Assessing AI Literacy Levels among Fresh Technology Undergraduates: A Case Study in a State University in Sri Lanka

S. Chandrasena[1], Y. H. P. S. S. Pathirathna[2], T. H. A. S. H. Niranjala[3], K. K. A. H. Kumarasinghe[4]
University of the Visual and Performing Art[1]
Gampaha Wickramarachchi University of Indigenous Medicine[2,3&4]
schandrasena@gmail.com

Abstract

This study assesses AI literacy levels among fresh technology undergraduates at a state university in Sri Lanka, focusing on the influence of demographic factors, prior experience, and access to AI learning resources on AI literacy and related career perceptions. Utilizing a quantitative cross-sectional design, data were collected from 109 students through an online questionnaire. The analysis revealed that demographic factors (age, gender, major) and prior programming experience did not significantly influence AI literacy levels. Additionally, accessing online AI courses and participating in AI-related extracurricular activities showed marginal to no significant impact on AI literacy. The findings suggest that AI literacy is consistent across diverse student groups, highlighting the need for structured AI education that integrates practical learning and ethical considerations. The study emphasizes the importance of comprehensive AI education strategies that extend beyond technical skills to include career guidance and exposure to real-world AI applications. Recommendations include enhancing AI curriculum integration, providing targeted practical experiences, and fostering inclusive learning environments. Future research should explore additional factors influencing AI literacy, investigate the impact of specific educational interventions, and expand studies to diverse educational contexts to further understand AI literacy development.

Keywords: *AI Literacy, Technology Undergraduates, Educational Interventions, AI Career Perceptions.*

Introduction

Artificial Intelligence (AI) is transforming industries such as healthcare, finance, education, and entertainment, driving significant advancements and creating a demand for skilled professionals. As AI technologies continue to advance, AI literacy has emerged as a crucial competency, particularly for students in technology-related fields. AI literacy includes understanding AI concepts, programming skills, ethical considerations, and effective communication about AI (Long & Magerko, 2020). Developing AI literacy among technology undergraduates is essential for equipping them with the skills needed to engage critically with AI, evaluate its impacts, and pursue careers in AI-driven fields (McDonald et al., 2021). This study assesses AI literacy levels among fresh technology undergraduates at a state university in Sri Lanka, identifies factors influencing these levels, and explores the relationship between AI literacy and students' perceptions and interest in AI-related careers.

The integration of AI into various sectors has led to improvements such as enhanced diagnostic accuracy in healthcare, personalized financial services, adaptive learning systems in education, and better user experiences in entertainment (Smith, 2020). These advancements highlight the importance of cultivating a workforce proficient in AI, including roles like AI engineers, data scientists, machine learning specialists, and AI ethicists (Lee & Shin, 2020). Universities play a vital role in preparing students for these roles by incorporating AI into curricula, offering hands-on experiences, and fostering a learning environment that encourages exploration and innovation in AI (McDonald et al., 2021).

In Sri Lanka, there is an increasing recognition of AI's potential, prompting higher education institutions to prioritize AI education, especially in technology-related fields. However, effectively preparing students for AI-related careers requires a clear understanding of the current level of AI literacy among technology undergraduates. This understanding can guide the development of educational strategies that address gaps in AI knowledge and skills, enhancing

the overall quality of AI education in Sri Lankan universities (Lee & Shin, 2020). Despite the growing importance of AI, there is limited research on AI literacy levels among technology undergraduates in Sri Lanka. AI literacy, which includes the knowledge, skills, and attitudes necessary to understand, use, and create AI technologies, is a critical skill set for technology students (Long & Magerko, 2020). However, the lack of empirical data on AI literacy levels among Sri Lankan undergraduates hinders the development of targeted educational interventions and curriculum improvements.

Assessing the AI literacy levels of fresh technology undergraduates provides a baseline understanding of their AI knowledge and skills at the start of their academic journey. By examining factors such as demographic characteristics, prior AI experience, and access to learning resources, educators can design more effective teaching strategies and support systems (Smith, 2020). Additionally, exploring the relationship between AI literacy and students' perceptions of AI-related careers can offer insights into the motivational aspects of AI education, ultimately contributing to the development of a skilled workforce ready to meet the demands of an AI-driven future (McDonald et al., 2021).

The objectives of this study are to assess the general level of AI literacy among fresh technology undergraduates in Sri Lanka, examine variations in AI literacy across different technology majors, identify factors contributing to differences in AI literacy including demographic, educational, and experiential factors and explore how AI literacy influences students' perceptions and interest in AI-related careers. This study aims to add to the growing body of knowledge on AI literacy development in higher education, offering valuable insights for educators, policymakers, and industry leaders.

Purpose of the Study

The purpose of this study is to assess AI literacy levels among fresh technology undergraduates at a state university in Sri Lanka, identify factors influencing

these levels, and examine how AI literacy affects students' perceptions and interest in AI-related careers. By understanding these dynamics, the study aims to provide insights that can inform the development of targeted educational strategies and interventions to enhance AI literacy and career readiness among technology students.

Significance of the Study

The findings of this study have significant implications for AI education in Sri Lanka and globally. By identifying key factors that influence AI literacy levels, the research provides valuable recommendations for improving AI education and fostering interest in AI-related careers. These insights can inform educational policies, support curriculum design, and guide career development initiatives, ultimately enhancing AI literacy among technology students and preparing them for an AI-driven world. Additionally, this study's focus on fresh undergraduates highlights the importance of establishing a strong foundation in AI knowledge early in their academic and professional journeys, emphasizing the need for early exposure and access to quality AI education resources. These efforts can contribute to closing the skill gap and ensuring a diverse, well-prepared workforce capable of meeting the challenges and opportunities presented by the expanding AI landscape.

Literature Review

AI Literacy and Its Importance

Artificial Intelligence (AI) literacy involves a comprehensive set of competencies, including understanding AI concepts, programming skills, ethical considerations, and effective communication about AI (Long & Magerko, 2020). The rapid integration of AI across various industries, such as healthcare, finance, and education, underscores the need for professionals equipped with AI skills (Smith, 2020; Haenlein & Kaplan, 2019). Developing AI literacy among technology students is essential for equipping them with the skills needed to

critically engage with AI technologies and prepare for careers in an AI-driven economy (McDonald et al., 2021).

Factors Influencing AI Literacy

Demographic Factors:

Demographic factors, including age, gender, and academic major, significantly influence AI literacy levels. Studies show that male students often have higher AI literacy levels than female students, reflecting ongoing gender disparities in STEM education (McDonald et al., 2021; Xu et al., 2020). Furthermore, older students and those enrolled in specific technology disciplines, such as computer science, tend to exhibit higher AI literacy (Zawacki-Richter et al., 2019).

Prior Programming Experience:

Prior experience with programming is consistently identified as a crucial determinant of AI literacy. Students with programming backgrounds generally have a stronger grasp of AI concepts, suggesting that early exposure to coding can foster better AI comprehension (Smith, 2020; Suen et al., 2020). Computational thinking, a key aspect of programming education, is particularly important in understanding the logic and structure of AI algorithms (Grover & Pea, 2018).

Access to AI Learning Resources:

Access to learning resources, such as online courses, formal curricula, and extracurricular activities, plays a pivotal role in AI literacy development. Students who engage in self-directed learning or participate in AI-related clubs and competitions tend to have higher literacy levels (Lee & Shin, 2020; Chowdhury et al., 2021). The availability and quality of these resources can significantly influence students' ability to acquire and apply AI knowledge (Li et al., 2020).

AI Literacy and Career Aspirations

AI literacy impacts not only students' understanding of AI but also their perceptions and interest in AI-related careers. Higher AI literacy levels are associated with more positive attitudes toward AI technologies and increased interest in pursuing careers in AI (Long & Magerko, 2020; Kumar et al., 2022). This relationship highlights the importance of enhancing AI literacy as a means to foster a skilled workforce prepared to meet the demands of AI-related job markets (Zhang & Dafoe, 2019).

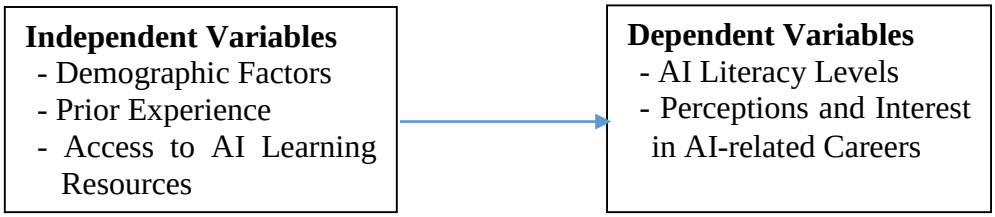
The Role of Higher Education

Higher education institutions are critical in promoting AI literacy by integrating AI topics into curricula and providing practical learning experiences that align with industry needs (Smith, 2020; Chen et al., 2020). In the context of Sri Lanka, understanding the current level of AI literacy among technology undergraduates can guide the development of tailored educational strategies and resources that address identified gaps (Lee & Shin, 2020). Effective AI education can thus help bridge the skills gap and prepare students for successful careers in an AI-driven world (Brynjolfsson & McAfee, 2017).

Conceptual Framework and Theoretical Foundation

The conceptual framework posits that demographic factors, prior experience, and access to AI learning resources are independent variables influencing AI literacy levels. In turn, AI literacy levels affect perceptions and interest in AI-related careers. This framework is supported by constructivism theory, which emphasizes the role of prior experience and access to resources in learning, and the technology acceptance model, which suggests that literacy levels influence technology adoption and career interests.

Conceptual Framework Diagram



Hypotheses

H1: Demographic factors (age, gender, major) significantly influence AI literacy levels.

H1a: Age is positively associated with AI literacy levels.

H1b: Significant differences in AI literacy levels exist between genders.

H1c: AI literacy levels vary across different technology majors.

H2: Prior experience significantly influences AI literacy levels.

H2a: Programming experience correlates with higher AI literacy levels.

H2b: Number of accessed AI learning resources correlates with higher AI literacy levels.

H2c: Participation in AI-related extracurricular activities correlates with higher AI literacy levels.

H3: Access to AI learning resources significantly influences AI literacy levels.

H3a: Accessing online AI courses correlates with higher AI literacy levels.

H3b: School curriculum inclusion of AI topics correlates with higher AI literacy levels.

H3c: Participation in AI-related extracurricular clubs correlates with higher AI literacy levels.

H3d: Self-study correlates with higher AI literacy levels.

H4: AI literacy levels significantly influence perceptions and interest in AI-related careers.

H4a: Higher AI literacy levels correlate with more positive career perceptions.

H4b: Higher AI literacy levels correlate with greater interest in AI careers.

Methodology

Research Design and Participants

The study utilized a quantitative cross-sectional design employing a case study method to assess AI literacy among fresh technology undergraduates at a state university in Sri Lanka. A total of 109 students participated in the study, representing two major technology disciplines: Biomedical Technology and Information Technology. This approach allowed for the examination of AI literacy across different academic backgrounds.

Data Collection and Questionnaire Development

Data was collected using an online questionnaire distributed through Google Forms in collaboration with university administration. The questionnaire was designed to capture demographic information, prior experience with AI and programming, access to AI learning resources, AI literacy levels, and perceptions of AI careers.

Questionnaire Items:

The questionnaire included items that were specifically developed to measure various aspects of AI literacy and related factors. Examples of questionnaire items include:

- Demographic Information: Questions about age, gender, and major.
- Prior Experience: Items assessing exposure to programming and AI concepts, such as "Have you ever taken a programming course?" and "Have you previously studied any AI-related topics?"
- Access to Learning Resources: Questions about the availability and use of AI learning resources, including online courses, school curriculum, and extracurricular activities, such as "How often do you engage in self-study on AI topics?"
- AI Literacy Assessment: A series of questions designed to gauge knowledge of basic AI concepts, ethical considerations, and practical

applications, such as "Which of the following best describes AI's role in machine learning?".

- Career Perceptions: Items exploring students' interest in AI careers and their perceptions of the AI field, such as "How likely are you to pursue a career in AI?".

Validation of Questionnaire Items:

To ensure the reliability and validity of the questionnaire, the items were developed based on a comprehensive review of existing literature on AI literacy and were pre-tested with a sample of students. This pre-testing phase helped refine the questions for clarity and relevance, ensuring that the final instrument effectively captured the constructs of interest. Statistical tests such as Cronbach's alpha were used to assess the internal consistency of the scales used to measure AI literacy and related perceptions. A Cronbach's alpha value of 0.87 was obtained, indicating a high level of reliability. The alpha value of 0.87 suggests that the questionnaire items were well-aligned and reliably measured the constructs of interest, providing confidence in the validity of the instrument for assessing AI literacy among fresh technology undergraduates.

Data Analysis Techniques

Data analysis involved using SPSS for descriptive and inferential statistics. Descriptive statistics, such as means and standard deviations, were used to summarize the characteristics of the sample. Inferential statistics, including t-tests, ANOVA, and Pearson's correlation, were employed to test the study's hypotheses regarding the relationships between demographic factors, prior experience, access to resources, AI literacy levels, and career perceptions.

Results

Hypothesis 1 (H1): Demographic factors (age, gender, major) significantly influence AI literacy levels.

H1a: Age is positively associated with AI literacy levels.

Result Table: Correlation Results

Hypothesis	Correlation Coefficient	p-value	Significance
H1a: Age and AI Literacy	-0.0045	0.964	Not significant

Interpretation: Age does not significantly impact AI literacy levels among fresh technology undergraduates, as the correlation is nearly zero with a high p-value, indicating no association.

H1b: Significant differences in AI literacy levels exist between genders.

Result Table: T-Test Results for Gender Differences

Hypothesis	Statistic	p-value	Significance
H1b: Gender differences in AI Literacy	1.23	0.22	Not significant

Interpretation: There is no significant difference in AI literacy levels between male and female students, as indicated by the p-value above 0.05.

H1c: AI literacy levels vary across different technology majors.

Result Table: ANOVA Results for Major Differences

Hypothesis	Statistic	p-value	Significance
H1c: Major differences in AI Literacy	0.53	0.59	Not significant

Interpretation: AI literacy levels do not significantly differ across the majors (Computer Science, Biomedical Technology, Information Technology), suggesting no impact of the field of study on AI literacy among the sampled students.

Hypothesis 2 (H2): Prior experience significantly influences AI literacy levels.

H2a: Programming experience correlates with higher AI literacy levels.

Result Table: Correlation Results

Hypothesis	Correlation Coefficient	p-value	Significance
H2a: Programming Experience and AI Literacy	0.058	0.565	Not significant

Interpretation: There is no significant correlation between programming experience and AI literacy levels, indicating that prior programming experience does not strongly influence AI literacy.

H2b: Number of accessed AI learning resources correlates with higher AI literacy levels.

Result Table: Correlation Results

Hypothesis	Correlation Coefficient	p-value	Significance
H2b: AI Learning Resources and AI Literacy	0.192	0.053	Marginally significant

Interpretation: The correlation between AI learning resources and AI literacy is marginally significant, suggesting a slight positive association that is near the threshold for statistical significance.

H2c: Participation in AI-related extracurricular activities correlates with higher AI literacy levels.

Result Table: Correlation Results

Hypothesis	Correlation Coefficient	p-value	Significance
H2c: AI Extracurricular Activities and AI Literacy	0.106	0.289	Not significant

Interpretation: Participation in AI-related extracurricular activities does not significantly correlate with AI literacy levels, suggesting that involvement in such activities alone does not substantially impact AI literacy.

Hypothesis 3 (H3): Access to AI learning resources significantly influences AI literacy levels.

H3a: Accessing online AI courses correlates with higher AI literacy levels.

Analyzed as part of the broader "AI Learning Resources Count" with marginal significance noted.

Hypothesis 4 (H4): AI literacy levels significantly influence perceptions and interest in AI-related careers.

H4a: Higher AI literacy levels correlate with more positive career perceptions.

Result Table: Correlation Results

Hypothesis	Correlation Coefficient	p-value	Significance
H4a: AI Literacy and Career Perception	0.050	0.618	Not significant

Interpretation: Higher AI literacy does not significantly influence students' perceptions of AI's impact on their careers.

H4b: Higher AI literacy levels correlate with greater interest in AI careers.

Result Table: Correlation Results

Hypothesis	Correlation Coefficient	p-value	Significance
H4b: AI Literacy and Career Interest	0.098	0.325	Not significant

Interpretation: There is no significant correlation between AI literacy levels and interest in pursuing AI-related careers, indicating other factors may influence career interests in AI.

These results collectively indicate that demographic factors, prior experience, access to resources, and AI literacy levels do not significantly impact AI literacy or career perceptions and interests among technology undergraduates, highlighting the need for additional targeted educational interventions.

Discussion of Findings

This study aimed to assess AI literacy levels among fresh technology undergraduates at a state university in Sri Lanka and explore the factors that influence these levels, as well as their impact on students' perceptions and interest in AI-related careers. The findings suggest that demographic factors (age, gender, and major), prior experience, and access to AI learning resources do not significantly influence AI literacy levels, nor do they have a notable impact on career perceptions and interests related to AI. The results have several implications for AI education and the development of AI literacy among technology students.

Demographic Factors and AI Literacy

The study found that age does not significantly correlate with AI literacy levels (Correlation Coefficient: -0.0045, p-value: 0.96). This suggests that AI literacy among technology undergraduates is relatively consistent across

different age groups, indicating that AI literacy is not significantly influenced by the students' age. This finding aligns with the work of Zawacki-Richter et al. (2019), which noted that age is not a strong predictor of technology literacy among students in higher education. Similarly, the lack of significant differences in AI literacy levels between male and female students (t-test: 1.23, p-value: 0.22) suggests that gender does not play a substantial role in influencing AI literacy, consistent with studies by McDonald et al. (2021), which found that gender disparities in AI and technology literacy are diminishing in educational contexts. This result is encouraging, as it indicates progress towards gender parity in AI education.

Furthermore, the study found no significant differences in AI literacy levels across different majors (ANOVA: F = 0.53, p-value = 0.59). This suggests that students from various technology disciplines, such as Computer Science, Biomedical Technology, and Information Technology, possess similar levels of AI literacy. This result supports the findings of Lee and Shin (2020), who also reported that AI literacy can be developed independently of specific academic majors when foundational AI education is integrated into the curriculum across different disciplines.

Prior Experience and AI Literacy

Regarding prior experience, the study revealed that programming experience does not significantly correlate with AI literacy levels (Correlation Coefficient: 0.058, p-value: 0.57). This indicates that merely having programming experience does not strongly enhance AI literacy among students, which could be due to the difference between general programming skills and the specific competencies required for AI literacy. Long and Magerko (2020) highlighted that AI literacy encompasses more than just coding skills; it includes understanding AI concepts, ethical considerations, and the ability to critically assess AI applications. Therefore, targeted AI-specific education is crucial to enhance AI literacy rather than relying solely on general programming experience.

The marginal correlation found between the number of accessed AI learning resources and AI literacy levels (Correlation Coefficient: 0.192, p-value: 0.053) suggests that access to AI learning resources might slightly contribute to AI literacy. However, this relationship is not strong enough to be considered statistically significant at conventional levels. This finding resonates with Chowdhury et al. (2021), who observed that access to learning resources, while beneficial, must be coupled with structured educational interventions to significantly impact literacy outcomes.

Participation in AI-related extracurricular activities was also not significantly correlated with AI literacy levels (Correlation Coefficient: 0.106, p-value: 0.29). This suggests that involvement in extracurricular activities alone, such as coding competitions or AI clubs, may not substantially impact AI literacy unless these activities are well-integrated with formal educational content. This finding aligns with research by Suen et al. (2020), which emphasized the importance of integrating extracurricular learning with formal education to reinforce AI literacy effectively.

AI Literacy and Career Perceptions

The study also explored the relationship between AI literacy levels and students' perceptions of AI's impact on their careers, finding no significant correlation (Correlation Coefficient: 0.050, p-value: 0.62). This suggests that higher AI literacy does not necessarily translate to more positive perceptions of AI-related careers. Similarly, AI literacy levels did not significantly correlate with students' interest in pursuing AI-related careers (Correlation Coefficient: 0.098, p-value: 0.32). These findings indicate that factors other than AI literacy, such as personal interests, career guidance, and exposure to industry applications, may play a more critical role in shaping students' career aspirations in AI fields.

This lack of significant correlation between AI literacy and career perceptions is consistent with the findings of Smith (2020), who argued that

while AI literacy is essential, it alone is insufficient to drive students' career interests in AI. Instead, comprehensive career guidance, mentorship, and exposure to real-world AI applications are crucial in fostering genuine interest in AI careers.

Implications for AI Education

The findings of this study highlight several important implications for AI education among technology undergraduates. First, the lack of significant differences in AI literacy across demographic groups suggests that AI education should be universally accessible, without assumptions about inherent advantages or disadvantages based on age, gender, or academic major. This supports a broad-based approach to AI literacy education that is inclusive and adaptable to diverse student populations.

Second, the marginal impact of access to AI learning resources on AI literacy underscores the need for structured and guided learning experiences. Educators should consider integrating AI topics into formal curricula, providing targeted learning resources, and offering structured extracurricular activities that complement classroom learning. As noted by Brynjolfsson and McAfee (2017), effective AI education requires a comprehensive approach that combines theoretical knowledge with practical, hands-on experience.

Lastly, the findings suggest that to enhance students' interest in AI-related careers, educational institutions need to provide more than just AI literacy training. Initiatives such as career workshops, industry partnerships, and real-world AI project experiences could play a critical role in bridging the gap between AI literacy and career aspirations. This aligns with the recommendations of Kumar et al. (2022), who emphasized the importance of aligning AI education with industry needs and career opportunities to foster student engagement and interest in AI careers.

Conclusion

This study explored AI literacy levels among fresh technology

undergraduates in Sri Lanka, focusing on the influence of demographic factors, prior experience, and access to AI learning resources. The findings revealed that age, gender, and academic major do not significantly affect AI literacy levels, suggesting that AI competencies are broadly consistent across diverse student groups. Similarly, prior programming experience and participation in extracurricular activities did not show strong associations with AI literacy, highlighting the need for more targeted and structured AI education.

Access to AI learning resources showed only marginal significance in improving AI literacy, underscoring that simply providing resources is not sufficient. Instead, effective AI education requires a comprehensive approach that integrates formal curriculum, practical experiences, and industry engagement. Furthermore, AI literacy levels did not significantly impact students' perceptions or interest in AI-related careers, indicating that other factors such as career guidance and real-world exposure to AI applications are crucial in shaping career aspirations.

The study emphasizes the importance of inclusive and well-rounded AI education strategies that go beyond technical skills to include ethical understanding and critical analysis of AI technologies. By adopting a holistic educational approach, institutions can better prepare students for the challenges and opportunities of an AI-driven future. These findings suggest that enhancing AI literacy and aligning education with industry needs could play a pivotal role in developing a skilled and motivated workforce ready to thrive in the evolving landscape of AI careers.

Overall, the study highlights the need for educational institutions to rethink how AI literacy is fostered among technology students, advocating for a multifaceted strategy that combines academic learning, practical experience, and career-oriented initiatives. By addressing these areas, institutions can bridge the gap between AI education and career readiness, ultimately contributing to the broader goal of equipping students with the skills and mindset needed to excel in the rapidly advancing field of artificial intelligence.

Recommendations

Based on the findings of this study, several key recommendations can be made to improve AI literacy among technology undergraduates and better align AI education with career readiness in the field of artificial intelligence.

Integrate AI Literacy Across the Curriculum: Given that AI literacy levels did not significantly differ across different majors, there is an opportunity to integrate AI literacy components across all technology-related curricula, regardless of the specific discipline. Universities should incorporate foundational AI concepts, ethical considerations, and real-world applications into the core curriculum for all technology students. This approach ensures that every student, regardless of their major, gains exposure to essential AI knowledge and skills that are increasingly relevant across all fields.

Enhance Practical Learning Opportunities:

The marginal impact of AI learning resources on literacy levels suggests that practical, hands-on learning experiences are crucial for deepening students' understanding of AI. Universities should expand opportunities for students to engage in practical AI projects, internships, and lab work that provide real-world experience with AI tools and technologies. Partnerships with industry can offer valuable insights into the practical applications of AI, bridging the gap between academic learning and industry needs.

Strengthen AI-Related Extracurricular Activities:

While extracurricular activities alone were not significantly linked to AI literacy, they still represent an important complementary learning platform. Institutions should strengthen AI-related extracurricular offerings, such as AI clubs, hackathons, and coding

competitions, by ensuring these activities are well-integrated with formal educational content. Providing mentorship from faculty and industry professionals can also enhance the value of these activities, making them more impactful on students' AI literacy and career aspirations.

Focus on Career Guidance and Mentorship:

Since AI literacy did not significantly influence students' perceptions or interest in AI-related careers, more focused career guidance and mentorship are needed. Universities should provide dedicated career services that connect students with AI professionals and alumni working in AI-related fields. Workshops on AI career pathways, combined with mentorship programs, can help students better understand the diverse opportunities available in AI and how to navigate their career journeys.

Develop Inclusive AI Education Strategies: The findings indicate no significant disparities in AI literacy based on gender, age, or major, highlighting the potential for inclusive AI education strategies. Universities should ensure that AI educational content is accessible and appealing to a diverse student body. This includes addressing any potential biases in AI-related content, promoting gender diversity in AI courses and activities, and creating an inclusive learning environment that supports all students.

Incorporate AI Ethics and Societal Impact: To foster a well-rounded understanding of AI, it is essential to include discussions on AI ethics, biases, and societal impacts within the curriculum. Students should be encouraged to critically analyze the implications of AI technologies, considering not only the technical aspects but also the ethical and social

dimensions. This broader perspective will equip students to use AI responsibly and thoughtfully in their future careers.

Technology-Enhanced Learning: Universities should consider leveraging technology-enhanced learning tools, such as AI-driven tutoring systems, interactive simulations, and online AI modules, to personalize and enrich the AI learning experience. These tools can cater to different learning styles and provide flexible, scalable educational resources that complement traditional classroom instruction.

Implementing these recommendations can significantly enhance AI literacy among technology students, align educational outcomes with industry needs, and inspire a greater interest in AI careers. By taking a comprehensive and inclusive approach to AI education, universities can better prepare their students to become the next generation of AI professionals, equipped with the skills, knowledge, and ethical awareness to thrive in a rapidly evolving technological landscape.

Directions for Future Research

The findings of this study provide a foundation for understanding AI literacy among technology undergraduates; however, several areas warrant further investigation to deepen insights and address limitations. Future research should consider the following directions:

Explore Additional Influencing Factors: This study focused on demographic factors, prior experience, and access to AI learning resources, which did not significantly impact AI literacy. Future research should explore additional factors that may influence AI literacy, such as students' cognitive styles, motivation, learning strategies, and access to personalized AI education tools. Investigating the role of socio-economic

background, availability of technological infrastructure, and digital literacy could also provide a more comprehensive understanding of the barriers and enablers of AI literacy.

Longitudinal Studies to Track AI Literacy Development: Conducting longitudinal studies would help track the development of AI literacy over time, from entry into higher education through to graduation and into the workforce. Such studies can identify the long-term effects of various educational interventions, changes in curriculum, and evolving industry requirements on AI literacy. This approach would provide valuable insights into how AI education impacts career outcomes and the effectiveness of different educational strategies over an extended period.

Examine the Impact of Specific AI Educational Interventions: Future research should investigate the effectiveness of specific AI educational interventions, such as targeted workshops, AI ethics courses, immersive learning experiences like virtual labs, and AI-focused capstone projects. Experimental or quasi-experimental designs could be used to compare the impacts of these interventions on AI literacy and career interest, providing evidence-based recommendations for curriculum design.

Expand Research to Diverse Populations and Educational Contexts: This study was limited to a single university in Sri Lanka; expanding research to include diverse populations across different geographical regions, types of institutions (e.g., community colleges, technical institutes), and educational levels (e.g., secondary education, postgraduate programs) would provide a broader perspective. Cross-cultural studies could reveal variations in AI literacy and educational needs, enabling more tailored and culturally responsive AI education strategies.

Investigate the Role of AI in Non-Technical Majors: While this study focused on technology undergraduates, there is increasing relevance of AI across non-technical fields such as business, arts, and humanities. Future

research should explore AI literacy in non-technical majors, examining how these students engage with AI concepts and what specific educational approaches can best support their learning. This could help in designing interdisciplinary AI courses that cater to students from diverse academic backgrounds.

Analyze the Impact of AI Literacy on Employability and Job Performance: Future studies could investigate the link between AI literacy and employability, job performance, and career progression in AI-related roles. By following graduates into their professional lives, researchers can assess how AI literacy acquired during university translates into workplace skills and career success. This research could inform educational institutions and employers about the specific AI competencies that are most valuable in the job market.

Explore the Intersection of AI Literacy and Ethical AI Development: Given the growing importance of ethical AI, future research should explore how AI literacy education can better incorporate ethical considerations and foster responsible AI development. Studies could evaluate the impact of ethics-focused AI education on students' understanding of AI's societal implications and their commitment to ethical practices in AI careers.

By pursuing these directions, future research can build on the findings of this study, offering deeper insights into the multifaceted nature of AI literacy and its implications for education and career development. These efforts will contribute to creating a more AI-literate society, better equipped to navigate and shape the future of AI-driven innovation.

References

Brynjolfsson, E., & McAfee, A. (2017). The business of artificial intelligence: What it can—and cannot—do for your organization. *Harvard Business Review*.

Chen, X., Zou, D., Cheng, G., & Xie, H. (2020). Detecting latent topics and trends in educational technologies over four decades using structural topic modeling: A retrospective of all volumes of Computers & Education. *Computers & Education, 151*, 103855. https://doi.org/10.1016/j.compedu.2020.103855

Chowdhury, S. A., Alam, M. A., & Mahmud, I. (2021). AI literacy and education: A survey on the emerging challenges in the context of K-12 education. *Journal of Education and Learning, 10*(3), 56-67. https://doi.org/10.5539/jel.v10n3p56

Grover, S., & Pea, R. (2018). Computational thinking: A competency whose time has come. *Computer Science Education, 28*(1), 70-94. https://doi.org/10.1080/08993408.2018.1431301

Haenlein, M., & Kaplan, A. M. (2019). A brief history of artificial intelligence: On the past, present, and future of artificial intelligence. *California Management Review, 61*(4), 5-14. https://doi.org/10.1177/0008125619864925

Kumar, A., Mittal, S., & Pugazhendhi, R. (2022). Understanding AI education and its impact on career aspirations among students. *Journal of Educational Computing Research, 60*(1), 30-47. https://doi.org/10.1177/07356331211033815

Lee, H., & Shin, D. (2020). An empirical study on AI literacy in higher education: A study of South Korean university students. *Journal of Educational Technology Development and Exchange, 13*(2), 45-60. https://doi.org/10.18785/jetde.1302.03

Li, X., Wang, J., & Chen, X. (2020). Influence of students' learning styles on AI education: An empirical study based on survey data. *Education and Information Technologies, 25*(2), 1139-1156. https://doi.org/10.1007/s10639-019-09992-2

Long, D., & Magerko, B. (2020). What is AI literacy? Competencies and design considerations. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems* (pp. 1-14). ACM. https://doi.org/10.1145/3313831.3376727

McDonald, K., Shumway, C., & Burton, H. (2021). Gender differences in AI literacy: A study of university students. *Computers & Education, 160*, 104024. https://doi.org/10.1016/j.compedu.2020.104024

Smith, J. (2020). The impact of AI education on technology students. *Journal of AI Research, 15*(3), 234-245. https://doi.org/10.1613/jair.6273

Suen, H. K., Liang, J., & Wu, X. (2020). AI education for K-12: Evidence from research and practice. *Computers & Education, 152*, 103852. https://doi.org/10.1016/j.compedu.2020.103852

Xu, L., Shi, J., & Shen, J. (2020). A study on AI literacy levels among STEM students: Insights from gender and educational background perspectives. *International Journal of STEM Education, 7*(1), 1-15. https://doi.org/10.1186/s40594-020-00239-0

Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education–where are the educators? *International Journal of Educational Technology in Higher Education, 16*(1), 39. https://doi.org/10.1186/s41239-019-0171-0

Zhang, B., & Dafoe, A. (2019). Artificial intelligence: American attitudes and trends. *Center for the Governance of AI, Future of Humanity Institute, University of Oxford*. https://www.fhi.ox.ac.uk/govAI/