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ASSESSING THE COMPETENCIES OF SECONDARY SCHOOL TEACHERS ON AI TOOLS FOR TEACHING: A STUDY IN KANDY DISTRICT, SRI LANKA

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The rapid advancement of Artificial Intelligence (AI) offers transformative opportunities for improving teaching and learning practices globally. However, teachers face considerable challenges in accessing and utilizing AI tools effectively in secondary school Kandy District in Sri Lanka. This study aimed to assess the knowledge, attitudes, and experiences of 75 secondary school teachers regarding the integration of AI in teaching. A quantitative descriptive survey design and convenience sampling method were used to collect quantitative data via an online questionnaire, which explored teachers' demographic profiles, awareness of AI, usage frequency, confidence levels, perceived barriers, and support needs. The findings revealed that although 57.3% of respondents were aware of AI tools in education, actual classroom usage was limited; only 10.7% used AI tools often or always, while 40% reported rarely or never using them. Confidence in using AI tools was generally low, with 65.3% indicating minimal or no confidence. Major challenges included a lack of training (60%), insufficient infrastructure (53.3%), limited institutional support (46.7%), heavy workloads (57%), and language barriers (40%). Teachers expressed strong interest in professional development, with 66.7% supporting training workshops, 60% requesting clear policies, 62.7% advocating for improved infrastructure, and over half emphasizing the need for peer mentoring and local-language resources. While 28% of teachers believed AI could enhance teaching and learning, nearly 49.3% remained neutral, indicating uncertainty or lack of exposure. Furthermore, 40% were undecided about participating in AI training programs. These results highlight an urgent need for strategic interventions at the institutional and policy levels to address knowledge gaps, strengthen teacher capacity, and ensure equitable access to AI resources. The study concludes that effective and ethical integration of AI tools into Sri Lankan secondary education requires ongoing teacher support, infrastructure development, and localized training initiatives tailored to the specific needs of schools in regions like Kandy.

Keywords: artificial intelligence, teacher training, secondary education, AI adoption, Sri Lanka

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Introduction

Artificial Intelligence (AI) is increasingly recognized as a transformative force in education, offering opportunities to enhance teaching effectiveness and student learning outcomes worldwide (United States Department of Education, 2024). While previous research has identified general challenges in AI adoption, there is limited empirical evidence specifically addressing the perspectives and needs of secondary school teachers in Kandy District, Sri Lanka, making this study essential to inform contextually relevant interventions. These barriers hinder the integration of AI technologies into classroom practices, thereby limiting their potential benefits. Existing research predominantly focuses on higher education or policy frameworks, leaving a critical gap regarding secondary school teachers' awareness, attitudes, and practical challenges related to AI adoption in Sri Lanka. This study aims to fill this gap by assessing the knowledge, perceptions, and support needs of secondary school teachers in Kandy District concerning AI tools for teaching. The research seeks to inform targeted interventions to promote effective, ethical, and sustainable AI integration in Sri Lankan secondary education.

Main Objective

To assess the competencies of secondary school teachers in Kandy District in using AI tools for teaching.

Specific Objectives

1. To assess secondary school teachers' awareness and use of AI tools.
2. To examine secondary school teachers' confidence and perceptions of AI's usefulness.
3. To identify barriers to effective AI integration among secondary school teachers.
4. To explore secondary school teachers' support needs and attitudes toward AI training and policies.

Research Questions

1. What is the level of awareness and use of AI tools among secondary school teachers?
2. How confident are secondary school teachers in using AI tools, and what are their perceptions of their educational usefulness?
3. What are the main barriers preventing secondary school teachers from effectively integrating AI tools into teaching?

4. What support do secondary school teachers need, and what are their attitudes toward AI-related training and policies?

Methodology

A quantitative descriptive survey design was employed to systematically collect data on secondary school teachers' characteristics and perceptions regarding AI tools. Using a convenience sampling method, 75 teachers from various school types (1AB, 1C & Type 2) within Kandy District were selected. Data were gathered through a structured online questionnaire consisting of demographic information, AI awareness, frequency of AI tool usage, confidence levels, perceived challenges, and support needs. The questionnaire included Likert-scale items and multiple-choice questions and was piloted for clarity and reliability. Quantitative data were analyzed using descriptive statistics (frequencies and percentages), with results presented in tabular form to illustrate key trends.

Results and Discussion

Demographic Profile: Among the 75 respondents, 66.7% were female and 33.3% male. The largest age group (48%) were aged between 31 and 40 years. Regarding experience, 37.3% had 11 to 15 years of teaching, and 84% reported receiving ICT or digital tool training within the last five years. (see Table 1).

AI Awareness and Usage: AI Awareness and Usage: While 57.3% of teachers had heard about the use of Artificial Intelligence (AI) in education, actual utilization remained limited. Only 10.7% reported that they were always using AI tools in their teaching, whereas 40% rarely or never engaged with such technology. Confidence levels were generally low, with 65.3% rating themselves as having little or no confidence in using AI tools. Regarding perceived benefits, 26.7% of teachers rated AI's usefulness in education as high, 33.3% perceived medium benefits, and 40% considered it low or not useful. (see *Figure 1,2,3 & 4)*

Challenges in AI Integration: The primary barriers identified included lack of knowledge or training hindering AI tool use for 60% of teachers, insufficient access to devices or reliable internet affecting 53.3%, lack of school support was noted by 46.7%, heavy workloads beings a challenge for 57%, language barriers restricting use for 40%, student misuse of AI tools concerning 57%, lack of confidence in personal digital skills affected 54%, uncertainty about ethical or legal issues of AI accounting for 60%, and fear of AI replacing teachers in the future being perceived by 51%. These results are consistent with previous studies reporting infrastructural and capacity constraints within Sri Lankan educational settings (Perera et al., 2018; Fernando & Jayasinghe, 2020). (see Table 2).

Support Needs and Attitudes: Teachers expressed a strong demand for targeted professional development, with 66.7% supporting specific AI training programs. Additionally, 60% requested clear institutional policies regarding AI use, while 62.7% highlighted the need for improved infrastructure. Over half (52.7%)

emphasized peer mentoring, and 54.6% advocated for training materials and resources in local languages. Although only 28% agreed that AI could improve teaching and learning, nearly half remained neutral, reflecting uncertainty or limited exposure. Regarding willingness to participate in AI-related workshops, 34.7% showed interest, while 40% were undecided, indicating a need for increased awareness initiatives. (see Table 3).

Integrated Discussion:

These findings reveal immediate and systemic challenges to AI adoption in secondary schools within Kandy District. Limited teacher confidence and low AI tool usage underscore the need for sustained capacity building beyond brief training, consistent with Rajapakse et al. (2024) emphasizing self-efficacy's role in AI readiness. Continuous professional development incorporating practical sessions, peer collaboration, and subject-specific AI applications could enhance preparedness. Language barriers highlight the necessity of developing localized AI resources in Sinhala and Tamil, aligning with UNESCO's AI Competency Framework (2023). Addressing workload concerns through AI automation may foster positive attitudes toward technology integration.

Furthermore, insufficient institutional support reflects leadership's critical role, echoing Ediriweera et al. (2024) on infrastructure and policy challenges. Ensuring equitable access to AI infrastructure is vital to prevent widening educational disparities. These findings call for holistic, context-sensitive strategies to enable effective AI integration in Sri Lankan secondary education.

Conclusion and Recommendations

This study reveals significant gaps in AI knowledge, confidence, and infrastructure among secondary school teachers in Kandy District, Sri Lanka. Despite moderate awareness, practical adoption remains low due to multiple barriers, including limited training, inadequate resources, and language challenges. The findings underscore an urgent need for comprehensive, context-specific professional development programs, clear policy frameworks, and investments in school infrastructure to facilitate equitable and effective AI integration. Additionally, fostering peer support networks and developing localized AI learning materials can empower teachers to overcome challenges and harness AI's potential responsibly. Policymakers and educational leaders should prioritize these interventions to enhance teaching quality and student learning outcomes in Sri Lankan secondary education.

Acknowledgements

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Tables

Table 1. Demographic Profile of Respondents

Variable	Category	Count	Percentage
Gender	Male	25	33.3%
	Female	50	66.7%
Years of Teaching Exp.	Less than 1 year	5	6.7%
	1–5 years	9	12.0%
	6–10 years	17	22.7%
	11–15 years	28	37.3%
	More than 15 years	17	22.7%

Table 2. Challenges in Using AI Tools

Barriers	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Lack of knowledge or training hinders use of AI tools	8.0%	12.0%	20.0%	40.0 %	20.0%
Insufficient access to devices or internet	6.7%	13.3%	26.7%	36.0 %	17.3%
Lack of school support for AI integration	10.6%	18.7%	24.0%	32.0 %	14.7%
Too busy with workload to learn AI tools	7.0%	14.7%	21.3%	38.7 %	18.3%
Language barriers restrict AI use	12.0%	17.3%	30.7%	27.0 %	13.0%
Concerns about student misuse of AI tools	9.3%	12.3%	21.4%	36.0 %	21.0%
Lack of confidence in personal digital skills	8.0%	16.0%	22.0%	37.3 %	16.7%
Uncertainty about ethical/legal issues of AI	5.7%	14.3%	20.0%	41.0 %	19.0%
Fear of AI replacing teachers in the future	10.0%	18.0%	21.0%	30.0 %	21.0%

Table 3: Support Needs for AI Integration in Schools

Support Needed	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Training programs/workshops for teachers	5.3%	8.0%	20.0%	38.7%	28.0%
Clear policies/guidelines on AI use in education	6.7%	10.7%	22.7%	35.0%	25.0%
Improved school infrastructure (devices, internet)	7.3%	11.3%	18.7%	36.0%	26.7%
Peer support or mentoring for AI tool use	9.3%	14.7%	23.3%	30.7%	22.0%

Local language tutorials/resources	8.0%	12.0%	25.3%	29.3%	25.3%

Fingures

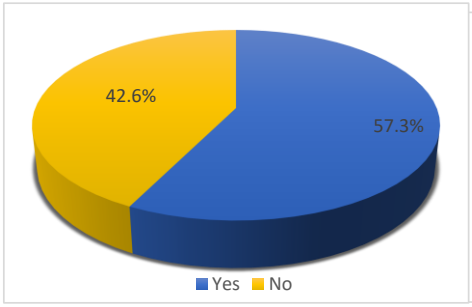


Figure 1: Heard of AI in Education

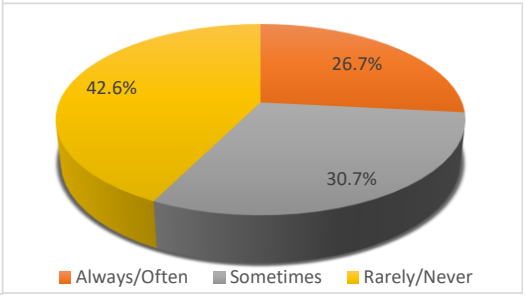
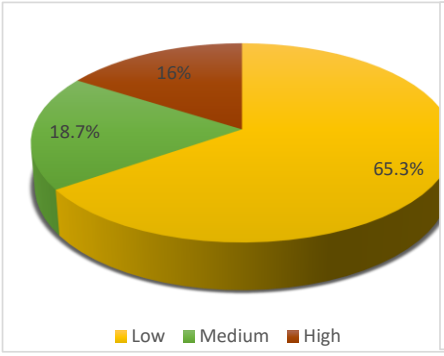


Figure 2: Usage of AI



Tools in Teaching Figure 3: Confidence in Using AI Tools

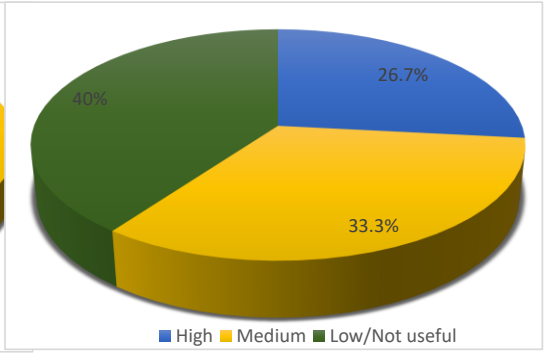


Figure 4: Perceived Benefits of AI in Education