Grewal, D., & Bressgott, T. (2020). How artificial intelligence will change the future of marketing. *Journal of the Academy of Marketing Science*, *48*(1), 24–42. <u>https://doi.org/10.1007/s11747-019-00696-0</u>

Deveau, R., Griffin, S. J., & Reis, S. (2023). AI-powered marketing and sales reach new heights with generative AI.

Elaasser, S., Oaf, M. A., & Tayie, S. (2024). Experts' perception of artificial intelligence knowledge in Egyptian newsrooms. *Insights into Language, Culture and Communication*, 4(1), Article 1. <u>https://doi.org/10.21622/ILCC.2024.04.1.749</u>

Gavurova, B., Skare, M., Hynek, N., Moravec, V., & Polishchuk, V. (2024). An information-analytical system for assessing the level of automated news content according to the population structure – A platform for media literacy system development. *Technological Forecasting and Social Change*, 200, 123161. https://doi.org/10.1016/j.techfore.2023.123161

Goel, A. K., & Joyner, D. A. (2017). Using AI to Teach AI: Lessons from an Online AI Class. *AI Magazine*, *38*(2), 48–58. <u>https://doi.org/10.1609/aimag.v38i2.2732</u>

Gouda, H. (2022). Exploring the effects of learning abilities, technology and market changes on the need for future skills. *Higher Education, Skills and Work-Based Learning, 12*(5), 900–913. <u>https://doi.org/10.1108/HESWBL-10-2021-0200</u>

Gyasi, E. A., Handroos, H., & Kah, P. (2019). Survey on artificial intelligence (AI) applied in welding: A future scenario of the influence of AI on technological, economic, educational and social changes. *Procedia Manufacturing*, *38*, 702–714. https://doi.org/10.1016/j.promfg.2020.01.095

Haleem, A., Javaid, M., Asim Qadri, M., Pratap Singh, R., & Suman, R. (2022). Artificial intelligence (AI) applications for marketing: A literature-based study. *International Journal of Intelligent Networks*, *3*, 119–132. <u>https://doi.org/10.1016/j.ijin.2022.08.005</u>

Henry, R. (2019). Role of Artificial Intelligence in New Media (Technology based perspective). *CSI Communications*, 42, 23–25.

How, M.-L., & Hung, W. L. D. (2019). Educing AI-Thinking in Science, Technology, Engineering, Arts, and Mathematics (STEAM) Education. *Education Sciences*, 9(3), 184. <u>https://doi.org/10.3390/educsci9030184</u>

Kandlhofer, M., Steinbauer, G., Hirschmugl-Gaisch, S., & Huber, P. (2016). Artificial intelligence and computer science in education: From kindergarten to university. *2016 IEEE Frontiers in Education Conference (FIE)*, 1–9. 2016 IEEE Frontiers in Education Conference (FIE). <u>https://doi.org/10.1109/FIE.2016.7757570</u>

Karal, H., Nabiyev, V., Erümit, A. K., Arslan, S., & Çebi, A. (2014). Students' Opinions on Artificial Intelligence based Distance Education System (Artimat). *Procedia - Social and Behavioral Sciences*, *136*, 549–553. <u>https://doi.org/10.1016/j.sbspro.2014.05.374</u>

Khan, M. H. (2023). The Impact of AI on the Media Industry. *Uppsala University Department of Informatics and Media*.

Kopalle, P. K., Gangwar, M., Kaplan, A., Ramachandran, D., Reinartz, W., & Rindfleisch, A. (2022). Examining artificial intelligence (AI) technologies in marketing via a global lens: Current trends and future research opportunities. *International Journal of Research in Marketing*, *39*(2), 522–540. <u>https://doi.org/10.1016/j.ijresmar.2021.11.002</u>

Labib, E. (2024). Artificial intelligence in marketing: Exploring current and future trends. *Cogent Business* & *Management*, *11*(1), 2348728. https://doi.org/10.1080/23311975.2024.2348728 Luckin, R., & Cukurova, M. (2019). Designing educational technologies in the age of AI: A learning sciences-driven approach. *British Journal of Educational Technology*, *50*(6), 2824–2838. <u>https://doi.org/10.1111/bjet.12861</u>

Luckin, R., & Holmes, W. (2016). Intelligence Unleashed: An argument for AI in Education.

Markauskaite, L., Marrone, R., Poquet, O., Knight, S., Martinez-Maldonado, R., Howard, S., Tondeur, J., De Laat, M., Buckingham Shum, S., Gašević, D., & Siemens, G. (2022). Rethinking the entwinement between artificial intelligence and human learning: What capabilities do learners need for a world with AI? *Computers and Education: Artificial Intelligence*, *3*, 100056. <u>https://doi.org/10.1016/j.caeai.2022.100056</u>

Marwan, A. (2020). Impact of artificial intelligence on education for employment: (Learning and employability Framework). *Theses and Dissertations*. <u>https://fount.aucegypt.edu/etds/840</u>

Miikkulainen, R. (2021). Creative AI Through Evolutionary Computation: Principles and Examples. *SN Computer Science*, *2*(3), 163. https://doi.org/10.1007/s42979-021-00540-9

Mohammed Mahmoud Ghoneim, N., & Elsayed Abdelsalam Elghotmy, H. (2021). Using an Artificial Intelligence Based Program to Enhance Primary Stage Pupils' EFL Listening Skills. المجلة التربوية لكلية التربية بسوهاج. <u>https://doi.org/10.21608/edusohag.2021.140694</u>

Moses, E. (2024). Artificial Intelligence (AI) Literacy, An Investment for Enhancing Educators' Skills in AI Powered Primary Schools in Nigeria. *International Journal of Research and Innovation in Social Science*.

https://rsisinternational.org/journals/ijriss/articles/artificial-intelligence-ai-literacy-an-

investment-for-enhancing-educators-skills-in-ai-powered-primary-schools-in-nigeria/ Mousa, K. M. (2024). *Leadership Dynamics in Higher Education: An Integrated Model Exploring the Role of AI-Literacy, and Gender in the China.* https://doi.org/10.20944/preprints202406.0088.v1

Ng, D. T. K., Leung, J. K. L., Chu, K. W. S., & Qiao, M. S. (2021). AI Literacy: Definition, Teaching, Evaluation and Ethical Issues. *Proceedings of the Association for Information Science and Technology*, 58(1), 504–509. https://doi.org/10.1002/pra2.487

Ng, D. T. K., Su, J., Leung, J. K. L., & Chu, S. K. W. (2023). Artificial intelligence (AI) literacy education in secondary schools: A review. *Interactive Learning Environments*. <u>https://www.tandfonline.com/doi/abs/10.1080/10494820.2023.2255228</u>

Nye, B. D. (2014). Intelligent Tutoring Systems by and for the Developing World: A Review of Trends and Approaches for Educational Technology in a Global Context. *International Journal of Artificial Intelligence in Education*, 25(2), 177–203. https://doi.org/10.1007/s40593-014-0028-6

Pinto, M., Garcia-Marco, J., Caballero, D., Manso, R., Uribe, A., & Gomez, C. (2024). Assessing information, media and data literacy in academic libraries: Approaches and challenges in the research literature on the topic. *The Journal of Academic Librarianship*, *50*(5), 102920. <u>https://doi.org/10.1016/j.acalib.2024.102920</u>

Ponomarenko, I. V., Pavlenko, V. M., Morhulets, O. B., Ponomarenko, D. V., & Ukhnal, N. M. (2024). Application of artificial intelligence in digital marketing [Journalarticle]. *CS&SE@SW 2023: 6th Workshop for Young Scientists in Computer Science & Software Engineering*, 155. <u>https://ceur-ws.org/Vol-3662/paper22.pdf</u>

Potode, A., & Manjare, P. (2015). E-Learning Using Artificial Intelligence. In *International Journal of Computer Science and Information Technology Research* (Vol. 3, Issue 1, pp.

78–82). https://www.researchpublish.com/upload/book/E-

Learning%20Using%20Artificial%20Intelligence-1034.pdf

Qing, M., Crosthwaite, P., Sun, D., & Zou, D. (2024). Exploring ChatGPT literacy in language education: A global perspective and comprehensive approach. *Computers and Education: Artificial Intelligence*, 7, 100278. <u>https://doi.org/10.1016/j.caeai.2024.100278</u>

Robinson, S. C. (2020). Trust, transparency, and openness: How inclusion of cultural values shapes Nordic national public policy strategies for artificial intelligence (AI). *Technology in Society*, *63*, 101421. <u>https://doi.org/10.1016/j.techsoc.2020.101421</u>

Roll, I., & Wylie, R. (2016). Evolution and Revolution in Artificial Intelligence in Education. *International Journal of Artificial Intelligence in Education*, 26(2), 582–599. https://doi.org/10.1007/s40593-016-0110-3

Sætra, H. S. (2021). AI in Context and the Sustainable Development Goals: Factoring in the Unsustainability of the Sociotechnical System. *Sustainability*, *13*(4), 1738. <u>https://doi.org/10.3390/su13041738</u>

Saleh, H. F. (2023). AI in media and journalism: Ethical challenges. *EJPOR*. <u>https://joa.journals.ekb.eg/article_334084_c8ea3031f6736bcda644879d7374a0e1.pdf?lang=</u> en

Saleh,Z.(2019).ArtificialIntelligenceDefinition,EthicsandStandards.ResearchGate.https://www.researchgate.net/publication/332548325_Artificial IntelligenceDefinition_Ethics_and_Standards

Sančanin, B., & Penjisevic, A. (2022). Use of Artificial Intelligence for the Generation of Media Content. *Social Informatics Journal*, *1*, 1–7. <u>https://doi.org/10.58898/sij.v1i1.01-07</u>

Sangapu, I. (2018). Artificial Intelligence in Education—From a Teacher and a Student Perspective (SSRN Scholarly Paper No. 3372914). <u>https://doi.org/10.2139/ssrn.3372914</u>

Sharawy, F. (2023). The Use of Artificial Intelligence in Higher Education: A Study on Faculty Perspectives in Universities in Egypt. *Theses and Dissertations*. <u>https://fount.aucegypt.edu/etds/2095</u>

Sharma, R., Fantin, A.-R., Prabhu, N., Guan, C., & Dattakumar, A. (2016). Digital literacy and knowledge societies: A grounded theory investigation of sustainable development. *Telecommunications Policy*, 40(7), 628–643. <u>https://doi.org/10.1016/j.telpol.2016.05.003</u>

Soni, V. (2023). Adopting Generative AI in Digital Marketing Campaigns: An Empirical Study of Drivers and Barriers.

Sørensen, J. K., & Hutchinson, J. (2018). Algorithms and Public Service Media. *Research Gate*. <u>https://www.researchgate.net/publication/324438875_Algorithms_and_Public_Servic_e_Media</u>

Sywelem, M. M. G., & Mahklouf, A. M. E.-S. (2024). Ethical Considerations in the Integration of Artificial Intelligence in Education: An Overview. *Education & Information Technology*, 01–15. <u>https://doi.org/10.5121/csit.2024.141201</u>

Taecharungroj, V., Karnchanapoo, K., & AI Governance Clinic Expert Fellows. (2023). AI Literacy in the Age of Generative AI — Building a Future-Ready Society. *Edta*.

Tarek Noour, A. (2024). The Motivations of Virtual Learning For Artificial Intelligence Learner In Egyptian Higher Education. المجلة العلمية للدر اسات التجارية والبيئية, 15(2), 813–878. https://doi.org/10.21608/jces.2024.361692

Thornhill-Miller, B., Camarda, A., Mercier, M., Burkhardt, J.-M., Morisseau, T., Bourgeois-Bougrine, S., Vinchon, F., El Hayek, S., Augereau-Landais, M., Mourey, F., Feybesse, C., Sundquist, D., & Lubart, T. (2023). Creativity, Critical Thinking, Communication, and Collaboration: Assessment, Certification, and Promotion of 21st Century Skills for the Future of Work and Education. *Journal of Intelligence*, *11*(3), 54. https://doi.org/10.3390/jintelligence11030054

Tiernan, P., Costello, E., Donlon, E., Parysz, M., & Scriney, M. (2023). Information and Media Literacy in the Age of AI: Options for the Future. *Education Sciences*, *13*(9), Article 9. <u>https://doi.org/10.3390/educsci13090906</u>

Trattner, C., Jannach, D., Motta, E., Meijer, I., Diakopoulos, N., Elahi, M., Opdahl, A., Tessem, B., Borch, N., Fjeld, M., Øvrelid, L., Smedt, K., & Moe, H. (2021). Responsible media technology and AI: Challenges and research directions. *AI and Ethics*, 2. <u>https://doi.org/10.1007/s43681-021-00126-4</u>

Van Duin, S., & Bakhshi, N. (2018). Artificial Intelligence. In Proposal Title Goes Here / Section Title Goes

Here. https://www2.deloitte.com/content/dam/Deloitte/nl/Documents/deloitte-

analytics/deloitte-nl-data-analytics-artificial-intelligence-whitepaper-eng.pdf

Vazhayil, A., Shetty, R., Bhavani, R. R., & Akshay, N. (2019). Focusing on Teacher Education to Introduce AI in Schools: Perspectives and Illustrative Findings. 2019 IEEE Tenth International Conference on Technology for Education (T4E), 71–77. https://doi.org/10.1109/T4E.2019.00021

Wang, S., Wang, F., Zhu, Z., Wang, J., Tran, T., & Du, Z. (2024). Artificial intelligence in education: A systematic literature review. *Expert Systems with Applications*, 252, 124167. <u>https://doi.org/10.1016/j.eswa.2024.124167</u>

السيد، ش. (٢٠٢٤). الدراية بالذكاء الاصطناعي في الصحافة.. الأشكاليات والآليات والتحديات AI literacy. المجلة العلمية لدر اسات الإعلام الرقمي والرأي العام <u>https://doi.org/10.21608/dmpos.2024.290076.1013</u>. طايل، إ. م. خ. (٢٠٢٢). الذكاء الاصطناعي وآثاره على سوق العمل مجلة الدر اسات القانونية والاقتصادية , 8(4) , 713–719. https://doi.org/10.21608/jdl.2022.272407

عبدالرازق، م. م. (٢٠٢٢). تقنيات الذكاء الاصطناعي في الإعلام ..الواقع والتطورات المستقبلية :*المجلة المصرية* البح*وث الأعلام* 2022(81), 1–74. <u>https://doi.org/10.21608/ejsc.2022.272038</u>,