INTERNATIONAL JOURNAL OF RESEARCH CULTURE SOCIETY ISSN (O): 2456-6683
Monthly Peer-Reviewed, Refereed, Indexed Journal [Impact Factor: 9.241]
Volume - 9, Issue - 07, Year - 2025

DOIs:10.2017/IJRCS/202507030 --:-- Research Paper / Article / Review

A Study of Secondary School Teachers' Awareness on Artificial Intelligence (AI)

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Abstract: *Artificial Intelligence (AI) is increasingly shaping the education sector, offering innovative tools for personalized learning, automation, and data-driven decision-making. However, the effective integration of Artificial Intelligence in education depends on teachers' awareness, understanding, and readiness to utilize Artificial Intelligence powered tools. This study aims to assess the awareness of Artificial Intelligence among secondary school teachers, analyzing variations based on school type medium of instruction gender, location and subject specialization. The descriptive survey research design was employed, using a structured questionnaire to collect data from 400 secondary school teachers selected through stratified random sampling. Data analysis was conducted using descriptive statistics and t-tests to determine significant differences between groups. The findings indicate that private school teachers have significantly higher Artificial Intelligence awareness than government school teachers and English medium teachers exhibit greater Artificial Intelligence awareness than Kannada medium teachers. No statistically significant difference was observed between male and female teachers. However, urban teachers' demonstrated significantly higher Artificial Intelligence awareness than rural teachers and science teachers scored significantly higher than arts teachers. The study highlights critical gaps in Artificial Intelligence awareness, particularly among government school teachers, rural teachers, and arts teachers, suggesting the need for targeted Artificial Intelligence training programs and curriculum enhancements. The findings provide valuable insights for educational policymakers, school administrators, and teacher training institutions to bridge Artificial Intelligence awareness disparities and promote equitable Artificial Intelligence integration in secondary education. Addressing these gaps is essential to prepare educators and students for an Artificial Intelligence driven in future.*

Key Words: *Artificial Intelligence, Awareness, Secondary school teachers, Science and Arts Subject,*

1. INTRODUCTION:

The Artificial Intelligence (AI) is rapidly transforming various sectors, including education, by introducing new methods of teaching, learning, and administration. As Artificial Intelligence powered tools become increasingly integrated into classrooms, it is essential for educators, particularly secondary school teachers, to be aware of Artificial Intelligence capabilities, applications, and potential impact on education. Artificial Intelligence can enhance personalized learning, automate administrative tasks, and provide valuable insights into student performance. However, a lack of awareness and understanding of Artificial Intelligence among teachers may hinder its effective adoption and utilization in schools.

This study aims to assess the awareness of Artificial Intelligence among secondary school teachers, exploring their knowledge, perceptions, and readiness to integrate Artificial Intelligence driven tools into their teaching practices. By identifying gaps in awareness and potential challenges, this research seeks to provide insights that can help develop training programs and policies to equip teachers with the necessary skills and knowledge to leverage Artificial Intelligence effectively in education. Understanding teachers' awareness of Artificial Intelligence is crucial in ensuring that they are prepared to guide students in an Artificial Intelligence driven future and maximize the benefits of this transformative technology in the classroom.

2. SIGNIFICANCE OF THE STUDY :

Artificial Intelligence (AI) is rapidly transforming various sectors, including education. Understanding Artificial Intelligence impact and potential applications in teaching and learning is crucial for educators to effectively integrate technology into their classrooms. This study on secondary school teachers' awareness of Artificial Intelligence is significant for several reasons. By assessing teachers' knowledge of Artificial Intelligence this study can help identify gaps and provide insights into how Artificial Intelligence driven tools can be integrated into teaching methods to improve learning outcomes. The findings can highlight the need for Artificial Intelligence related training and workshops for teachers, ensuring they are well-equipped to use Artificial Intelligence powered educational tools effectively. Educational policymakers can use the study's findings to design curricula that incorporate Artificial Intelligence literacy for both teachers and students, fostering a more technology-driven learning environment. Understanding teachers' awareness of Artificial Intelligence can also help address disparities in technology adoption across schools, ensuring equitable access to Artificial Intelligence resources. As Artificial Intelligence becomes increasingly relevant in various career fields, equipping teachers with Artificial Intelligence knowledge ensures that students receive relevant and up-to-date education to thrive in an Artificial Intelligence driven world. This study will provide valuable insights into the current state of Artificial Intelligence awareness among secondary school teachers and contribute to the ongoing efforts to modernize education through technological advancements.

3. LITERATURE REVIEW:

Holmes et al. (2020) AI in Teaching and Learning: Challenges and Benefits, study on 300 secondary school teachers from the United Kingdom. Result is AI supported learning tools improved personalized education, but ethical concerns and inadequate institutional support slowed adoption. Teachers emphasized the necessity of structured policies to ensure responsible AI integration in education.

Hwang, Tu, and Wang (2021) AI Literacy among Educators: A Cross-Cultural Perspective, Sample 700 teachers from China, the United States, and Germany. The research indicated a disparity in AI awareness between nations, with educators in technologically advanced regions demonstrating greater familiarity. The study advocated for globally coordinated AI training initiatives to ensure equitable access to AI knowledge.

Chen and Zhang (2022) ‘Effect of AI Training on Teachers’ Willingness to Integrate Technology. Sample 250 teachers from urban and rural schools in China. Teachers who participated in AI training programs exhibited a 40% improvement in confidence when using AI-powered educational tools. The study found that science educators were more open to AI adoption compared to humanities teachers, indicating a subject-specific difference in AI awareness.

Patil and Rao (2023) AI Awareness among Urban and Rural Teachers in India, Sample: 400 secondary school teachers from different regions in India. Teachers in urban areas demonstrated a significantly higher understanding of AI due to greater exposure to digital resources and training. The study recommended targeted AI training programs for rural teachers to address the disparity in technology adoption.

Singh and Verma (2023) Teachers’ Attitudes toward AI in Education, research on 200 secondary school teachers from both public and private institutions in India. The majority of teachers acknowledged AI’s potential benefits, but many expressed concerns about ethical implications, student over-reliance on AI, and data privacy. The study suggested the implementation of regulatory frameworks to guide AI usage in schools.

Ali and Gupta (2024) AI Awareness across Different Subject Areas in India, Sample is 350 secondary school teachers from diverse academic disciplines. Science and mathematics teachers displayed higher AI awareness than arts and humanities educators. The study proposed the integration of AI-related content into all subject areas to ensure uniform technological literacy among teachers.

Lee et al. (2024) Impact of AI Training on Teaching Strategies, 180 teachers from AI-integrated schools in South Korea. Teachers who received AI training incorporated more technology-driven strategies in their instruction. Schools that provided AI professional development programs observed a notable increase in teachers' confidence and willingness to embrace AI-based teaching methods.

4. OBJECTIVES:

1 To study awareness regarding Artificial Intelligence among secondary school teachers.
2 To compare the awareness of Artificial Intelligence between English and Kannada medium secondary school teachers.
3 To examine the differences in Artificial Intelligence awareness between male and female secondary school teachers.
4 To analyze the differences in Artificial Intelligence awareness among urban and rural secondary school teachers.
5 To compare the awareness of Artificial Intelligence between science and arts teachers in secondary schools

5. RESEARCH HYPOTHESIS:

1. There is no significant difference awareness of Artificial Intelligence among secondary school teachers.
2. There is no significant difference awareness of Artificial Intelligence between teachers from English and Kannada medium secondary schools.
3. There is no significant difference awareness of Artificial Intelligence between male and female secondary school teachers.
4. There is no significant difference awareness of Artificial Intelligence between teachers in urban and rural secondary schools.
5. There is no significant difference awareness of Artificial Intelligence between science and arts teachers in secondary schools.

6. RESEARCH METHOD:

Research Method:
This study will adopt a descriptive survey research design to assess the awareness, perceptions, and challenges faced by secondary school teachers regarding Artificial Intelligence. This design is suitable as it allows for the collection of data from a large sample to analyze trends and relationships effectively.

Population and sample:
The totals of 400 secondary school teachers were selected using a stratified random sampling method. The sample was evenly divided across various demographic categories: 200 teachers from government schools and 200 from private schools, 200 from Kannada medium and 200 from English medium institutions, 200 male and 200 female teachers, 200 from urban areas and 200 from rural areas, along with 100 science teachers and 100 arts teachers. This diverse representation allowed for a thorough examination of Artificial Intelligence awareness among different groups of secondary school teachers.

Data collection methods:
The structured questionnaire will be designed to assess teachers' awareness, perceptions, and challenges related to AI. The data collected in Chikkamagalur District Karnataka.

7. DATA ANALYSIS:

Data from the questionnaire will be analyzed using descriptive statistics (percentages, mean, standard deviation and t test) using statistical software such as Excel. Responses from interviews will be analyzed thematically to identify key themes and patterns in teachers' perceptions and challenges.

OBJECTIVES-1: To study awareness regarding Artificial Intelligence among secondary school

Table 1 Awareness regarding Artificial Intelligence among secondary schools

Variable	N	Mean	SD	T value	P value	Significant @0.05 levels
Government Secondary school teachers	200	3.85	0.80	2.21	0.028*	
Private Secondary school teachers	200	4.05	0.78			

Table no 1 is comparing the awareness of artificial intelligence between government and private school teachers. The data analysis revealed a statistically significant difference in AI awareness between the two groups. Government school teachers had a mean awareness score of 3.85 with a standard deviation of 0.80 and private school teachers had a mean awareness score of 4.05 with a standard deviation of 0.78. The t-test calculated 2.21 and p-value is 0.028, indicating

that the difference in AI awareness is statistically significant. Therefore the private school teachers showed higher AI awareness than government school teachers.

OBJECTIVE- 2: To compare the awareness of Artificial Intelligence between English and Kannada medium secondary school Teachers

Table.2 Awareness of Artificial Intelligence in English and Kannada medium Teachers.

Variables	N	M	SD	t-value	p-value	Significant
English medium school teachers	200	4.05	0.78	2.10	0.036*	@0.05 levels
Kannada medium school teachers	200	3.85	0.82			

Table No 2 revels that the English medium teachers have a higher mean Artificial Intelligence awareness score compared to Kannada medium teachers. The standard deviation for both groups is similar for English, for Kannada, indicating consistent awareness within each group. The t-test was performed to test the statistical significance of the difference. The t-value is and the p-value is indicating that the difference in AI awareness between the two groups is statistically significant the analysis shows that English medium teachers exhibit significantly higher AI awareness than Kannada medium teachers, with a moderate statistical difference.

OBJECTIVE-3: To examine the differences in Artificial Intelligence awareness between male and female secondary school teachers

Table 3 Artificial Intelligence awareness between male and female secondary school teachers

Group	N	Mean	SD	T value	P value	Significant
Male Teachers	200	3.95	0.82	-1.65	0.099	@0.05 levels
Female Teachers	200	4.05	0.75			

Table no 3 revels that the comparison of Artificial Intelligence awareness between male and female teachers showed a slight difference in their mean awareness scores. Male teachers had a slightly higher mean score than the female teachers. The variability in AI awareness within each group was similar, with male teachers having a standard deviation of 0.82 and female teachers having 0.75. However, the analysis revealed that the difference in AI awareness between the two groups was not statistically significant. The both groups showed comparable levels of awareness, and the slight difference in means does not indicate a meaningful disparity in their awareness of AI.

OBJECTIVE-4: To analyze the differences in Artificial Intelligence awareness among urban and rural secondary school teachers

Table 3 Artificial Intelligence awareness among urban and rural secondary school teachers

Group	N	Mean	SD	T value	P value	Significant
Urban	200	4.10	0.80	3.20	0.002*	@0.05 levels
Rural	200	3.85	0.85			

The table no 4 revels the Urban Teachers have a higher average Artificial Intelligence awareness compared to rural teachers. The t-test results (t=3.20, p=0.002) show that the difference in AI awareness between the two groups is statistically significant. This indicates that urban teachers are significantly more aware of AI than rural teachers, likely due to better access to resources and training.

OBJECTIVE-5 To compare the awareness of Artificial Intelligence between science and arts teachers in secondary schools

Table 5 Artificial Intelligence between science and arts teachers in secondary schools

Group	N	M	SD	t-value	p-value	Significant
Science	100	5.15	0.76	2.35	0.021	@0.05 levels
Arts	100	3.90	0.80			

Table no 5 revels that the science teachers have significantly higher Artificial Intelligence awareness compared to arts teachers. The difference between the two groups is statistically significant, as indicated by the t-test results (t = 2.35, p = 0.021). This suggests that science teachers are more aware of Artificial Intelligence than arts teachers.

8. RESEARCH FINDINGS:

1 The Private school teachers demonstrated higher awareness of artificial intelligence compared to government school teachers. The statistical analysis revealed a significant difference that private school teachers are more knowledgeable about AI. To bridge the gap in AI awareness, government schools could benefit from targeted professional development and AI training programs.
2 Teachers in English medium schools showed higher Artificial Intelligence awareness compared to those in Kannada medium schools. The statistical test revealed a significant difference, suggesting that teachers in English medium schools have a better understanding of Artificial Intelligence. The difference in Artificial Intelligence awareness may be attributed to greater access to resources and training opportunities in English medium schools.
3 A small difference in Artificial Intelligence awareness was observed between male and female teachers. However, the statistical analysis indicated that this difference is not statistically significant, suggesting similar levels of Artificial Intelligence awareness across genders. There is no significant gender-based disparity in Artificial Intelligence awareness among secondary school teachers.
4 The Urban teachers exhibited higher Artificial Intelligence awareness compared to rural. The t-test results confirmed that the difference is statistically significant, with urban teachers being more knowledgeable about Artificial Intelligence. The disparity in Artificial Intelligence awareness is likely due to differences in access to technology, training, and resources between urban and rural areas.
5 The Science teachers had significantly higher Artificial Intelligence awareness than arts teachers. The t-test results confirmed that the difference is statistically significant, indicating that science teachers are more likely to be aware of Artificial Intelligence. This difference may stem from the nature of the subjects, as science curricula often incorporate more technology and Artificial Intelligence related content.

9. EDUCATIONAL IMPLICATIONS:

1 The significant difference in Artificial Intelligence awareness between private school teachers and government school teachers highlights the need for professional development initiatives in government schools. Schools should invest in Artificial Intelligence focused training programs to ensure that teachers in these schools are equipped with the necessary skills and knowledge. To reduce the gap in Artificial Intelligence awareness, government schools should collaborate with educational technology providers and Artificial Intelligence experts to offer targeted workshops and training sessions for teachers.
2 The finding that English medium teachers exhibit higher Artificial Intelligence awareness suggests that language may play a role in access to educational resources and training. The medium of instruction affects the availability of Artificial Intelligence related content and training, with English based resources being more accessible. The education authorities should consider integrating Artificial Intelligence into the curriculum for all mediums of instruction and ensure that Kannada medium teachers receive equal access to Artificial Intelligence training materials and resources. Additionally, schools could develop Artificial Intelligence modules in regional languages to promote inclusivity.
3 The study revealed no significant gender difference in Artificial Intelligence awareness, suggesting that both male and female teachers are equally aware of Artificial Intelligence. The schools and educational policymakers should continue to support gender equality in stem education and ensure that both male and female teachers have access to the same Artificial Intelligence resources and training opportunities.
4 The disparity in Artificial Intelligence awareness between urban and rural teachers indicates that urban areas have more access to resources, professional development, and Artificial Intelligence related training. The rural schools should be prioritized for Artificial Intelligence focused professional development programs, and efforts should be made to provide equal access to technology and training for rural teachers. Bridging this gap can enhance the quality of education in rural areas and ensure equitable educational opportunities for all teachers.
5 The study shows that science teachers exhibit significantly higher Artificial Intelligence awareness than arts teachers. This may be because science subjects typically involve more technology and Artificial Intelligence integration. The ensure arts teachers are equally aware of Artificial Intelligence, educational authorities could develop subject-specific Artificial Intelligence modules that are relevant to both science and arts disciplines. Incorporating Artificial Intelligence education into the arts curriculum would ensure a balanced approach to technology integration across all subjects.
6 The findings suggest that targeted interventions are necessary to address the specific needs of different groups of teachers. For instance, Artificial Intelligence training programs for government school teachers, arts teachers, and rural teachers could be developed to address their particular challenges and help them enhance their Artificial Intelligence awareness. The schools and educational policymakers should tailor their Artificial

Intelligence training programs to meet the distinct needs of teachers, based on factors like school type, location, subject, and medium of instruction, to maximize effectiveness.

10. LIMITATIONS :

The study underscores significant disparities in Artificial Intelligence awareness among secondary school teachers, influenced by school type, location, subject specialization, and medium of instruction. Targeted professional development programs, curriculum enhancements, and equitable access to Artificial Intelligence resources are essential to bridge these gaps. Addressing these disparities will ensure inclusive and effective Artificial Intelligence integration in education.

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