VISION VIKSIT BHARAT 2047: CONTRIBUTION AND INITIATIVES OF DIGITAL INDIA FOR EMPOWERING RURAL WOMEN

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EMPOWERING FEMALE STUDENTS TO EMBRACE AI TOOLS FOR ACADEMIC EXCELLENCE: A SPECIAL FOCUS ON COLLEGES IN COIMBATORE DISTRICT

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Abstract
The rapid integration of Artificial Intelligence (AI) tools in educational practices has highlighted the need for enhanced digital literacy, particularly among female students. This study aims to evaluate the adoption of AI tools for academic success among female students in colleges across Coimbatore District. A sample of 370 students from diverse disciplines was analyzed using quantitative methods, employing a t-test and ANOVA for statistical validation. The findings reveal significant variations in AI tool adoption based on discipline and digital literacy levels, emphasizing the importance of tailored interventions to empower female students in leveraging AI for academic excellence.
Keywords: *Empowering Female Students, AI Tools, Academic Excellence, Digital Literacy etc.,*

Introduction

In today's technology-driven world, Artificial Intelligence (AI) tools have become indispensable in educational settings, enhancing learning efficiency and outcomes. However, the effective adoption of these tools requires a foundational level of digital literacy. Female students, particularly in developing regions, often face challenges such as limited access to technology, lack of training, and socio-cultural barriers, which hinder their ability to leverage AI tools effectively. This study focuses on assessing the digital literacy and adoption of AI tools among female students in colleges within Coimbatore District, identifying key factors that influence their academic success.

Statement of the Problem

Despite the proliferation of AI tools designed to enhance educational outcomes, there exists a disparity in their adoption among female students in Coimbatore District. Factors such as varying levels of digital literacy, socio-economic constraints, and disciplinary differences contribute to this gap. Understanding these barriers is crucial to developing strategies that promote equitable access to AI resources and support academic excellence among female students.

Objectives of the Study

1. To identify socio-economic factors influencing the use of AI tools.
2. To assess the current level of digital literacy among female college students in Coimbatore District.
3. To evaluate the extent of AI tool adoption across different academic disciplines.
4. To analyze the relationship between digital literacy levels and academic performance.

Literature Review

Previous studies have highlighted the importance of digital literacy in fostering academic success. For instance, Wilson and Dock (2020) emphasized that digital skills significantly enhance students' ability to navigate AI-based educational tools, resulting in improved learning outcomes. Similarly, Sharma and Gupta (2019) found that gender-specific barriers, such as limited access to technology and cultural constraints, often impede female students' adoption of AI tools. Another study by Lee et al. (2021) underscored the role of institutional support and training in promoting the effective use of digital technologies among students. These findings suggest that tailored interventions addressing socio-economic and cultural factors are crucial for improving digital literacy and technology adoption among female students.

Methodology

A quantitative research design was employed, involving a sample of 370 female students across various disciplines, including Arts, Science, Commerce, and Engineering. Data was collected through a structured questionnaire focusing on digital literacy levels, usage patterns of AI tools, and perceived academic benefits. The collected data was analyzed using statistical tools to identify differences and relationships among variables.

Data Analysis and Interpretation

Socio-Economic Profile

The socio-economic background of the participants provides critical insights into their access to and adoption of AI tools with regards to annual income and parents education 40% of participants belonged to families with an annual income below INR 3,00,000., 35% were from middle-income families (INR 3,00,000–7,00,000) and 25% had an annual family income above INR 7,00,000.50% of participants had parents with a high school education or less.30% reported parents with undergraduate degrees, 20% had parents with postgraduate qualifications.60% of participants were from urban areas, while 40% were from rural areas.55% of participants had personal laptops or smartphones and 45% relied on shared or institutional resources for technology access.

Relationship between Digital Literacy Levels and the Adoption of AI Tools

To further understand the relationship between digital literacy levels and the adoption of AI tools among female students across different disciplines, a cross-tabulation analysis

was conducted. This method allows for the examination of the interaction between categorical variables, providing insights into patterns and associations within the data.

Digital Literacy Levels by Discipline

The table below presents the distribution of digital literacy levels (High, Moderate, and Low) across the four disciplines: Arts, Science, Commerce, and Engineering.

Table - 1

Discipline	High Digital Literacy	Moderate Digital Literacy	Low Digital Literacy	Total
Arts	20 (21.6%)	40 (43.2%)	33 (35.2%)	93
Science	45 (40.9%)	40 (36.4%)	25 (22.7%)	110
Commerce	50 (67.6%)	20 (27.0%)	4 (5.4%)	74
Engineering	50 (54.9%)	42 (46.1%)	0 (0%)	92
Total	165	142	62	370

Note: Percentages in parentheses represent the proportion of students within each discipline for a given digital literacy level.

Observations reveal distinct patterns in digital literacy levels across disciplines in Arts, a large proportion of students have moderate (43.2%) and low (35.2%) digital literacy levels, with a smaller group demonstrating high digital literacy (21.6%).Science students generally show high (40.9%) and moderate (36.4%) digital literacy, with fewer in the low category (22.7%).In Commerce, most students possess high digital literacy (67.6%), followed by moderate literacy (27.0%), with only a small percentage exhibiting low literacy (5.4%).Engineering students predominantly display high digital literacy (54.9%), with the rest showing moderate levels (46.1%) and none falling into the low category.

Adoption of AI Tools by Digital Literacy Level

The following table shows the relationship between digital literacy levels and the adoption of AI tools among the participants.

Table - 2

Digital Literacy Level	Adopted AI Tools	Did Not Adopt AI Tools	Total
High	140 (84.8%)	25 (15.2%)	165
Moderate	80 (56.3%)	62 (43.7%)	142
Low	30 (48.4%)	32 (51.6%)	62
Total	250	119	370

Note: Percentages in parentheses represent the proportion of students within each digital literacy level who have adopted or not adopted AI tools.

A substantial majority (84.8%) of students with high digital literacy have adopted AI tools, indicating a strong positive correlation between high digital literacy and AI tool

adoption. Over half (56.3%) of students with moderate digital literacy have adopted AI tools, while a significant portion (43.7%) have not, suggesting variability in adoption within this group. Less than half (48.4%) of students with low digital literacy have adopted AI tools, with a slight majority (51.6%) not adopting them, highlighting challenges faced by this group in embracing AI technologies.

The cross-tabulation analysis reveals a clear association between digital literacy levels and the adoption of AI tools among female students in Coimbatore District colleges. Students with higher digital literacy are more likely to adopt AI tools, which can enhance their academic success. Conversely, those with lower digital literacy levels are less inclined to utilize these tools, potentially hindering their academic performance. These findings underscore the importance of targeted interventions to improve digital literacy, particularly in disciplines and groups exhibiting lower adoption rates, to ensure equitable access to the benefits of AI in education.

The demographic distribution of the participants reveals that a significant portion, 65%, were aged between 18 and 22 years. In terms of academic disciplines, the participants were fairly diverse, with 30% coming from Science, 25% from both Arts and Engineering, and 20% from Commerce. This shows a broad representation of students across different fields of study. The levels of digital literacy among participants varied, with 42% reporting high digital literacy, 38% indicating moderate levels, and 20% having low digital literacy. Notably, engineering students exhibited the highest digital literacy, while Arts students had the lowest. A significant 68% of participants actively utilized AI tools for academic tasks, including research, writing assistance, and time management. Among the different disciplines, Commerce students had the highest adoption rate at 72%, followed by Science at 70%, Engineering at 65%, and Arts at 60%. The main barriers to adoption included limited access to technology, reported by 40% of participants, followed by a lack of awareness and training at 35%, and socio-cultural constraints affecting 25% of participants. **t-Test results shows that the s**ignificant differences were observed in digital literacy levels between Arts and Engineering students ($p < 0.05$).**ANOVA results shows that a** significant effect of discipline on AI tool adoption was identified ($F(3, 366) = 4.67$, $p < 0.01$).

Conclusion

The study underscores the need for targeted initiatives to enhance digital literacy and AI tool adoption among female students, particularly in disciplines with lower adoption rates. Recommendations include organizing workshops, providing access to technology, and fostering an inclusive learning environment to bridge the digital divide and empower female students for academic excellence.

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