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Professors' Perspectives on the Adoption of Artificial Intelligence in Arts and Science Colleges: Challenges and Opportunities in Coimbatore District

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ABSTRACT

The use of Artificial Intelligence (AI) in higher education is changing how teaching, learning and institutions operate. This study looks at how professors from Arts and Science Colleges in Coimbatore District see the benefits and difficulties of using AI in teaching, learning and research. The study used a quantitative approach, collecting data through interviews with 100 faculty members and surveys sent to professors in various fields like arts, humanities, life sciences, physical sciences and commerce. The results show that professors see many benefits of AI, such as helping students learn more effectively, making assessments easier, supporting decisions based on data, encouraging teamwork across different subjects and preparing students for future jobs. However, there are also several problems. These include not having enough equipment, reliable internet and proper software, lack of digital skills among teachers and students, worries about ethics and cheating, resistance to change and not enough support from the institution in terms of rules, training and money. Also, different subjects had different views: science teachers were more positive about AI's use, while arts and humanities teachers were more worried about how AI might affect creativity, original ideas and cultural understanding. The study used a descriptive research method with a non-probability sampling approach, specifically purposive sampling. The researcher chose professors based on purposeful selection and used an interview schedule to get information from 100 professors.

KEYWORDS: *Professors' Perspectives, Artificial Intelligence, Challenges and Opportunities.*

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INTRODUCTION

In recent years, Artificial Intelligence (AI) has become one of the biggest changes in education. It is being used in universities to change how teachers teach, how students learn and how schools manage their work. Around the world, AI is being used more and more in things like smart tutoring systems, automatic grading, analyzing student data and virtual classrooms. However, how quickly and how people see AI being used varies a lot depending on where they are, what subject they study and what kind of school they go to. In India, especially in Arts and Science Colleges, using AI in education is still in the early stages, with people feeling both excited and worried about it. Coimbatore District, which has many educational institutions and a strong focus on learning, is a good place to look at how ready teachers are to use AI. Teachers in these colleges are important because they decide how well AI can be used in planning courses, teaching classes, doing research and making decisions in the school. It's important to understand what teachers think because it helps find what makes AI adoption easier and what stops it from happening. AI has many benefits like helping students learn better, making learning more interesting, managing information more efficiently and helping make better decisions. But it also brings

challenges like not having enough knowledge about technology, worrying about ethics, being afraid of losing jobs and not having good school resources. These problems show that there needs to be a smart way to use AI that helps both with technology and keeps the focus on teaching and learning.

DEFINITION

Definition of Artificial Intelligence

Artificial Intelligence (AI) refers to the simulation of human intelligence processes by machines, especially computer systems. It involves the ability of machines to perform tasks that typically require human intelligence, such as reasoning, problem-solving, learning, perception and decision-making. According to John McCarthy (2014), one of the pioneers of AI, it is defined as "the science and engineering of making intelligent machines." AI systems use algorithms, data analytics and machine learning techniques to process information, recognize patterns and make predictions or recommendations.

Challenges of Artificial Intelligence

1. **Lack of Technical Expertise:** Many faculty members lack adequate knowledge and training to effectively use AI tools in teaching and research.
2. **Infrastructure Limitations:** Limited access to high-speed internet, digital tools and computational resources hinders AI implementation.
3. **Ethical and Privacy Concerns:** Issues related to data privacy, algorithmic bias and academic integrity pose serious ethical challenges.
4. **Resistance to Change:** Traditional teaching methods and fear of technology replacing human roles often create reluctance among educators.
5. **High Cost of Implementation:** The installation and maintenance of AI-based systems require significant financial investment.
6. **Policy and Regulation Gaps:** Absence of clear institutional or governmental policies on AI integration slows down adoption.

Opportunities of Artificial Intelligence

1. **Personalized Learning:** AI enables customized learning experiences that adapt to individual student needs and pace.
2. **Enhanced Teaching Efficiency:** Automating administrative tasks allows professors to focus more on creative and interactive teaching.
3. **Data-Driven Insights:** AI analytics help track student performance, predict learning difficulties and design targeted interventions.
4. **Innovation in Research:** AI tools facilitate data analysis, simulation and academic writing assistance, enhancing research productivity.
5. **Improved Accessibility:** AI-driven platforms support students with disabilities through speech recognition, translation and adaptive technologies.
6. **Skill Development:** Exposure to AI applications prepares students for future careers in technology-driven industries.
7. **Collaborative Learning:** AI promotes interdisciplinary collaboration by connecting students and faculty across domains.

STATEMENT OF THE PROBLEM

The fast progress of Artificial Intelligence (AI) has brought big changes to higher education, affecting how teachers teach, how research is done and how colleges are run. Around the world, AI is being used in schools and universities to make things more efficient, help students learn in a personalized way and encourage new ideas. However, in India, especially in Arts and Science Colleges, the use of AI is still in the beginning stages and many teachers are unsure or hesitant about adopting it. In Coimbatore District, which is a major center for education in Tamil Nadu, many Arts and Science Colleges are trying to catch up with global tech trends. Even though there are digital tools and efforts from institutions, there's a big difference between knowing about AI and actually using it in teaching. Teachers, who are important for designing courses and sharing knowledge, have different views on whether AI is useful, practical and ethical in education.

SCOPE OF THE STUDY:

The present study focuses on exploring the perspectives of professors regarding the adoption and implementation of Artificial Intelligence (AI) in Arts and Science Colleges within the Coimbatore District. The scope of the research extends to examining both the challenges and opportunities associated with AI integration in the academic and administrative domains of higher education institutions. The study primarily covers faculty members from various disciplines such as arts, humanities, commerce, management and science streams. It aims to understand their level of awareness, attitudes, and readiness to incorporate AI technologies into teaching, learning and research activities. The research also analyzes institutional support mechanisms, including availability of infrastructure, training programs and policy initiatives that influence the adoption of AI in college environments. Geographically, the scope is confined to Arts and Science Colleges located in Coimbatore District,

Tamil Nadu, which is known for its diverse range of higher education institutions. The study seeks to provide localized insights that may also serve as a reference for other districts and regions in India planning to implement AI-driven educational strategies.

REVIEW OF LITERATURE

1. Kumar, R., & Thomas, L. (2022). The study explored faculty readiness and attitudes toward integrating AI tools in teaching and administration. The findings revealed that while professors recognized the potential of AI to enhance student learning outcomes and research efficiency, their actual usage remained limited due to inadequate institutional support and lack of training. The study highlighted the need for professional development programs and institutional policies to strengthen AI literacy among educators. Sampling Method: Stratified random sampling. Sample Size: 120 faculty members from Arts and Science colleges in Tamil Nadu.

2. Meenakshi, P., & Rao, S. (2021). This research analyzed faculty perspectives on AI adoption in higher education and identified key challenges, including inadequate infrastructure, ethical dilemmas and fear of job displacement. Despite these challenges, respondents viewed AI as a powerful tool for fostering personalized learning and reducing administrative burdens. The study emphasized that successful implementation depends on institutional vision, resource allocation and continuous faculty engagement. Sampling Method: Convenience sampling Sample Size: 150 college professors from Arts, Science and Commerce streams across five Indian states.

3. Singh, A., & Priya, D. (2023). The study examined the perceptions of professors toward the use of AI-based applications such as virtual teaching assistants, adaptive learning platforms and automated grading tools. Results showed that most faculty members perceived AI as an opportunity to improve instructional quality and student engagement. However, technical skill gaps, data privacy issues and lack of institutional incentives were identified as major barriers. The authors suggested developing AI integration frameworks tailored to local academic contexts. **Sampling Method:** Purposive sampling. **Sample Size:** 100 faculty members from urban Arts and Science colleges in Coimbatore and Chennai districts.

Methodology of the Study

Objectives of the Study

- To study the personal profile of the respondents.
- To access the level of adoption of artificial intelligence in challenges and opportunities of the professors.
- To discover the association between personal profile and adoption of artificial intelligence in challenges and opportunities of the professors.
- To assess the difference between personal profile and adoption of artificial intelligence in challenges and opportunities of the professors.
- To study the influence of adoption of artificial intelligence in challenges and opportunities of the professors.

Research Design: The present study is descriptive in nature, aiming to examine and describe the personal profiles of professors and their perspectives on the adoption of Artificial Intelligence, including the associated challenges and opportunities in Arts and Science colleges.

Universe of the Study: The universe of the study comprises college professors in Coimbatore District**.** From this population, the researcher selected a total of 100 respondents to constitute the study sample.

Sampling: A non-probability sampling method was adopted for the study. Specifically, purposive random sampling was employed to identify and select respondents who met the criteria relevant to the study objectives. Using this method, 100 professors from Arts and Science colleges in Coimbatore were selected as the sample for data collection.

Tools for Data Collection: Data were collected using a self-structured questionnaire designed to assess the professors' perspectives on the adoption of Artificial Intelligence, its challenges and opportunities**.**

Data Analysis: The collected data were analyzed using various statistical tools, including simple percentage analysis**,** independent t-test and ANOVA**,** to interpret the findings and derive meaningful conclusions regarding the adoption of AI in higher education.

Finds of the Study

Factors	MEDIUM	FREQUENCY	PERCENT
Age	25yrs-35yrs	72	72%
Gender	Female	75	75%
Marital Status	Married	66	66%
No. of Dependents	1-2	64	64%
Locality	Semi urban	76	76%
Socio Economic Background	Upper –middle	62	62%
Educational Qualification	Ph.D	66	66%
Status	Assistant Professor	70	70%
Monthly Income (in Rs.)	Rs.25000- Rs.35000	61	61%
Year of experience	10yr-15years	62	62%

Simple Percentage Analysis

- Majority (72%) of the respondents is in the age group between 25-35 years.
- Majority (75%) of the respondents have female.
- Majority (66%) of the respondents have married.
- Nearly (64%) of the respondents have numbers of dependents of 1-2.
- More than (76%) of the respondents have locality of semi urban.
- Majority (62%) of the respondents have socio economic background of upper middle.
- Majority (66%) of the respondents have Ph.D of educational qualification.
- Majority (70%) of the respondents have status of assistant professor works.
- Majority (68.3%) of the respondents have monthly income of Rs.25000-Rs.35000.
- Majority (70%) of the respondents have 10yrs -15yrars experience.

DISTRIBUTION OF THE RESPONDENTS BY LEVEL OF ADOPTION OF ARTIFICIAL INTELLIGENCE IN CHALLENGES AND OPPORTUNITIES

S. No	Adoption of artificial intelligence in challenges and opportunities	Number of Respondents	Percentage %
1	High	25	25
2	Moderate	65	65
3	Low	10	10
TOTAL		**100**	**100**

INTERPRETATION

The above table highlights the Adoption of artificial intelligence in challenges and opportunities level of the respondents. It is understood from the above table that 65 percent of the respondents have moderate level of Adoption of artificial intelligence in challenges and opportunities, 25 percent of the respondents have high level of Adoption of artificial intelligence in challenges and opportunities and 10 percent of the respondents have a low level of Adoption of artificial intelligence in challenges and opportunities.

Influence of personal profile and Level of Adoption of artificial intelligence in challenges and opportunities

Variables	Statistical tool	Value	Result
Age and Adoption of artificial intelligence in challenges and opportunities	Chi-Square	6.605(a) (P=.000 < .026)	Significant
Gender and Adoption of artificial intelligence in challenges and opportunities	Chi-Square	1.754 (a) (P=.000 > .507)	Not Significant
Marital Status and Adoption of artificial intelligence in challenges and opportunities	t-test	t=7.295 P = .010< 0.05	Significant
No. of Dependents and Adoption of artificial intelligence in challenges and opportunities	t-test	t=4.205 P = .000< 0.05	Significant
Locality and Adoption of artificial intelligence in challenges and opportunities	t-test	t=8.295 P = .003< 0.05	Significant
Socio Economic Background and Adoption of artificial intelligence in challenges and opportunities	ANOVA	F=7.115 P = .020< 0.05	Significant

Educational Qualification and Adoption of artificial intelligence in challenges and opportunities	ANOVA	F= .546 P = .225> 0.05	Not-Significant
Status and Adoption of artificial intelligence in challenges and opportunities	ANOVA	F=7.295 P = .002< 0.05	Significant
Monthly Income (in Rs.) and Adoption of artificial intelligence in challenges and opportunities	ANOVA	F= .406 P = .324> 0.05	Not-Significant
Year of experience and Adoption of artificial intelligence in challenges and opportunities	ANOVA	F= 9.192 P = .000< 0.05	Significant

- There is a significant association between Age and the level of Adoption of artificial intelligence in challenges and opportunities.
- There is a no significant association between gender and the level of Adoption of artificial intelligence in challenges and opportunities.
- There is significant difference in the marital status and the level of Adoption of artificial intelligence in challenges and opportunities.
- There is significant difference in the number of dependents and the level of Adoption of artificial intelligence in challenges and opportunities.
- There is significant difference in the locality and the level of Adoption of artificial intelligence in challenges and opportunities.
- There is significant difference in the socio economic background and the level of Adoption of artificial intelligence in challenges and opportunities.
- There is no significant difference in the education and the level of Adoption of artificial intelligence in challenges and opportunities.
- There is significant no difference in the occupation and the level of Adoption of artificial intelligence in challenges and opportunities.
- There is no significant difference in the monthly income and the level of Adoption of artificial intelligence in challenges and opportunities.
- There is significant no difference in the year of experience and the level of Adoption of artificial intelligence in challenges and opportunities.

Recommendations

- Regular workshops, seminars and certification courses should be organized to enhance professors' understanding of Artificial Intelligence tools, applications and ethical use in education.
- Colleges should develop clear institutional policies and guidelines for AI adoption, addressing data privacy, academic integrity and responsible usage to ensure ethical implementation.
- Educational institutions must invest in upgrading digital infrastructure, including high-speed internet, AI-enabled software and computing facilities to support technology-based learning and research.
- Encourage collaboration between faculty from different disciplines to explore innovative applications of AI in arts, sciences and commerce, promoting interdisciplinary learning.
- Incorporate AI-related topics, case studies and digital literacy modules into the curriculum to familiarize students and faculty with emerging technological trends.
- Establish partnerships with technology firms and research organizations to provide hands-on exposure, internships and collaborative research opportunities related to AI applications in education.
- Implement periodic reviews and feedback systems to assess the effectiveness of AI integration and identify areas that need improvement or additional support.
- Seek grants and financial assistance from government bodies, universities and private organizations to fund AI-based academic initiatives and infrastructure development.
- Ensure that AI tools are used responsibly, avoiding bias or misuse and make them accessible to all students regardless of their background or digital proficiency.

- Foster a culture of innovation and experimentation among faculty and students by encouraging research, pilot projects and creative use of AI in teaching and learning.

CONCLUSION

The use of Artificial Intelligence (AI) in higher education is changing how knowledge is given, learned and handled. This study titled "Perspectives on the Adoption of Artificial Intelligence in Arts and Science Colleges: Challenges and Opportunities in Coimbatore District," shows that even though AI has a lot of potential to improve education, its use is not the same everywhere and depends on many factors within institutions and among people. The study finds that teachers in Arts and Science colleges mostly see the benefits of AI, like making teaching more efficient, helping students learn in a personalized way, improving research results and making administrative tasks easier. However, the study also finds some problems, such as not enough digital tools, lack of training, worries about ethics and concern about how AI might affect traditional teaching methods and jobs. It's clear that using AI effectively requires a good mix of new technology and the ability of people to adapt. Schools need to keep offering training for teachers, put money into better technology and make sure there are clear rules about how AI should be used. Supporting teamwork between different areas, encouraging creativity and innovation and making good policies will help make sure that using AI in education supports the goals of fairness, creativity and thinking critically.

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