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Evaluating Trustworthiness of Artificial Intelligence (AI) Applications in Education

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ABSTRACT

Artificial intelligence (AI) is a high-paced evolving technology that is now being implemented on internet platforms. This massive advancement has the capability to drastically change our daily lives as humans, especially in the educational sector. AI is user-friendly and can assist in students' research work. AI-powered robots are being used to enhance the efficiency and convenience of daily tasks. This research focused on the factors of trustworthiness in AI applications that need to be further investigated.

INTRODUCTION

The evolution of technology has introduced the creation and development of smart applications which has transformed the way users communicate by removing all boundaries. Smart devices such as mobile phones, tablets, and smart watches facilitate the way users connect with one another. With the advent of Artificial Intelligence (AI), a new version of technology with the combination of human and robot has emerged (Mohsen, Arezoo, Dastres, 2023). This integration is commonly referred as artificial intelligence commonly abbreviated to AI. AI is characterized by computer systems that are programmed to enhance and optimize human behaviour and roles (Schalkoff, 1990; Russell & Norvig, 2016). AI applications have freed people's mind to explore new research related to the use of AI applications in their lifestyle which involve

the replication of human behaviour and working style. Due to that, AI has gained significant recognition and popularity. The Industrial Revolution 4.0 (IR) industry has eventually had to give way to the advancement of computer technology. Malaysia's AI roadmap (2021-2025) has outlined a potential of 1.2 per cent growth in GDP which derives from AI expansion around 4.4% as per the statistical data provided by Ministry of Science, Technology and Innovation (MOSTI, 2021).

The use of AI in Malaysia is not new as most people are aware and ready to accept the impact in their daily life activities. According to the data retrieved from the ministry, the lack of AI related talent is a concern involving ethical implications, privacy concerns and digital literacy. These elements need to be considered further as people become more dependent on AI. With the increasing use of AI applications, there is a need for infrastructure improvements like high-speed internet, fibre optics, and 5G networks to handle the growing internet traffic efficiently (Sharma, 2024). In relation to education, the revolution of information technology has modernized educational processes and practices related to teaching and learning. A recent study by Atlas (2023) illustrates the integration of AI in education has revolutionized the execution of various educational tasks include writing assignments, constructing research papers, conducting literature reviews, brainstorming ideas, creating presentation slides, and more. The use of AI is not only limited to writing but also AI-powered language tools are being used for academic communication in learning and assessment (Amy, Christian & Hans, 2024). The Vice Chancellor of Universiti Teknologi Malaysia (UTM) Malaysia highlighted that graduates need to develop their skills in digital content to align with IR5.0 to cater to the demand for AI experts especially in postgraduate studies. Several strategies have been highlighted as shown in *Figure 1*. Strategy 5.0 focuses on industrialization which human work alongside AI.

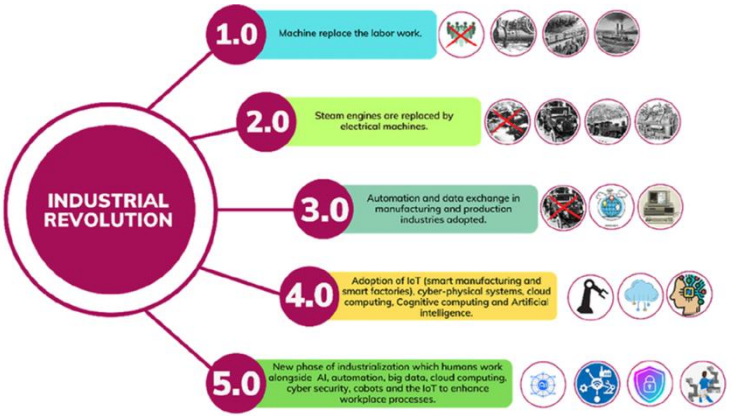

Figure 1: Industrial Revolution 5.0 (IR5.0, 2024)

Above that, he also emphasized that AI education is crucial in order to guarantee that everyone has access to the fundamental information needed to thrive in the globalised world (Halimy, 2024). The use of AI in various human endeavours has the potential of eliminating human errors, biases, and risks, while providing accessibility at all times (Aslamiah, 2024). The benefits of using AI, including reducing human error, automating tasks, handling large amounts of data, enabling quick decisions, carrying out risky tasks, improving processes, supporting healthcare, and providing full-time accessibility as stated by Maheshwari (2023). AI applications e.g., ChatGPT is a creation that has significantly impacted the realm of AI, it is widely recognized for its exceptional ability to understand and generate human-like text. In addition, smartphones via voice assistants have been practically used to transform human voice and interaction with computers (UNESCO, 2023). Thus, the use of AI technologies has impacted our daily lives slowly but surely, especially through the use of smartphones and its features, i.e., Siri, Google Assistant, and face recognition. All these features have transformed the way people communicate, engage in daily life activities such as entertainment, teaching and learning, and much more with devices such computers, tablets or even

mobile phones. A study in Malaysia found that students who incorporated AI chatbots into their learning experience reported a significant improvement in their quality of online learning (Neo, 2022). AI optimises information search where all information related to the field requested are made available in a matter of seconds. However, the downside of such unlimited and unparalleled abundance of information is that the user will still need to determine the reliability of the sources of the information, which is a crucial consideration especially where authenticity is a primary concern.

LITERATURE REVIEW

Previous Study on Information Seeking Using Artificial Intelligence Applications

In the social media age, people like to use Facebook, Instagram, WhatsApp, WeChat, Snapchat, Twitter, other available social media platform in order to seek for information. The used of social media nowadays heightens information provider to feed information in online platforms where the use of Artificial Intelligence (AI) application has been introduced. The use of AI and digital communication technologies provide a better opportunity for online business especially in getting new sources of information rather than focus on information they received from non-media sources or in printed version. In order to fulfil their information needs, there are several issues need to be discovered. AI are being use in many sectors where one of the sector is in education platform. A study revealed by Popenici & Kerr (2017), AI application is capable to engaging in education where the process of learning, adapting, synthesising, self-correction which being used for complex processing task. The tools that AI provide in providing the revolutionise in the field of education and learning whereby it provides personalised educational experiences and intelligent tutoring systems.

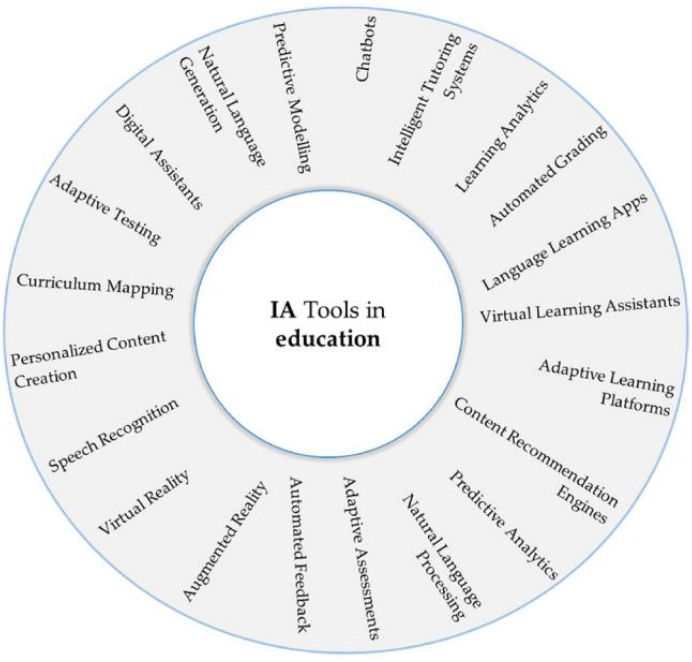

Figure 2: AI Tools application for education

Consequently, *Figure 2* showed the depicts some AI tools used in education and learning, such as chatbots, intelligent tutoring systems, learning analytics, automated grading, and many more. Hence, one

area of AI that has sparked a lot of interest is the development of Chatbots, also known as conversational agents, which are designed to converse with humans via messaging services, websites, or voice assistants. AI has been used in education sector where one of the tools are widely use is Chatbots which the ability to automate a variety of processes and offer lots of features for their customer. However, specialists have pointed out several weaknesses and threats of these tools, including failure in user intent understanding, and data security (Adamopoulou & Moussiades, 2020). Despite the widely use of AI application in seeking for information, there are several dimensions need to be further investigate in order to measure the accuracy, reliability in terms of the information quality that they retrieved. Perhaps, peoples might be easily miss-use the application in plagiarism the information received. In order to measure the level of trustworthiness of the information received from the AI application, Social Cognitive Theory has been practice.

Information Seeking Using Artificial Intelligence Applications

Artificial Intelligence (AI) application has been broadly used in many sector where people intended to use this application as part as their daily life. An AI provide enamours benefit to human life such as the use of Siri, search engines, self-driving car, chatbots, telemedicine, Maps and Navigation and others where accessible in current markets. With rapidness of the advancement of technology and computer, the use of AI in information seeking has broadly involved. Information-seeking is a goal-driven or purposive process to satisfy information needs traditionally been the subject of studies on information seeking behaviour. In human seeking behaviour, information seeking being closely related to information retrieval whereby Wilson (2000) have proposed a problem solving on the model which there is a way of integrating research in the field and proposed a global model. Nakamura (2022) indicated that further research is needed to address difficulties surrounding information seeking behaviour. Artificial intelligence research suggests that knowledge seeking involves two steps: choosing inquiries and modifying opinions based on results. This article discusses the criteria for query selection.

In today's information-rich society, it is important for individuals to be able to discern and ascertain the specific information they require. With the diverse range of information available, it is important for people to have a clear understanding of their own unique information needs. By doing so, they can easily access and delve into the specific details of the information that is most relevant to them. According to the study conducted by Xiumei et al (2023), researcher reveals that older adults' behaviour towards searching for health information online is significantly influenced by their perception of the benefits of using the internet. Surprisingly, this influence is found to be more impactful than the importance of health awareness in this particular context. The use of the internet to seek information has a significant impact on the quality and reliability of the retrieved information. However, there are several issues that need to be considered, particularly when it comes to health information. The abundance of information available on the internet can be overwhelming, making it challenging for individuals to filter and assess its usefulness. As a result, there is a need for caution and discernment when relying on internet sources for health-related information. A study conducted by Minsun & Heui (2020) examined the impact of service quality on user satisfaction and perceived benefits. The findings showed that service quality had a significant influence on user satisfaction, which in turn indirectly affected the perceived benefits.

With the advent of the internet and Artificial Intelligence (AI) application the way people use information has dramatically changed. AI has been used to communicate, exchange, sharing and seeking for information. People used AI not only for communicating with each other but they also used AI as a platform in seeking for the information anywhere and anytime. AI applications in information seeking can assist in verifying the accuracy of perceived information by utilizing valid sources. Thus, Wang (2024) revealed that his research on AI Self-Efficacy is an important breakthrough in designing and validating an AISE scale. Their findings will add to our understanding of AISE and might help in the development of new assumptions as well as helping educators and practitioners in evaluating individuals' AISE and

recognising related behaviours. (Bandura, 1977, 1986, 1997) define Self-Efficacy refers to an individual's belief in his or her ability to conduct the behaviours required to achieve specified performance goals which confidence to control their own motivation, behaviour, and social environment.

Previous study revealed that self-efficacy is based on mastery experiences (e.g. interpreting daily sleep behaviour), vicarious experiences (e.g. sibling modelling), and social persuasion from others (Shumenghui, et al, 2023). There are lots of AI application available in the market such as ChatGPT, Siri, smart parking and etc. Furthermore, Boubker (2023) reported that his studies show that output quality influences perceived utility, AI applications such as ChatGPT has been use and student improve student satisfaction. Similarly, social influence has a major impact on perceived utility and ChatGPT use. The utilization of AI application has been practiced in various sector. Based on the research by Andreas, et al. (2022), the integration of AI and especially Machine Learning, has revolutionized several sectors including education fields. Their study concentrates on how these technological advancements are harnessing the production of trustworthy, high-quality journalism.

Information Seeking in Using Artificial Intelligence Applications in Malaysia

Information-seeking is a goal-driven or purposive process to satisfy information needs traditionally been the subject of studies on information seeking behaviour. In human seeking behaviour, information seeking being closely related to information retrieval whereby Wilson (2000) have proposed a problem solving on the model which there is a way of integrating research in the field and proposed a global model. With the advent of the Internet and latest social media application the way people use information has dramatically changed. Social media has been used to communicate, exchange, sharing and seeking for information. People used social media not only for communicating with each other but them also use social media as a platform in seeking for the information anywhere and anytime. From previous study, many scholars revealed that people used social media to look for information related to academic, health, food, travel, business, and others. According to Hamid and Bukhari (2015) findings showed that international students vigorously used social media in looking for information related to academic purposes which provide necessary support for them. With the driven use of computer and technology, Artificial Intelligence (AI) application has taken place. AI has been use in various sector as shown in *Figure 3*.

Figure 3: Type of AI Applications

In education, Roadmap 2021-2025 (AI-RMAP) indicated that AI adoption has been offered for academic programme in 17 Malaysia public and private Universities which involve undergraduate and postgraduate students. It shows that AI has been taking over in many sectors where it involve in healthcare, automobile, finance, surveillance, social media, entertainment, education, space exploration, gaming, robotics, agriculture and e-commerce (Techvidvan, 2023). The study conducted by Alberto et al. (2024) revealed that the investigation on the utilization and effects of Artificial Intelligence (AI) tools in higher education, specifically in a private university in Latin America, yielded noteworthy findings. The results demonstrated a highly favourable impact of (AI) tools on students' academic experiences, including improved understanding, innovation, and efficiency. The integration of AI applications in the field of education includes a wide range of tools such as JenniAI, Summarizer, Quiltbolt, Instatext, Grammarly, ChatGPT, Paraphrasing Tools, Paperpal, Samwell AI, Yomu AI, Writefull Academizer, and various others (Raad et al, 2023, Google Scholar, 2024). Remarkably, the study also identified areas of low and high integration, which serve as a useful diagnostic tool for the institution. Thus, it will make a young generation especially for those who are IT literate be influenced by the use of AI in life.

LIMITATIONS AND RECOMMENDATIONS

This study's limitations include the prior requirement on particular target groups within selected public universities and professional practices in Malaysia. This research emphasizes on a subset of 20 public universities. According to Ministry of Higher Education (2023), it is estimated that totals of 2,576,471 individuals representing the student population. As stated by the Department of Statistics Malaysia (2023), the study also takes into account 1,961,000 professionals whose knowledge and work needs are directly related to technological developments. Due to its narrow emphasizement, the findings may not be as widely applicable. Furthermore, even the study acknowledges the increasing dependence on AI applications for information retrieval, it does not comprehensively address the disparities in access or acceptance of these technologies among various demographics. Consequently, this study recommends that future research can expand the focus group consisting of other specific and marginalised groups, such as students and teachers in rural locations. Adopting and practicing of AI technology have raise concerns on trust issues, which may lead to unique obstacles. Useful insights on the encountered challenges shall be obtained by investigating these groups. Its consist of limited access to resources, technological infrastructure, or training, all of which can significantly affected their capabilities to engage with AI applications effectively. Broadening the scope in this way will not only enhance the generalisability of the findings, but also foster a more comprehensive understanding of AI's role in diversified educational and professional contexts.

CONCLUSION AND DISCUSSION

Perceptions of trustworthiness affect AI usage and people’s behaviour needs further investigation. A previous study has provided empirical support for why trustworthiness in AI usage matters (Andreas, 2023, Neyazi et al. 2023, & Chen and Tu, 2021). The study findings demonstrated that 74% of acceptance is attributed to the perception of trustworthiness in AI systems. It shows that the more users perceive AI systems as trustworthy and willing to trust these systems, the more likely they are to accept and embrace these technologies. Thus, this emphasizes the importance of building trust in AI to ensure its successful adoption. Nevertheless, as AI grows and diversifies, it is vital that studies regularly evaluate public confidence and expectations of AI systems to ensure that the use of AI remains consistent with and satisfies increasing societal demands (Gillespie et al, 2023). AI plays a crucial role in Human AI Collaboration, and its predictability and reliability are vital where these elements significantly influence human trust in AI (Ryan, 2020). The increasing popularity of AI applications as teaching and learning tools despite some educators' scepticism regarding their credibility and accuracy. It emphasizes the need to improve AI systems' accuracy, ensure compatibility with older versions, and prioritize user experience to maintain trust between humans and AI. Additionally, it highlights the importance of ethics in strengthening the

trustworthiness and credibility of AI in search engines for reliable information seeking (Sumandal, 2023). Therefore, it is important to enhance the accuracy of AI systems, and equally important to ensure compatibility with previous versions and prioritize user experience because neglecting to do so could damage the trust that has been established between humans and AI (Bansal et al., 2019)

Furthermore, this study aims to significantly enhance the ability of students and professionals to access accurate information using AI applications. By actively engaging with these technologies, users can improve their capacity to obtain reliable and up-to-date data. The research provides valuable guidance on building trust in AI applications through user-friendly and intuitive interfaces. Libraries and Information Centres can leverage these insights to optimize their tools and platforms, ensuring better user experiences. Additionally, incorporating an ethical AI training module alongside existing information literacy programs can equip users with essential skills for navigating AI technologies responsibly. Hence, this study contributes to advancing research across various fields, offering a robust foundation for developing new theoretical frameworks and deepening the understanding of AI self-efficacy in assessing information reliability. Furthermore, it is also support and aligns with Malaysia's Sustainable Development Goals, particularly in promoting inclusive and equitable education for lifelong learning opportunities.

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