

Article

Artificial Intelligence Literacy and Classroom Use Among Sri Lankan School Teachers

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Abstract:

Artificial intelligence (AI) is increasingly being used in school education. However, there is limited evidence on the level of AI literacy among Sri Lankan school teachers and how their AI literacy is related to the pedagogical use of AI. This study examined teachers' awareness and use of AI tools, their AI literacy across six dimensions, their pedagogical use of AI, differences according to selected demographic characteristics, and the relationship between AI literacy and pedagogical use. A cross-sectional online survey was conducted with 410 practising teachers from all 25 administrative districts of Sri Lanka, recruited through non-probability convenience and snowball sampling. Data were analysed using descriptive statistics, independent-samples t-tests, one-way analysis of variance, and Pearson correlation analysis. The findings revealed that ChatGPT and Gemini were the most widely used AI tools, while the use of specialised educational, research-oriented, and subject-specific AI tools was relatively low. Teachers reported above-midpoint scores across all six dimensions of AI literacy. Societal Awareness recorded the highest mean score ($M = 3.87$, $SD = 1.02$), while Critical Evaluation recorded the lowest ($M = 3.49$, $SD = 0.99$). In relation to pedagogical use, Pedagogical Application ($M = 3.33$, $SD = 1.09$) was slightly higher than Frequency of Use ($M = 3.18$, $SD = 1.04$), suggesting that teachers were using AI for particular teaching purposes. However, it had not yet become a regular part of their teaching practice. Differences were found in some dimensions of AI literacy according to gender, age, and teaching experience, while medium of instruction and school location showed only limited differences. All six dimensions of AI literacy were positively related to both Frequency of Use and Pedagogical Application. The strongest relationship was found between AI Use and Application and Pedagogical Application ($r = .737$, $p < .001$). Therefore, there is a need for professional development that strengthens teachers' practical use of AI, critical evaluation of AI-generated information, and responsible application of AI in teaching, together with appropriate institutional guidance and digital infrastructure.

Keywords: Artificial Intelligence, AI Literacy, Educational Technology, Pedagogical Use, School Teachers, Teacher Professional Development, Sri Lanka

1. INTRODUCTION

Artificial Intelligence (AI) has become an important development in education and is increasingly used to

support teaching, learning, and assessment. Recent developments in machine learning and generative AI have made it possible to generate feedback, prepare learning materials, and provide learning recommendations with

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less human effort (Chen et al., 2020). Generative AI tools can also produce text, images, and other instructional materials that may be useful for teachers and learners (Miao & Holmes, 2023). As these tools become more widely available, schools are gradually exploring their use for teaching, learning, assessment, and some administrative activities.

AI literacy is becoming an important competency for teachers. It is not limited to awareness of AI technologies. Teachers need to understand how AI works, use AI tools appropriately, evaluate AI-generated information, recognise ethical concerns, and make responsible decisions when using AI in education (Ng et al., 2021; Chiu et al., 2023). Recent frameworks also show that teachers need knowledge, skills, and confidence to use AI and reflect on its use in educational settings. UNESCO introduced the AI Competency Framework for Teachers in 2024 to support the development of these competencies. Accordingly, AI literacy can be considered a multidimensional concept that includes knowledge, practical use, critical evaluation, ethical awareness, and responsible decision-making.

Knowing AI does not always mean that teachers use it effectively in the classroom. Previous studies show that teachers commonly use AI for activities such as preparing learning materials, generating content, and carrying out routine tasks. The use of AI for more advanced teaching purposes, such as personalised learning and adaptive instruction, is less common (Crompton & Burke, 2023). Therefore, it is important to examine not only teachers' knowledge of AI, but also how they use AI in their teaching practices.

The use of AI in education can also be influenced by institutional and technological conditions, particularly in developing-country contexts. In Sri Lanka, Henadirage and Gunarathne (2025) identified limitations in institutional policies, infrastructure, and staff preparedness as challenges to the adoption of generative AI in higher education. At the school level, Rajapakse et al. (2024) reported relatively low self-efficacy among Sri Lankan ICT teachers in teaching AI. The study also identified the need to strengthen teachers' AI-related knowledge, skills, and confidence through professional development. These studies show that teachers need both individual competencies and institutional support to use AI effectively in education.

Research on AI in Sri Lankan school education is still limited. Existing studies have mainly focused on teachers' awareness, readiness, perceptions, and self-efficacy related to AI. Less attention has been given to teachers' AI literacy and how it is connected with their pedagogical use of AI. There is also limited evidence on whether different dimensions of AI literacy are associated with teachers' use of AI across different educational contexts, including Sinhala, Tamil, and English medium schools. More evidence in this area is useful for planning teacher education programmes, professional development activities, and future educational policies related to AI integration.

Therefore, this study examines AI literacy and the

pedagogical use of AI among Sri Lankan school teachers. It examines teachers' awareness and use of AI tools, assesses AI literacy across six dimensions, examines pedagogical use of AI, identifies differences according to selected demographic characteristics, and investigates the relationship between AI literacy and pedagogical use.

2. LITERATURE REVIEW

The use of AI in education has increased in recent years. AI is now used in different areas of teaching, learning, assessment, and educational administration. Its use has also raised concerns related to pedagogy, ethics, and teachers' professional responsibilities (Chen et al., 2020). The literature reviewed in this study focuses on AI in education, AI literacy, pedagogical use of AI, factors affecting AI adoption, and ethical issues related to its use.

2.1. Artificial Intelligence in Education

AI is now used in many educational applications. These include intelligent tutoring systems, adaptive learning platforms, automated feedback, and natural-language applications. Chen et al. (2020) discussed how such applications can support teaching and learning in different ways. Unlike earlier digital technologies that were mainly used to provide access to information, AI applications can also respond to learners' needs, provide feedback, and support some teaching and assessment activities.

Likewise, Celik et al. (2022) also found that AI can support teachers in different stages of the teaching process. It can help teachers identify learners' needs, provide feedback, and support assessment. Teachers can also play an important role in evaluating the accuracy and usefulness of AI-based systems. Similarly, Crompton and Burke (2023) reported that there is increasing interest in AI in education, particularly after the emergence of generative AI tools such as ChatGPT.

Although AI provides many opportunities, its educational value depends on how it is used. Much of the existing research has been conducted in higher education and in well-resourced contexts. UNESCO (2024) therefore emphasises that AI should support educational purposes and that teachers' professional judgement should remain central when deciding how to use AI in teaching and learning.

2.2. AI Literacy: Concepts and Frameworks

AI literacy is different from general digital literacy. It refers to the knowledge and skills needed to understand AI, use AI tools, evaluate AI-generated information, and recognise ethical issues related to its use (Long & Magerko, 2020). Ng et al. (2021) describe AI literacy as a multidimensional concept that includes conceptual understanding, practical application, critical evaluation, and ethical awareness. These dimensions are important for teachers because they need to understand what AI can and cannot do, examine the quality of AI-generated information, and decide whether particular AI tools are suitable for educational purposes. Chiu et al. (2023) further emphasise the importance of applying AI appropriately in professional settings, evaluating the

reliability of AI-generated information, and understanding its wider social implications.

Research on AI literacy among teachers is still developing. [Ayanwale et al. \(2024\)](#), for example, found differences across the dimensions of AI literacy among pre-service teachers. Their findings showed that the same level of critical and ethical understanding did not always match technical understanding. This suggests that AI literacy should not be treated as a single skill, because its different dimensions may develop at different levels.

The present study uses six dimensions of AI literacy such as AI Foundations and Understanding, AI Use and Application, Critical Evaluation, Ethics and Privacy, Human–AI Interaction and Decision-Making, and Societal Awareness. These dimensions were informed by existing frameworks, particularly [Ng et al. \(2021\)](#) and [Chiu et al. \(2023\)](#). The framework also includes Societal Awareness to examine teachers' understanding of the wider influence of AI on education and society.

2.3. Pedagogical Use of AI

Teachers' use of AI in the classroom depends on more than their awareness of AI. It also depends on their readiness, confidence, training, and the support available in their schools. [Cheah et al. \(2025\)](#) found that teachers generally had positive attitudes towards generative AI, but their actual classroom use was lower than their stated intention to use it. Lack of training, unclear school policies, and limited time were identified as important reasons for this difference.

[Lee and Kwon \(2024\)](#) reviewed studies conducted between 2018 and 2023 and found that AI-related activities in schools were more often focused on learning about AI than on using AI as part of subject teaching. They also found that learning outcomes were not measured consistently across studies. This shows that the pedagogical use of AI in schools is still developing and that more attention is needed to how AI is actually used in teaching practice.

[Badawi and Adiyono \(2026\)](#) examined AI use among upper-elementary science teachers in Lebanon. They found that AI was mainly used as a replacement for traditional resources such as textbooks and worksheets. More advanced forms of AI use were less common and were more visible in schools with better resources and teachers who had received AI-related professional development. The study also showed that infrastructure, professional development, and institutional leadership influenced the way teachers used AI in their classrooms.

[Celik et al. \(2022\)](#) reported that teachers mainly used AI for activities such as feedback and routine assessment. Its use for personalised or adaptive teaching was less common. [Collie and Martin \(2025\)](#) also found that generative AI was often used for preparing content and carrying out administrative work. This shows that teachers tend to use AI first for practical and routine purposes. The use of AI for more complex teaching activities appears to depend on factors such as training, infrastructure, and support from

the institution.

2.4. Theoretical Perspectives and Factors Influencing Adoption

Teachers' use of AI in teaching is affected by their knowledge and skills, access to technology, institutional support, and their views about the usefulness of AI. These conditions may influence how AI is used in different teaching contexts. AI literacy is one factor that can influence classroom use. Teachers who understand AI, know how to use AI tools, and can evaluate AI-generated information are more able to make appropriate decisions about their use in teaching ([Ng et al., 2021](#)). Limited AI literacy may therefore affect how often teachers use AI and how they use it for educational purposes.

The Technology Acceptance Model (TAM) explains technology adoption mainly through perceived usefulness and perceived ease of use ([Davis, 1989](#)). In education, teachers are more likely to use a technology when they believe that it is useful and manageable within their teaching practice. However, TAM mainly explains the decision to accept or use a technology. It does not fully explain how well that technology is integrated into teaching.

The Technological Pedagogical Content Knowledge (TPACK) framework gives more attention to the way technology is used in teaching. It explains that effective technology integration requires teachers to combine technological knowledge, pedagogical knowledge, and subject content knowledge ([Mishra & Koehler, 2006](#)). Regarding AI, teachers need more than the ability to operate an AI tool. They also need to understand how the tool can be used in relation to teaching methods, subject content, and expected learning outcomes.

Institutional conditions can also affect teachers' use of AI. [Filiz et al. \(2025\)](#) found that institutional support and technological infrastructure were related to classroom use of AI. [Badawi and Adiyono \(2026\)](#) also reported differences between public and private schools in AI readiness, digital competence, and TPACK. Their study further identified infrastructure, access to professional development, and institutional leadership as important factors related to pedagogical use.

Ethical issues are another important part of AI use in education. Concerns about data privacy, bias, transparency, and academic integrity require teachers to make careful decisions when using AI ([Holmes et al., 2022](#)). Therefore, teachers need both technical skills and an understanding of the ethical issues connected with AI use.

TAM and TPACK provide useful perspectives for understanding teachers' use of AI. TAM helps to explain why teachers may accept or use a technology, while TPACK helps to explain how technology can be integrated into teaching. However, teachers' use of AI is also affected by institutional support, infrastructure, professional development, and ethical concerns. In the present study, particular attention is given to AI literacy and its relationship with teachers' pedagogical use of AI in the Sri Lankan school context.

2.5. Research Gap and Conceptual Framework

Previous studies show that AI has different uses in education, but its effective use depends on how teachers understand and apply it in teaching (Chen et al., 2020; Celik et al., 2022). AI literacy is also discussed as a multidimensional concept, and the different dimensions may not develop at the same level (Ng et al., 2021; Ayanwale et al., 2024). Other studies have shown that teachers' use of AI can be affected by training, infrastructure, institutional support, and school-level conditions (Cheah et al., 2025; Badawi & Adiyono, 2026; Filiz et al., 2025). Ethical issues such as privacy, bias, transparency, and responsible use are also important when AI is used in education (Holmes et al., 2022; Cotton et al., 2024).

However, there is still limited evidence on the relationship between teachers' AI literacy and their actual pedagogical use of AI. In Sri Lanka, available studies have examined areas such as teachers' self-efficacy in teaching AI and barriers to the use of generative AI in education (Henadirage & Gunarathne, 2025; Rajapakse et al., 2024). These studies provide useful evidence, but they do not examine AI literacy across several dimensions together with teachers' pedagogical use of AI. There is also limited evidence on how individual dimensions of AI literacy are related to classroom use. This is important because teachers may differ in their understanding of AI, practical use, critical evaluation, ethical awareness, and decision-making. In addition, there is little evidence on these relationships across different school contexts in Sri Lanka, including Sinhala, Tamil, and English medium schools. The present study therefore examines AI literacy across six dimensions: AI Foundations and Understanding, AI Use and Application, Critical Evaluation, Ethics and Privacy, Human-AI Interaction and Decision-Making, and Societal Awareness. It also examines two dimensions of pedagogical use: Frequency of Use and Pedagogical Application. The study focuses on the relationship between these dimensions among Sri Lankan school teachers. Figure 1 presents the conceptual framework used in the study.

Conceptual Framework of the Study

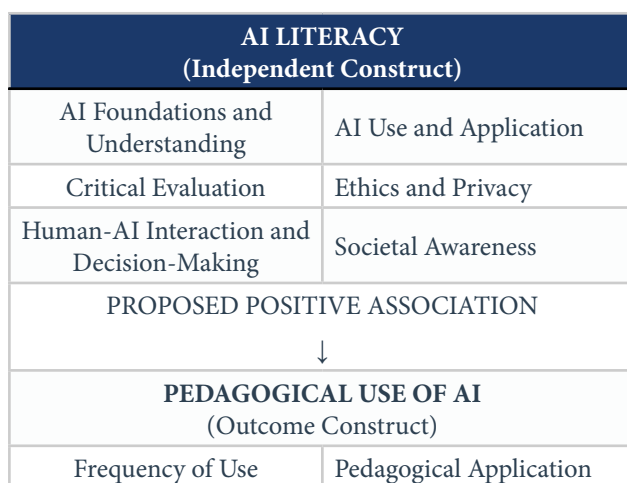


Figure 1: Conceptual framework illustrating the proposed relationship between AI literacy and the pedagogical use of

AI among Sri Lankan school teachers.

3. METHODOLOGY

This study used a quantitative survey design. The study focused on practising school teachers in Sri Lanka. Participants were recruited through convenience and snowball sampling. The researchers did not have access to a national list of teachers with contact details. To reach teachers in different parts of Sri Lanka, the questionnaire link was first shared through the researchers' professional networks. These teachers were then asked to share it with other teachers. A total of 410 valid responses were received from all 25 administrative districts. Since participants were not randomly selected, care is needed when generalising the findings to the wider teacher population. The sample included teachers from Sinhala, Tamil, and English medium schools, with different age groups, teaching experience, school locations, and subject specialisations. Data were collected through a structured online questionnaire developed based on previous literature on AI literacy and the use of AI in education (Ng et al., 2021; UNESCO, 2024; Chiu et al., 2023). The questionnaire was reviewed by two experts in educational technology and educational research to check its content validity. A pilot study was then conducted with 30 practising school teachers to examine the reliability of the instrument. Cronbach's alpha values ranged from 0.827 to 0.974 across the eight constructs. The values were 0.827 for AI Foundations and Understanding, 0.970 for AI Use and Application, 0.851 for Critical Evaluation, 0.974 for Ethics and Privacy, 0.900 for Human-AI Interaction and Decision-Making, 0.929 for Societal Awareness, 0.863 for Frequency of Use, and 0.934 for Pedagogical Application. These values exceeded the recommended threshold of 0.70, confirming satisfactory internal consistency of the instrument (Nunnally & Bernstein, 1994). The collected data were analysed with descriptive and inferential statistics to describe participants' demographic characteristics, awareness and use of AI tools, AI literacy, and pedagogical use of AI. Pearson's product-moment correlation was used to examine the relationships between the dimensions of AI literacy and pedagogical use. Statistical significance was considered at the 0.01 level, two-tailed. In addition, researchers followed ethical practices strictly. Participation in the study was voluntary. Before completing the questionnaire, participants were given an information sheet explaining the purpose of the study, their participation, and the use of the collected data. They provided informed consent electronically before starting the questionnaire.

Table 1: Demographic Characteristics of the Participants (N = 410)

Characteristic	Category	n	%
Gender	Female	312	76.1
	Male	98	23.9
Age Group (years)	20–24	7	1.7
	25–29	23	5.6
	30–34	84	20.5
	35–39	119	29.0
	40 and above	177	43.2
Teaching Experience	Less than 1 year	7	1.7
	1–5 years	61	14.9
	6–10 years	121	29.5
	11–15 years	97	23.7
	More than 15 years	124	30.2
School Type	National School	72	17.6
	Type 1AB	99	24.1
	Type 1C	125	30.5
	Type 2	71	17.3
	Type 3	20	4.9
	Private/ International School	23	5.6
School Location	Urban	217	52.9
	Rural	166	40.5
	Estate	27	6.6
Medium of Instruction	Sinhala	193	47.1
	Tamil	184	44.9
	English	33	8.0
Subject Specialisation	Social Science Subjects	95	23.2
	Languages	64	15.6
	Religion and Aesthetic Subjects	57	13.9
	Commerce	50	12.2
	Mathematics	48	11.7
	Information and Communication Technology (ICT)	47	11.5
	Science	37	9.0
	Other	12	2.9
Highest Qualification	National Diploma	38	9.3
	Bachelor's Degree	298	72.7
	Master's Degree	72	17.6
	PhD	2	0.5

Characteristic	Category	n	%
Professional Qualification	Postgraduate Diploma in Education (PGDE)	174	42.4
	Bachelor of Education (B.Ed.)	106	25.9
	National Diploma in Teaching	58	14.1
	Master of Education (M.Ed.)	43	10.5
	Other	29	7.1

4. RESULTS

4.1. Participant Characteristics

A total of 410 valid responses were received from practising school teachers across all 25 administrative districts of Sri Lanka. As shown in Table 1, the sample was diverse in terms of gender, age, teaching experience, school context, medium of instruction, subject specialisation, and qualifications.

Most respondents were female (76.1%). Teachers aged 40 years or above formed the largest age group (43.2%), followed by those aged 35–39 years (29.0%). The sample was also professionally experienced, with 83.4% reporting six years or more of teaching experience. Participants worked in different school settings, with the largest proportions teaching in Type 1C schools (30.5%) and Type 1AB schools (24.1%). More than half worked in urban schools (52.9%), while 40.5% worked in rural schools and 6.6% in estate-sector schools.

Sinhala-medium teachers accounted for 47.1% of the sample, followed closely by Tamil-medium teachers (44.9%), while 8.0% taught in the English medium. Participants represented a range of subject specialisations, with Social Science subjects forming the largest group (23.2%), followed by Languages (15.6%) and Religion and Aesthetic subjects (13.9%).

Most participants held a bachelor's degree (72.7%), while 17.6% held a master's degree. Regarding professional qualifications, the Postgraduate Diploma in Education was the most commonly reported qualification (42.4%), followed by the Bachelor of Education (25.9%). Overall, the participant profile reflects a nationally diverse and professionally experienced sample of Sri Lankan school teachers, suitable for examining AI literacy and the pedagogical use of AI.

4.2. Digital Readiness of Participants

Participants' digital readiness was examined using four indicators: digital device ownership, access to reliable internet, previous training in AI or digital technologies, and perceptions of school digital infrastructure. The findings are presented in Table 2. Access to personal digital devices was generally high, with 90.2% of participants reporting ownership of a device suitable for teaching-related activities. However, reliable internet access was less

consistent. Only 34.4% reported having reliable internet access at all times, while 44.6% had reliable access only sometimes. A further 21.0% indicated that reliable internet access was either rare or unavailable. Previous participation in AI or digital technology training was almost evenly divided. Slightly more than half of the participants (50.7%) had received some form of relevant training, while 49.3% had not. This finding points to uneven access to professional development opportunities related to AI and digital technologies. Perceptions of school digital infrastructure also varied. Approximately half of the participants (49.3%) rated their school's digital infrastructure as good or excellent, while 37.3% considered it moderate and 13.4% rated it as poor. Overall, although personal access to digital devices was widespread, limitations in internet connectivity, professional training, and school-level infrastructure may affect teachers' capacity to use AI effectively in their professional and classroom practices.

Table 2: Digital Readiness of the Participants (N = 410)

Variable	Category	n	%
Digital Device Ownership	Yes	370	90.2
	No	40	9.8
Reliable Internet Access	Always	141	34.4
	Sometimes	183	44.6
	Rarely	65	15.9
	Never	21	5.1
AI/Digital Technology Training	Yes	208	50.7
	No	202	49.3
School Digital Infrastructure	Poor	55	13.4
	Moderate	153	37.3
	Good	123	30.0
	Excellent	79	19.3

4.3. Awareness and Use of AI Tools

Teachers' awareness and use of selected AI tools were examined to understand the extent to which different applications had been adopted within their professional and teaching practices. The questionnaire included 13 tools representing general-purpose generative AI assistants, AI writing tools, lesson-planning applications, research assistants, and subject-specific educational applications. For each tool, participants indicated whether they had never heard of it, had heard of it but never used it, used it occasionally, or used it regularly.

4.3.1 Patterns of Awareness and Use

Figure 2 presents participants' awareness and use of the selected AI tools. Considerable variation was observed across the applications. ChatGPT and Gemini were the most widely used tools, with 49.5% and 47.6% of participants, respectively, reporting regular use. A further 42.4% used ChatGPT occasionally, while 39.8% used Gemini occasionally. These results show that general-purpose generative AI assistants were considerably more

widely adopted than the other tools examined. The use of specialised applications was substantially lower. Only 2.7% of participants regularly used MagicSchool.ai, while regular use of Eduaide.ai was similarly limited. Canva AI demonstrated comparatively greater adoption, with 12.0% reporting regular use and 33.9% reporting occasional use. NotebookLM was regularly used by 11.0% of participants, while Grammarly and QuillBot were regularly used by 5.9% and 4.4%, respectively. Claude, Microsoft Copilot, Perplexity AI, Photomath, and Wolfram Alpha also recorded low levels of regular use. Overall, teachers' use of AI was concentrated mainly on general-purpose applications, particularly ChatGPT and Gemini, whereas the adoption of specialised educational and subject-specific AI tools remained limited. This pattern highlights the need for professional development that introduces teachers to a broader range of pedagogically relevant AI applications and supports their informed integration into teaching and learning.

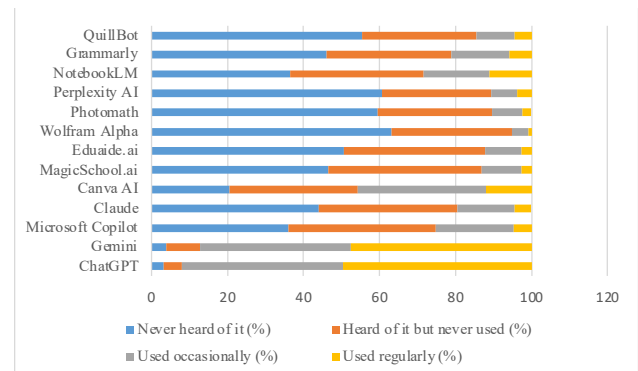


Figure 2: Awareness and Use of AI Tools among Sri Lankan School Teachers (N = 410)

4.4. AI Literacy among Sri Lankan School Teachers

Teachers' self-reported AI literacy was examined across six dimensions: AI Foundations and Understanding, AI Use and Application, Critical Evaluation, Ethics and Privacy, Human-AI Interaction and Decision-Making, and Societal Awareness. The descriptive statistics are presented in Table 3. Mean scores for all six dimensions were above the midpoint of the five-point scale, ranging from 3.49 to 3.87. Societal Awareness recorded the highest mean score ($M = 3.87$, $SD = 1.02$), suggesting that participants were particularly aware of the broader influence of AI on education and society. AI Foundations and Understanding recorded the second-highest mean score ($M = 3.61$, $SD = 0.84$). This indicates that participants reported a reasonable understanding of basic AI concepts, functions, and educational applications. Similar mean scores were recorded for Human-AI Interaction and Decision-Making ($M = 3.55$, $SD = 1.08$), Ethics and Privacy ($M = 3.54$, $SD = 1.05$), and AI Use and Application ($M = 3.54$, $SD = 1.00$). These results suggest that teachers had developed some confidence in using AI while also recognising the importance of ethical and responsible practices.

Critical Evaluation recorded the lowest mean score ($M = 3.49$, $SD = 0.99$). Although this score remained above the scale

midpoint, it was comparatively lower than the scores for the other dimensions. This finding identifies critical evaluation as an area requiring further attention, particularly teachers' ability to assess the accuracy, reliability, potential bias, and appropriateness of AI-generated information before using it in teaching and learning. Overall, the findings indicate that participants reported generally above-midpoint levels of AI literacy across the six dimensions. Their strongest area was awareness of the societal implications of AI, while critical evaluation emerged as the comparatively weakest area. However, the differences among most dimensions were modest. The standard deviations, ranging from 0.84 to 1.08, also indicate variation in teachers' reported competencies and experiences. Professional development should therefore strengthen critical evaluation skills while continuing to develop teachers' practical, ethical, and pedagogical engagement with AI.

Table 3: Descriptive Statistics for AI Literacy Dimensions among Sri Lankan School Teachers

AI Literacy Dimension	Mean	SD
AI Foundations & Understanding	3.61	0.84
AI Use & Application	3.54	1.00
Critical Evaluation	3.49	0.99
Ethics & Privacy	3.54	1.05
Human-AI Interaction & Decision-Making	3.55	1.08
Societal Awareness	3.87	1.02

4.5. Pedagogical Use of AI among Sri Lankan School Teachers

Teachers' self-reported pedagogical use of AI was examined across two dimensions: Frequency of Use and Pedagogical Application. The descriptive statistics are presented in Table 4. Both dimensions recorded mean scores above the midpoint of the five-point scale. Pedagogical Application had a slightly higher mean score ($M = 3.33$, $SD = 1.09$) than Frequency of Use ($M = 3.18$, $SD = 1.04$). Although the difference was modest, the findings suggest that teachers reported using AI for particular pedagogical purposes more strongly than they reported using it regularly in their teaching practices. The score for Frequency of Use indicates that the incorporation of AI into teaching was not yet consistent across participants. The comparatively higher score for Pedagogical Application suggests that some teachers had begun using AI to support activities such as lesson planning, instructional material preparation, assessment development, feedback, and student learning. However, the mean scores indicate that such applications had not become equally established across teachers' routine instructional practices. When considered alongside the AI literacy findings, the pedagogical-use scores were comparatively lower than most of the AI literacy dimensions. This descriptive pattern suggests that teachers' reported knowledge and awareness of AI were not uniformly reflected in frequent classroom use. However, this comparison should be interpreted cautiously, as the

relationship between AI literacy and pedagogical use is examined more directly through the correlation analysis presented in the following section. Overall, the findings indicate that the pedagogical integration of AI among the participating teachers was developing but remained uneven. The standard deviations for both dimensions also show considerable variation in teachers' reported practices. These findings point to the need for targeted professional development and appropriate institutional support to strengthen the consistent and pedagogically meaningful use of AI.

Table 4: Descriptive Statistics for Pedagogical Use of AI among Sri Lankan School Teachers

Pedagogical Use Dimension	Mean	SD
Frequency of Use	3.18	1.04
Pedagogical Application	3.33	1.09

4.6. Differences in AI Literacy and Pedagogical Use According to Gender

An independent-samples t-test was conducted to examine whether male and female teachers differed in their levels of AI literacy and pedagogical use of AI. The results are presented in Table 5.

Table 5: Gender Differences in AI Literacy and Pedagogical Use of AI

Variable	Female (n=312) Mean $\pm$ SD	Male (n=98) Mean $\pm$ SD	t	p
AI Foundations & Understanding	3.63 $\pm$ 0.82	3.55 $\pm$ 0.91	0.88	.381
AI Use & Application	3.60 $\pm$ 0.96	3.34 $\pm$ 1.09	2.33	.020*
Critical Evaluation	3.54 $\pm$ 0.95	3.33 $\pm$ 1.11	1.68	.094
Ethics & Privacy	3.62 $\pm$ 1.03	3.30 $\pm$ 1.10	2.67	.008**
Human-AI Interaction & Decision-Making	3.61 $\pm$ 1.04	3.36 $\pm$ 1.18	2.00	.046*
Societal Awareness	3.92 $\pm$ 0.98	3.69 $\pm$ 1.13	1.80	.073
Frequency of AI Use	3.26 $\pm$ 1.02	2.96 $\pm$ 1.06	2.48	.013*
Pedagogical Application	3.38 $\pm$ 1.06	3.17 $\pm$ 1.17	1.72	.087

Note. * $p < .05$, ** $p < .01$.

The results indicate that female teachers reported

significantly higher levels of AI Use & Application, Ethics & Privacy, Human–AI Interaction & Decision-Making, and Frequency of AI Use than male teachers. No statistically significant gender differences were observed for AI Foundations & Understanding, Critical Evaluation, Societal Awareness, or Pedagogical Application. These findings suggest that although overall AI literacy was broadly comparable between male and female teachers, female teachers demonstrated slightly stronger practical engagement with AI, greater awareness of ethical issues, and more frequent use of AI in their professional practice.

4.7. Differences in AI Literacy and Pedagogical Use According to Age Group

A one-way analysis of variance (ANOVA) was conducted to examine whether AI literacy and pedagogical use differed across teachers' age groups. The results are presented in Table 6.

Table 6: Differences in AI Literacy and Pedagogical Use According to Age Group

Variable	F	p	Significant Tukey HSD Comparison(s)
AI Foundations & Understanding	5.19	< .001***	30–34 years > 40 years and above; 35–39 years > 40 years and above
AI Use & Application	3.27	.012*	35–39 years > 40 years and above
Critical Evaluation	5.73	< .001***	25–29 years > 40 years and above; 30–34 years > 40 years and above; 35–39 years > 40 years and above
Ethics & Privacy	7.06	< .001***	25–29 years > 40 years and above; 30–34 years > 40 years and above; 35–39 years > 40 years and above
Human–AI Interaction & Decision-Making	4.09	.003**	30–34 years > 40 years and above; 35–39 years > 40 years and above
Societal Awareness	4.50	.001**	30–34 years > 40 years and above; 35–39 years > 40 years and above
Frequency of AI Use	2.16	.072	Not significant
Pedagogical Application	3.95	.004**	35–39 years > 40 years and above

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

The one-way ANOVA revealed statistically significant differences among age groups for all six dimensions of AI literacy, with the exception of Frequency of AI Use. Significant differences were also observed for Pedagogical Application. Tukey HSD post hoc comparisons indicated a consistent pattern across the significant dimensions. Teachers aged 30–34 years and 35–39 years generally reported significantly higher levels of AI literacy than teachers aged 40 years and above. Similar differences were observed for Critical Evaluation and Ethics & Privacy, where teachers aged 25–29 years also scored significantly higher than those aged 40 years and above.

For pedagogical use, teachers aged 35–39 years demonstrated significantly higher levels of Pedagogical Application than teachers aged 40 years and above, whereas no significant age-group differences were found for Frequency of AI Use. Overall, these findings suggest that teachers in the younger and middle-age groups reported stronger AI literacy and greater pedagogical application of AI than older teachers.

4.8. Differences in AI Literacy and Pedagogical Use According to Teaching Experience

A one-way analysis of variance (ANOVA) was conducted to examine whether teachers' AI literacy and pedagogical use differed according to their teaching experience. The results are presented in Table 7.

Table 7: Differences in AI Literacy and Pedagogical Use According to Teaching Experience

Variable	F	p	Interpretation
AI Foundations & Understanding	2.86	.023*	Significant difference
AI Use & Application	2.34	.055	Not significant
Critical Evaluation	4.20	.002**	Significant difference
Ethics & Privacy	4.46	.002**	Significant difference
Human–AI Interaction & Decision-Making	2.76	.028*	Significant difference
Societal Awareness	2.94	.021*	Significant difference
Frequency of AI Use	2.06	.085	Not significant
Pedagogical Application	2.27	.061	Not significant

Note. * $p < .05$, ** $p < .01$.

The one-way ANOVA revealed statistically significant differences according to teaching experience in five dimensions of AI literacy: AI Foundations & Understanding, Critical Evaluation, Ethics & Privacy, Human–AI Interaction & Decision-Making, and Societal Awareness. However, no statistically significant differences were found for AI Use & Application, Frequency of AI Use, or Pedagogical Application. These findings suggest

that teachers' professional experience is associated with several aspects of AI literacy, particularly those related to conceptual understanding, critical evaluation, ethical awareness, and human-AI interaction. Nevertheless, differences in teaching experience did not appear to influence how frequently teachers used AI or the extent to which they applied AI in their classroom practices.

4.9. Differences in AI Literacy and Pedagogical Use According to Medium of Instruction and School Location

One-way analyses of variance (ANOVA) were conducted to examine whether AI literacy and pedagogical use differed according to teachers' medium of instruction and school location. The results are presented in Table 8.

Table 8: Differences in AI Literacy and Pedagogical Use According to Medium of Instruction and School Location

Variable	Medium of Instruction <i>F</i> (<i>p</i>)	School Location <i>F</i> (<i>p</i>)
AI Foundations & Understanding	0.91 (.403)	0.67 (.513)
AI Use & Application	1.72 (.181)	0.82 (.443)
Critical Evaluation	3.77 (.024*)	1.45 (.236)
Ethics & Privacy	1.06 (.347)	0.79 (.454)
Human-AI Interaction & Decision-Making	0.36 (.697)	0.52 (.596)
Societal Awareness	1.16 (.315)	0.93 (.395)
Frequency of AI Use	0.97 (.381)	1.18 (.309)
Pedagogical Application	0.81 (.447)	0.74 (.476)

Note. * $p < .05$.

The one-way ANOVA revealed no statistically significant differences in AI literacy or pedagogical use across teachers' medium of instruction, with the exception of Critical Evaluation ($F = 3.77$, $p = .024$). Post hoc comparisons indicated that the significant difference was limited to selected language groups, while the remaining AI literacy dimensions and pedagogical use measures did not differ significantly across Sinhala-, Tamil-, and English-medium teachers. Similarly, no statistically significant differences were observed according to school location. Teachers working in urban, rural, and estate schools demonstrated comparable levels of AI literacy and pedagogical use across all dimensions. These findings suggest that language of instruction and school location had minimal influence on teachers' AI-related competencies and classroom use of AI within the present sample.

4.10. Relationship Between AI Literacy and Pedagogical Use of AI

Pearson's product-moment correlation analysis was conducted to examine the relationship between the six dimensions of AI literacy and teachers' pedagogical use of AI. The results are presented in Table 9.

Table 9: Pearson Correlations between AI Literacy Dimensions and Pedagogical Use of AI

AI Literacy Dimension	Frequency of AI Use	Pedagogical Application
AI Foundations & Understanding	.503**	.583**
AI Use & Application	.650**	.737**
Critical Evaluation	.520**	.605**
Ethics & Privacy	.503**	.598**
Human-AI Interaction & Decision-Making	.438**	.569**
Societal Awareness	.376**	.511**

Note. ** $p < .01$ (two-tailed).

Pearson's correlation analysis revealed statistically significant positive relationships between all six dimensions of AI literacy and both dimensions of pedagogical use ($p < .01$). The strongest positive relationship was observed between AI Use & Application and Pedagogical Application ($r = .737$), indicating that teachers who reported higher levels of practical AI knowledge and application were more likely to integrate AI into their classroom teaching. Similarly, Critical Evaluation ($r = .605$), Ethics & Privacy ($r = .598$), and AI Foundations & Understanding ($r = .583$) demonstrated moderate to strong positive relationships with pedagogical application. Positive and statistically significant correlations were also observed between all AI literacy dimensions and Frequency of AI Use, although these relationships were generally weaker than those observed for pedagogical application. Among these, AI Use & Application showed the strongest association ($r = .650$), whereas Societal Awareness demonstrated the weakest, albeit still statistically significant, relationship ($r = .376$).

Overall, the findings indicate that teachers with higher levels of AI literacy tended to report more frequent and more meaningful pedagogical use of AI. These results support the view that AI literacy is closely associated with teachers' capacity to integrate AI into teaching and learning activities.

5. DISCUSSION

5.1. Awareness and Use of AI Tools

The results show that ChatGPT and Gemini were the most commonly used AI tools among the teachers. Use of educational, research-oriented and subject-specific AI applications was much lower. One possible reason is that ChatGPT and Gemini are widely available and can support many teaching-related tasks, such as preparing lessons,

developing questions, and producing learning materials. Similar patterns have been reported in previous studies, where teachers first used general-purpose AI tools before becoming familiar with more specialised applications (Celik et al., 2022; Cheah et al., 2025). The low use of tools such as MagicSchool.ai, Eduaide.ai, Photomath and Wolfram Alpha may also be related to limited awareness, access or training. This shows the need to familiarise teachers with a wider range of AI tools for different subjects and teaching purposes.

5.2. AI Literacy among Teachers

The teachers reported scores above the midpoint in all six dimensions of AI literacy. Societal Awareness recorded the highest score, while Critical Evaluation recorded the lowest. This means that teachers appeared to be more aware of the influence of AI on education and society than confident in evaluating the accuracy, reliability and possible bias of AI-generated information. The differences across the six dimensions also show that AI literacy does not develop equally in all areas. This is consistent with previous studies that describe AI literacy as a multidimensional concept (Ng et al., 2021; Ayanwale et al., 2024). For teachers, awareness of AI is not enough. They also need to be able to judge whether AI-generated information is accurate, appropriate and useful for teaching. This is also an area emphasised in the UNESCO AI Competency Framework for Teachers (UNESCO, 2024).

5.3. Pedagogical Use of AI

The teachers reported moderate levels of Frequency of Use and Pedagogical Application. Pedagogical Application was slightly higher than Frequency of Use. This shows that some teachers were already using AI for particular teaching activities, such as lesson planning, preparing instructional materials, assessment and feedback. However, AI was not yet used regularly by all teachers. Regular use may be affected by internet access, school infrastructure, professional training, institutional support and teachers' confidence in selecting suitable AI tools. Similar issues have been reported in previous studies (Cheah et al., 2025; Filiz et al., 2025). Therefore, teachers need practical opportunities to use AI in relation to their own subjects and classroom activities, rather than only being introduced to AI tools in general.

5.4. Differences According to Demographic Characteristics

Differences were found in some dimensions of AI literacy and pedagogical use according to gender, age and teaching experience. Female teachers reported higher scores in AI Use and Application, Ethics and Privacy, Human-AI Interaction and Frequency of Use. Differences were also found among age groups, with some younger and middle-age groups reporting higher scores than teachers aged 40 years and above. Teaching experience was related to several dimensions of AI literacy, but not to Frequency of Use or Pedagogical Application. This may mean that teaching experience is related to some aspects of teachers' understanding and judgement of AI, but not necessarily

to how often they use it in teaching. These findings should be interpreted carefully because the demographic groups were not equal in size and the study used non-probability sampling. Only limited differences were found according to medium of instruction and school location. Within this sample, AI literacy and pedagogical use were generally similar across these groups.

5.5. Relationship between AI Literacy and Pedagogical Use

All six dimensions of AI literacy were positively related to Frequency of Use and Pedagogical Application. The strongest relationship was between AI Use and Application and Pedagogical Application. Teachers who reported stronger practical knowledge and use of AI also tended to report greater use of AI for teaching activities. Critical Evaluation, Ethics and Privacy, and AI Foundations and Understanding were also positively related to Pedagogical Application. This shows that teachers' pedagogical use of AI is related to several areas of AI literacy, not only their ability to use AI tools. Understanding AI, evaluating AI-generated information and recognising ethical issues are also relevant to its use in teaching (Celik, 2023; UNESCO, 2024). However, these relationships do not show cause and effect. The study used a cross-sectional design, and both AI literacy and pedagogical use were based on teachers' self-reported responses. It is also possible that teachers develop their AI literacy through continued use of AI. Further studies over a longer period would be useful to understand how these two areas develop.

6. LIMITATIONS

This study has several limitations. Participants were recruited through non-probability convenience and snowball sampling. Recruitment through professional networks and voluntary participation may have introduced sampling bias. Although responses were received from teachers across all 25 administrative districts and different school types, locations and media of instruction, the sample cannot be considered statistically representative of all Sri Lankan school teachers. The study also depended on self-reported questionnaire data. Teachers' responses may not always reflect their actual classroom practice. Their answers may have been influenced by their own perceptions, memory or the way they wished to present their use of AI.

The cross-sectional design is another limitation. Data were collected at one point in time, and therefore the relationships identified in the study cannot be interpreted as causal. AI tools and their use in education are also changing rapidly, and the findings reflect the period in which the data were collected. Even with these limitations, the study provides evidence from 410 practising teachers from all 25 administrative districts of Sri Lanka. It gives useful information on teachers' AI literacy, their use of different AI tools and their pedagogical use of AI.

7. IMPLICATIONS

The findings have several implications for teacher professional development and educational practice.

Professional development should give teachers practical opportunities to use AI for lesson planning, teaching, assessment, feedback and preparation of learning materials. More attention is also needed to teachers' ability to check the accuracy, reliability and possible bias of AI-generated information before using it in teaching. Training should also cover privacy, ethical responsibilities and the role of teachers' professional judgement when AI is used to support educational decisions. Teachers also need exposure to a wider range of educational and subject-specific AI applications. At present, their use appears to be concentrated mainly on ChatGPT and Gemini. Professional development linked to subject areas and classroom needs may help teachers use AI for more specific teaching purposes.

At the policy level, clear guidance is needed on the responsible use of AI in schools. This should include issues such as data privacy, academic integrity, transparency, teacher responsibility and the use of AI-generated materials with students. Internet access, suitable devices and school-level technical support also need attention. Professional development alone may not be sufficient if teachers do not have the necessary infrastructure and continuing support. Future studies may use probability sampling to improve representativeness. Longitudinal studies could examine changes in teachers' AI literacy and pedagogical use over time. Mixed-method studies using questionnaires, interviews, classroom observations and teaching materials may also provide a clearer understanding of how AI is used in practice. Further studies may examine the role

of institutional support, attitudes, self-efficacy, digital competence, subject specialisation and access to resources.

8. CONCLUSION

This study examined AI literacy, awareness and use of AI tools, and the pedagogical use of AI among Sri Lankan school teachers. ChatGPT and Gemini were the most widely used tools, while educational, research-oriented and subject-specific tools were used less frequently. AI literacy scores were above the midpoint in all six dimensions. Societal Awareness recorded the highest score and Critical Evaluation the lowest. Pedagogical Application was slightly higher than Frequency of Use. This shows that teachers were using AI for some teaching purposes, but regular use was not yet common across all participants. Differences were found in some areas according to gender, age and teaching experience, while differences by medium of instruction and school location were limited. All six dimensions of AI literacy were positively related to pedagogical use. Teachers with higher AI literacy scores also tended to report greater use of AI in teaching. However, because the study was cross-sectional, these relationships should not be interpreted as causal. The findings point to the need to strengthen teachers' practical use of AI and their ability to evaluate AI-generated information. Professional development, institutional guidance and access to appropriate digital resources are also important for supporting the responsible use of AI in Sri Lankan schools.

DECLARATIONS

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The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Competing Interests

The authors declare that they have no conflict of interest.

Clinical Trial Registration (if applicable)

Not Applicable

Human Ethics and Consent to Participate

The study did not involve any clinical intervention or medical procedure. Therefore, formal clinical ethical approval was not required. Participation was voluntary, and all participants were informed about the purpose of the study, the confidentiality of their responses, and their right to withdraw at any time. Informed consent was obtained from all participants before data collection.

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