International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Artificial Intelligence Literacy among Prospective Teachers

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Abstract
Artificial Intelligence (AI) is increasingly influencing the field of education by supporting teaching, learning, assessment and educational decision-making. Therefore, developing AI literacy among prospective teachers is essential for preparing them to use AI technologies effectively and responsibly in their future teaching careers. The present study aims to examine the level of AI literacy among prospective teachers and to find out whether significant differences exist based on gender, locality, type of institutional management and age group. The study adopted the descriptive survey method. A sample of 300 prospective teachers was selected from government, government-aided and self-financing teacher education institutions through stratified random sampling. Data were collected using an Artificial Intelligence Literacy Scale and a Personal Data Sheet. The collected data were analysed using descriptive statistics, independent samples t-tests and one-way analysis of variance (ANOVA). The reported findings revealed that there was no significant difference in AI literacy based on gender, locality and institutional management. However, a significant difference was reported among prospective teachers belonging to different age groups. The study highlights the importance of strengthening AI literacy through appropriate training, practical exposure and ethical awareness in teacher education programmes. It is recommended that teacher education institutions provide opportunities for prospective teachers to develop the knowledge and skills required for the effective and responsible use of AI in education.

Keywords: Artificial Intelligence Literacy, Prospective Teachers, Teacher Education, AI Competency, Educational Technology.

1. Introduction

Artificial Intelligence has emerged as one of the most influential technologies in the modern world. It is transforming various fields, including education, healthcare, communication, business and scientific research. In education, AI provides new opportunities to improve teaching and learning through intelligent tutoring systems, personalized learning platforms, automated assessment and AI-supported educational resources. The integration of Artificial Intelligence into education has changed the responsibilities and expectations of teachers. Teachers are now expected not only to possess subject knowledge and pedagogical skills but also to understand and use emerging technologies effectively. In this context, Artificial Intelligence Literacy has become an essential competency for future teachers. AI literacy refers to an individual's ability to understand the basic concepts of Artificial Intelligence, recognize its

applications, interact with AI-based tools and evaluate their benefits and limitations. It also involves understanding ethical issues such as data privacy, fairness, transparency and responsible use of AI technologies. Prospective teachers are the future contributors to the educational system. Their understanding of Artificial Intelligence may influence how effectively they integrate technology into classroom teaching. Therefore, teacher education institutions have an important responsibility to develop AI awareness, knowledge and practical competencies among prospective teachers. However, prospective teachers may differ in their exposure to digital technologies and their opportunities to learn about Artificial Intelligence. Factors such as gender, locality, institutional management and age may be associated with differences in AI literacy. Hence, the present study has been undertaken to examine Artificial Intelligence Literacy among prospective teachers.

2. Need of the study

The rapid development of Artificial Intelligence has created new possibilities for improving the quality of education. AI-based applications are increasingly being used for lesson preparation, teaching materials, student assessment and personalised learning. Consequently, teachers need appropriate knowledge and skills to use these technologies responsibly. Prospective teachers must be prepared to face the technological challenges of the modern classroom. However, their level of understanding of Artificial Intelligence may vary according to their educational background, exposure to technology and learning opportunities. Understanding the AI literacy of prospective teachers is important for identifying their preparedness to work in technology-supported educational environments. It may also help teacher education institutions identify areas where additional training and professional development are required. The present study therefore focuses on Artificial Intelligence Literacy among prospective teachers. It examines differences based on gender, locality, type of institutional management and age group. The findings may provide useful information for improving teacher education programmes and promoting responsible AI integration in education.

3. Review of Related Literature

Long and Magerko (2020) conducted a study entitled What is AI Literacy? Competencies and Design Considerations. The study explained the important competencies required for individuals to understand and interact with Artificial Intelligence. The authors highlighted the ability to recognise AI technologies, understand their working principles, critically evaluate their applications and use them appropriately. Their work provides a conceptual foundation for understanding AI literacy and its importance in everyday life and educational settings.

Davy.Tsz.Kit Ng., Leung, J. K. L., Chu, S. K. W., & Qiao, M. S. (2021) examined the concept of AI literacy through an exploratory review. The authors discussed the different dimensions of AI literacy and explained that it involves understanding, using, evaluating and applying Artificial Intelligence. They emphasised that AI literacy should not be restricted to technical knowledge but should also include critical thinking and ethical awareness. The study provides a useful framework for understanding the different competencies required for effective AI use.

Akgun and Greenhow (2022) examined the societal and ethical challenges associated with the use of Artificial Intelligence in education. Their study highlighted concerns related to privacy, fairness, transparency and the responsible use of AI technologies. The authors emphasised the need to develop

awareness of the ethical implications of AI among teachers and students. This study indicates that AI literacy should include ethical understanding along with technological knowledge.

Ayanwale et al. (2022) investigated teachers' readiness and intention to teach Artificial Intelligence in schools. Their study focused on the importance of preparing teachers to introduce AI-related concepts into educational practices. The findings highlighted the relevance of teachers' readiness, confidence and understanding in supporting AI education. The study suggests that teacher education programmes should provide appropriate opportunities for developing AI-related competencies.

4. Objectives

- To find out whether there is any significant difference in Artificial Intelligence Literacy among prospective teachers with respect to gender.
- To find out whether there is any significant difference in Artificial Intelligence Literacy among prospective teachers with respect to locality.
- To find out whether there is any significant difference in Artificial Intelligence Literacy among prospective teachers with respect to type of institutional management.
- To find out whether there is any significant difference in Artificial Intelligence Literacy among prospective teachers with respect to age group.

5. Hypotheses of the study

- There is no significant difference between (Gender) male and female prospective teachers with respect to their Artificial Intelligence Literacy.
- There is no significant difference between (locality) rural and urban prospective teachers with respect to their Artificial Intelligence Literacy.
- There is no significant difference between (Type of management) government / government-aided / private prospective teachers with respect to their Artificial Intelligence Literacy.
- There is no significant difference between prospective teachers belonging to different (Age group) below 30 Years, 31-40 Years, 41-50 Years and above 51 Years with respect to their Artificial Intelligence Literacy.

6. Methodology

The investigator adopted the descriptive survey method of study and selected the stratified random sampling technique. 300 prospective teachers were randomly selected from various colleges belongs to government, government-aided and self-financed management. Artificial Intelligence Literacy Scale (2022) developed by Wang, B., Rau, P. L. P., & Yuan, T. A Personal Data Sheet was also created by the investigator. The formulated hypotheses and objectives were tested using appropriate statistical technique t-test and F-Test Analysis of Variance (ANOVA).

7. Testing of Hypothesis:

Hypothesis – 1

There is no significant difference between (Gender) male and female prospective teachers with respect to their Artificial Intelligence Literacy.

Table 1					
Details of t-Test Result for Gender					
Gender	**N**	**Mean**	**SD**	**t-Value**	**LOS**
Male	13	125.38	17.64	0.245	Not Significant
Female	287	125.84	13.86		

***LOS- Level of Significance.**

As shown in the Table 1, the mean score for Male (N= 13) is 125.38 with SD of 17.64 and the mean score for Female (N = 287) is 125.84 with SD of 13.86. The calculated t-value (0.245) is less than the table value (1.96) at 0.05 level of significance. It is inferred from these results (t = 0.245 < 1.96), there is no significant difference between male and female prospective teachers on Artificial Intelligence Literacy. It can be concluded that null hypothesis 1 is accepted.

Hypothesis – 2

There is no significant difference between (locality) rural and urban prospective teachers with respect to their Artificial Intelligence Literacy

Table 2					
Details of t-Test Result for Locality					
Locality	**N**	**Mean**	**SD**	**t-Value**	**LOS**
Rural	13	102.57	15.18	0.215	Not Significant
Urban	287	109.36	9.17		

***LOS- Level of Significance.**

As shown in the Table 2, the mean score for Rural (N= 13) is 102.57 with SD of 15.18 and the mean score for Urban (N = 287) is 109.36 with SD of 9.17. The calculated t-value (0.215) is less than the table value (1.96) at 0.05 level of significance. It is inferred from these results (t = 0.215< 1.96), there is no significant difference between rural and urban prospective teachers on Artificial Intelligence Literacy. It can be concluded that null hypothesis 2 is accepted.

Hypothesis – 3

There is no significant difference between type of management (government / government-aided / private) prospective teachers with respect to their Artificial Intelligence Literacy

Table 3						
Details of F-ratio Result for Type of Management						
Variables	**Source**	**Sum of Squares**	**Df**	**Mean Square**	**F-value**	**LOS**
Professional Development Needs for Artificial Intelligence Integration in Education	Between Groups	1275.2	2	425.06	3.30	Not Significant
	Within Groups	57410	297	193.95		

	Total	58685.64	299			

***LOS- Level of Significance.**

As shown in Table 3, the obtained value for F is 3.30; it is less than the table value 3.84 at 0.05 level of significant. There is no significant different on Artificial Intelligence Literacy of prospective teachers based on their type of management (government / government-aided / private). It can be concluded that null hypothesis 3 is accepted.

Hypothesis – 4

There is no significant difference between prospective teachers belonging to different age group (below 30 Years, 31-40 Years, 41-50 Years and above 51 Years) with respect to their Artificial Intelligence Literacy.

Table 4

Details of F-ratio Result for Age Group

Variables	Source	Sum of Squares	Df	Mean Square	F-value	LOS
Professional Development Needs for Artificial Intelligence Integration in Education	Between Groups	3469.93	3	1156.643	6.201	Significant
	Within Groups	55216.71	296	186.54		
	Total	58685.64	299			

***LOS- Level of Significance.**

As shown in Table 4, the obtained value for F is 6.201; it is greater than the table value 3.84 at 0.05 level of significant. There is significant different on Artificial Intelligence Literacy of prospective teachers based on their age group (below 30-Years, 31-40 Years, 41-50 Years and above 51 Years). It can be concluded that null hypothesis 4 is rejected.

8. Major findings of the study

Based on the statistical results provided in the present study, the following major findings are reported:

- There is no significant difference in Artificial Intelligence Literacy between male and female prospective teachers.
- There is no significant difference in Artificial Intelligence Literacy between rural and urban prospective teachers, according to the reported t-test result.
- There is no significant difference in Artificial Intelligence Literacy among prospective teachers studying in government, government-aided and private teacher education institutions, according to the reported ANOVA result.
- There is a significant difference in Artificial Intelligence Literacy among prospective teachers belonging to different age groups, according to the reported ANOVA result.

9. Discussion of the results

The findings revealed that there was no significant difference in AI literacy between male and female prospective teachers. This indicates that gender did not appear to influence their AI literacy levels. Both

male and female prospective teachers may have similar opportunities to access and use AI-based educational technologies. Therefore, AI literacy development should be encouraged equally among all prospective teachers, irrespective of gender. The study also revealed no significant difference in AI literacy between rural and urban prospective teachers, according to the reported statistical result. This suggests that locality may not have a significant influence on AI literacy among the participants. However, teacher education institutions should continue to provide equal access to digital resources, AI tools and practical training for both rural and urban students. The findings further indicated no significant difference in AI literacy among prospective teachers studying in government, government-aided and private institutions. This suggests that the type of institutional management may not have a significant influence on AI literacy. All teacher education institutions should therefore provide appropriate opportunities for developing AI-related knowledge, skills and competencies.

However, the study revealed a significant difference in AI literacy among prospective teachers belonging to different age groups. This indicates that age may be associated with variations in AI literacy. Differences in technology exposure, digital experience and opportunities to use AI tools may contribute to these variations. Therefore, teacher education programmes should provide suitable AI training to meet the learning needs of prospective teachers from different age groups. Overall, the findings highlight the importance of developing AI literacy among prospective teachers. Teacher education institutions should integrate AI-related knowledge, practical activities and ethical awareness into their programmes to prepare future teachers for technology-supported teaching and learning.

10. Educational Implications

The findings of the present study have several implications for teacher education institutions, teacher educators and prospective teachers.

- Strengthening AI Awareness: Teacher education institutions should organise awareness programmes to introduce prospective teachers to the basic concepts, applications and importance of Artificial Intelligence in education.
- Integrating AI into Teacher Education: AI-related topics may be included in teacher education curricula to help prospective teachers understand how emerging technologies can support classroom teaching and learning.
- Providing Practical Training: Workshops, demonstrations and hands-on training sessions should be organised to familiarise prospective teachers with AI-based educational applications.
- Promoting Responsible AI Use: Prospective teachers should be made aware of ethical concerns related to AI, including data privacy, plagiarism, bias, misinformation and responsible use of AI-generated content.
- Developing Digital Competencies: Teacher education institutions should provide opportunities for prospective teachers to develop technological knowledge, critical thinking and digital problem-solving skills.
- Supporting Different Age Groups: Appropriate learning opportunities and training programmes should be provided to prospective teachers according to their learning needs and levels of technological exposure.
- Encouraging Continuous Learning: Prospective teachers should be encouraged to update their knowledge and skills regularly to keep pace with developments in Artificial Intelligence.

11. Conclusion

Artificial Intelligence is gradually becoming an important part of the educational environment. Therefore, developing AI literacy among prospective teachers is essential for preparing them to meet the demands of modern education. The study highlights the importance of providing appropriate AI-related learning opportunities in teacher education institutions. AI literacy should not be limited to the ability to operate AI applications. It should also include understanding AI concepts, evaluating AI-generated information, recognising limitations and using AI responsibly. Therefore, teacher education programmes should give greater attention to developing AI literacy among prospective teachers to prepare them for the changing educational environment.

12. References

1. Ayanwale, M. A., Adelana et al., (2024). Examining artificial intelligence literacy among pre-service teachers for future classrooms. *Computers and Education Open*, 6, Article 100179. https://doi.org/10.1016/j.caeo.2024.100179.
2. Wang, B., Rau, P. L. P., & Yuan, T. (2023). Measuring user competence in using artificial intelligence: Validity and reliability of artificial intelligence literacy scale. *Journal of Behaviour & Information Technology*. 42 (9) DOI : https://doi.org/10.1080/0144929X.2022.2072768.
3. Akgun, S., & Greenhow, C. (2022). Artificial intelligence (AI) in education: Addressing societal and ethical challenges in K-12 settings. AI and Ethics, 2, 431–440. https://doi.org/10.1007/s43681-021-00096-7.
4. Ayanwale, M. A., Sanusi, I. T., Adelana et al., (2022). Teachers' readiness and intention to teach artificial intelligence in schools. *Computers and Education: Artificial Intelligence*, 3, Article 100099. https://doi.org/10.1016/j.caeai.2022.100099.
5. Chiu, K. F., Ahmad, Z., Ismailov, M., & Sanusi, I. T. (2024). What are artificial intelligence literacy and competency? A comprehensive framework to support them. *Computers and Education Open*, 6, Article 100171. https://doi.org/10.1016/j.caeo.2024.100171.
6. Long, D., & Magerko, B. (2020). What is AI literacy? Competencies and design considerations. Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems, *Computers and Education Open* Article number: 100171
7. DOI: https://doi.org/10.1016/j.caeo.2024.100171.
8. Davy.Tsz.Kit Ng., Leung, J. K. L., Chu, S. K. W., & Qiao, M. S. (2021). Conceptualizing AI literacy: An exploratory review. *Computers and Education: Artificial Intelligence*, 2, Article 100041. https://doi.org/10.1016/j.caeai.2021.100041.
9. Sperling, K., Stenberg, C.-J., McGrath et al., (2024). In search of artificial intelligence (AI) literacy in teacher education: A scoping review. *Computers and Education Open*, 6, Article 100169. https://doi.org/10.1016/j.caeo.2024.100169.
10. Hsu, H.-P. (2026). Artificial intelligence literacy and competency in pre-service teacher education. *Encyclopaedia*, 6(4), Article 76. https://doi.org/10.3390/encyclopedia6040076.