

HARNESSING AI FOR INCLUSIVE EDUCATION: ADDRESSING GENDER AND AGE-RELATED DIFFERENCES IN TEACHER ATTITUDES

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Abstract

This study delves into the effective integration of Artificial Intelligence (AI) in higher education, examining its impacts, opportunities, and challenges. The research focuses on higher education institutions in Thiruvananthapuram, Kerala, using structured questionnaires to collect data on teachers' perceptions. Statistical methods, including One-Sample T-Test, Independent T-Test, and ANOVA, were applied to analyze the data. Teachers have a remarkably positive perception of AI in learning, viewing it as a valuable tool that promotes academic integrity, creativity, and student-teacher connections. Significant gender and age-related differences exist, with male and younger teachers exhibiting more favorable attitudes. The study highlights the need for targeted measures to encourage female teachers' acceptance and address potential generational shifts in technology adoption, ensuring inclusive and effective AI integration in education. This research provides significant insights for educators and comprehensive knowledge for developing educational models that promote future growth, contributing to the emerging field of Artificial Intelligence in Education.

Keywords:- Artificial Intelligence, Higher Education, Technology, Teaching, Student Attributes

The future of higher education is inherently connected to the evolution of new technologies and the computational power of contemporary intelligent machines. In this arena, advancements in artificial intelligence

create new opportunities and challenges for teaching and learning in higher education, with the potential to radical transform governance and the internal organization of higher education institutions.

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The future of higher education is inherently connected to the evolution of new technologies and the computational power of contemporary intelligent machines. In this arena, advancements in artificial intelligence create new opportunities and challenges for teaching and learning in higher education, with the potential to radically transform governance and the internal organization of higher education institutions. It is a commonly acknowledged fact that higher education is significantly reliant on human and manual labor. Given its labor-intensive framework, higher education institutions are compelled to allocate a substantial budget for hiring and retaining educators, as well as for data processing within their establishments. As a result, being a labor-sensitive field, it is facing both financial and physical losses. Thus, the adoption of artificial intelligence will offer a more economical and responsive approach to the higher education sector. Artificial intelligence (AI) is an automated systems that can engage in human-like processes, such as learning, adapting, synthesizing, self-correcting, and employing data for complex processing tasks.

2. Artificial Intelligence

Artificial intelligence (AI) refers to machines mimicking human cognitive functions like speech recognition, language translation, and decision-making. AI is a key component in various fields and is present in daily life, from sensors to personal assistants. Recent innovations have transformed higher education. AI can improve the world but also raises concerns. For example, driverless cars bring benefits like reduced accidents and

increased efficiency, but may replace human drivers, impacting jobs. AI is rapidly advancing and transforming higher education, with universities using tools like IBM's Watson super computer to offer 24/7 student support. This shifts administrative tasks, impacting workforce structure and service quality.

3. Issues Confronting Artificial Intelligence in the Field of Education

Significant obstacles for artificial intelligence in education involve the implementation of virtual coaches tailored for each student. It consolidates vast amounts of information regarding individual learning, social contexts, learning environments, and personal interests, enhancing the interconnectedness and accessibility of classrooms globally, while extending learning beyond the classroom and into students' lives outside of school. Nevertheless, there are certain challenges that higher education institutions may face when they adopt artificial intelligence in their universities. The adoption of AI in higher education is hindered by limitations such as authorization, economic support, and evolving privacy regulations. To overcome these challenges, institutions must strategically consider the timing and scope of AI implementation, prioritize student privacy protection, and define clear success criteria.

4. Literature Review

As Artificial Intelligence (AI) increasingly permeates everyday life, developing AI literacy among non-experts is crucial, particularly in higher and adult education, to enable effective interaction

with the technology (Laupichler et al., 2022). Current research on AI literacy is still in its early stages, requiring refinement in defining AI literacy and identifying relevant content for non-experts, with the review highlighting the need for more focused studies to inform educational practices and policies. The rapid infiltration of Artificial Intelligence (AI) agents into various industries has sparked research interest in user acceptance, yet existing studies lack systematic synthesis, hindering a comprehensive understanding of AI adoption (Kelly et al., 2023). Key factors influencing AI acceptance include perceived usefulness, performance expectancy, attitudes, trust, and effort expectancy, although cultural nuances and the need for human contact may moderate these effects, highlighting the need for further research using naturalistic methods to validate theoretical models. The integration of Artificial Intelligence (AI) in daily life has made it essential to develop AI literacy, which will be crucial for future careers in science and engineering, much like classic literacy (Kandlhofer et al., 2016).

The integration of Artificial Intelligence (AI) and social robots in education is transforming the role of teachers, shifting their responsibilities towards designing and overseeing machine-led instruction, monitoring student progress, and providing support (Edwards et al., 2018). Effective integration of Artificial Intelligence in education requires teachers to possess specific technological and pedagogical knowledge, as well as the ability to assess AI-based decisions ethically (Celik, 2023). Research has shown that teachers' technological knowledge is crucial for

understanding AI's pedagogical contributions, but it must be combined with pedagogical knowledge to achieve efficient AI integration, leading to the proposal of the intelligent framework. Artificial Intelligence (AI) has been touting its potential to revolutionize teaching and learning in education, offering opportunities such as personalized learning, enhanced student motivation, and improved teaching efficiency (Holmes et al., 2023). However, the integration of AI in education also poses significant challenges, including teacher resistance, high implementation costs, ethical concerns, and the need for extensive teacher training, highlighting the need for careful planning and policy development to effectively leverage AI in educational settings.

5. Scope of the Study

The scope of this study encompasses exploring teachers' perceptions and attitudes towards the integration of Artificial Intelligence (AI) in higher education, specifically within Thiruvananthapuram, Kerala. It investigates the potential impacts, opportunities, and challenges associated with AI adoption in teaching and learning. The research focuses on identifying significant differences in perceptions based on gender and age, informing strategies for inclusive AI integration. Additionally, the study aims to contribute valuable insights to the emerging field of Artificial Intelligence in Education, guiding the development of effective educational models. Ultimately, the scope of this research is to provide a deeper understanding of AI's role in shaping the future of higher education.

6. Significance of the Study

AI is a tool that offers flexibility, collaboration, and control, benefiting both learners and teachers. The digital era has transformed education, offering limitless opportunities for training and learning. AI has become integral to academic settings, bringing numerous benefits for teachers and students alike. In higher education, AI-powered programs cater to diverse fields and courses, filling gaps in traditional teaching methods. The significance of this study lies in its exploration of teachers' perceptions towards AI integration in higher education, providing valuable insights for educators and policymakers. By highlighting the opportunities and challenges associated with AI adoption, the research informs strategies for effective implementation and inclusive growth. The study's focus on gender and age-related differences adds a critical dimension, enabling targeted interventions to promote diversity and equity in AI-driven education. Furthermore, the research contributes to the emerging field of Artificial Intelligence in Education, shaping the development of innovative and adaptive learning models. Ultimately, the study's findings have the potential to enhance teaching and learning outcomes, preparing students for an increasingly AI-driven world.

7. Statement of the Problem

Despite the growing presence of Artificial Intelligence (AI) in education, there is a need to understand teachers' perceptions towards its integration in learning, and how these perceptions align with general expectations. Specifically, it is essential to investigate whether teachers'

views on AI's impact on academic integrity, creativity, empathy, and their own roles differ across gender and age groups, in order to inform strategies for effective and inclusive AI adoption in higher education. This statement of the problem is based on the objectives of the study, which aim to examine teachers' perceptions towards AI in learning and compare them with general expectations and to investigate gender-based and age-based differences in perceptions towards AI in learning across various aspects.

8. Objectives of the Study

- To examine teachers' perceptions towards artificial intelligence in learning and compare them with general expectations.
- To investigate gender-based and age based differences in perceptions towards artificial intelligence in learning across various aspects, including: Integrity in Academics: Cheating and Copying, Nurturing Original Thought and Innovation, Empathy and Personal Connection in Learning, Educators' Role and Employment Stability, Safeguarding Information: Confidentiality and Protection.

9. Research Methodology

This study focused on higher education institutions located in Thiruvananthapuram, Kerala. Structured questionnaires were created, and data were collected from 80 respondents, emphasizing teachers' perceptions. To fulfill the study's objectives, statistical tools including **One-Sample T-Test**, **Independent T-Test** and ANOVA were

employed to analyze the collected data. Data collection was performed using both primary and secondary methods. In order to assess the significance of the impact of artificial intelligence in learning on various gender groups regarding, the following hypotheses have been established and evaluated.

10. Analysis and Discussion

10.1 Teachers Perception towards artificial intelligence in learning

H01: There is no significant difference in teachers perceptions towards artificial intelligence in learning compared to general expectations.

The study attempted to investigate if teachers views of many characteristics of artificial intelligence in learning, such as Integrity in Academics: Cheating and Copying, Nurturing Original Thought and Innovation, Empathy and Personal Connection in Learning, Educators' Role and Employment Stability, Safeguarding Information: Confidentiality and Protection, aligned with popular expectations. Collected data from 80 respondents and examined their

perspectives about five dimensions (Table 1). The perceptions varied from 4.5075 for Safeguarding Information: Confidentiality and Protection to 4.8906 for Integrity in Academics: Cheating and Copying, showing an overall favourable attitude towards artificial intelligence in learning in all aspects.

Hypothesis testing shows that there was no substantial difference between teachers' perceptions and general expectations, the findings were enlightening. The p-values for each construct were all below 0.05, with values such as <0.0001 for Integrity in Academics: Cheating and Copying, Nurturing Original Thought and Innovation, Empathy and Personal Connection in Learning, indicating a high level of statistical significance discovered evidence to reject the null hypothesis across all dimensions. Consumer opinions of artificial intelligence in learning differed greatly from expectations, as the findings indicated that teachers hold a very positive image of artificial intelligence in learning in all assessed categories. This positive deviation indicates an increasing teacher

Table 1

Analysis of Teachers Perception towards artificial intelligence: One-Sample T-Test Results

Construct	N	Mean	Std. Deviation	t-value	P Value
Integrity in Academics: Cheating and Copying	80	4.8906	1.73335	4.596	<0.0001**
Nurturing Original Thought and Innovation	80	4.8500	1.81330	4.193	<0.0001**
Empathy and Personal Connection in Learning	80	4.8792	1.37998	5.698	<0.0001**
Educators' Role and Employment Stability	80	4.6208	2.04227	2.719	0.008**
Safeguarding Information: Confidentiality and Protection	80	4.5075	1.30353	3.482	0.001**

Source: Primary Data

preference and good perception of artificial intelligence in learning, beyond earlier predictions.

10.2 Gender wise Analysis of Teachers Perception towards artificial intelligence in learning

This part investigates the impact of gender on teachers attitudes towards artificial intelligence in learning, with a special focus on factors like Integrity in Academics: Cheating and Copying, Nurturing Original Thought and Innovation, Empathy and Personal Connection in Learning, Educators’ Role and Employment Stability, and Safeguarding Information: Confidentiality and Protection. Analysed responses from male and female respondents to identify any notable variations in how gender influences views towards adopting artificial intelligence in learning.

H02: There is no gender-based difference in perceptions towards artificial intelligence in learning regarding Integrity in Academics: Cheating and Copying,

Nurturing Original Thought and Innovation, Empathy and Personal Connection in Learning, Educators’ Role and Employment Stability, and Safeguarding Information: Confidentiality and Protection.

Observed significant variations in teachers views towards artificial intelligence in learning based on gender where as male teachers scored higher in Integrity in Academics: Cheating and Copying, Nurturing Original Thought and Innovation, Empathy and Personal Connection in Learning, indicating a more favourable view of artificial intelligence in learning compared to female teachers. Male respondents showed higher average scores in Integrity in Academics: Cheating and Copying (5.3830) and Nurturing Original Thought and Innovation (5.4326) compared to female respondents, who scored lower in both categories (4.1894 and 4.0202). Males consistently had higher averages in both the Empathy and Personal Connection in Learning Concern

Table 2
Gender Differences in Teachers Perceptions of artificial intelligence in learning: Independent T-Test Findings

Construct	Gender	N	Mean	Std. Deviation	t	P Value
Integrity in Academics: Cheating and Copying	Male	47	5.3830	1.34412	3.205	.002*
	Female	33	4.1894	1.98926		
Nurturing Original Thought and Innovation	Male	47	5.4326	1.56951	3.594	.001*
	Female	33	4.0202	1.83511		
Empathy and Personal Connection in Learning	Male	47	5.1986	1.16493	2.556	.013*
	Female	33	4.4242	1.54509		
Educators' Role and Employment Stability	Male	47	5.0851	1.76448	2.506	.014*
	Female	33	3.9596	2.24808		
Safeguarding Information: Confidentiality and Protection	Male	47	4.7277	1.25485	1.812	.075
	Female	33	4.1939	1.32616		

Source: Primary Data

and Educators' Role and Employment Stability constructs.

Study rejected the null hypothesis stating no gender-based difference in views towards artificial intelligence in learning considering Integrity in Academics: Cheating and Copying, Nurturing Original Thought and Innovation, Empathy and Personal Connection in Learning, Educators' Role and Employment Stability, and Safeguarding Information: Confidentiality and Protection. When analysing Performance, there was no statistically significant difference between male and female views (p -value > 0.05), indicating that both genders perceive the component of artificial intelligence in learning equally. Rejecting the null hypothesis in other fields indicates that gender influences views towards artificial intelligence in learning adoption, with males typically having more positive impressions than females. This discovery emphasises the need of taking into account gender disparities in measures designed to encourage the use of artificial intelligence in learning.

10.3 Age wise Analysis of Teachers Perception towards Artificial Intelligence in learning

This section explores the impact of age on teachers attitudes towards artificial intelligence in learning, specifically examining Integrity in Academics: Cheating and Copying, Nurturing Original Thought and Innovation, Empathy and Personal Connection in Learning, Educators' Role and Employment Stability, and Safeguarding Information: Confidentiality and Protection.. Statistical tool ANOVA was

used to analyse how opinions towards artificial intelligence in learning adoption are influenced by age differences.

H03: There is no significant difference in perceptions towards artificial intelligence in learning across different age groups in terms of Integrity in Academics: Cheating and Copying, Nurturing Original Thought and Innovation, Empathy and Personal Connection in Learning, Educators' Role and Employment Stability, and Safeguarding Information: Confidentiality and Protection.

The age-wise analysis of study on teachers views of artificial intelligence in learning, showed notable variations across different age groups in important areas: Integrity in Academics: Cheating and Copying, Nurturing Original Thought and Innovation, Empathy and Personal Connection in Learning Concern. Individuals' 25-30 age group had the greatest levels of worry and positive impressions, as shown by mean scores that were notably higher than those of older age groups. Individuals of 25-30 age group had an average Integrity in Academics: Cheating and Copying Concern score of 6.5156, which was significantly higher than the other age groups, suggesting a greater Integrity in Academics: Cheating and Copying Concern awareness among the younger participants. In both Nurturing Original Thought and Innovation and Empathy and Personal Connection in learning concern perspectives, the youngest age group consistently showed the most favourable attitudes towards artificial intelligence in learning.

Table 3
Age Group Differences in Artificial Intelligence in learning Perceptions:
ANOVA Results

Descriptive						
		N	Mean	Std. Deviation	F	P Value
Integrity in Academics: Cheating and Copying	25 - 30	16	6.5156	.28090	22.798	.000
	31-40	23	5.0000	1.53371		
	41-50	15	5.6500	.66682		
	Above 50	26	3.3558	1.62199		
	Total	80	4.8906	1.73335		
Nurturing Original Thought and Innovation	25 - 30	16	6.1250	.26874	14.774	.000
	31-40	23	5.2754	1.88736		
	41-50	15	5.4667	.63994		
	Above 50	26	3.3333	1.77639		
	Total	80	4.8500	1.81330		
Empathy and Personal Connection in Learning	25 - 30	16	5.2813	.45833	4.807	.004.
	31-40	23	5.1667	1.29782		
	41-50	15	5.3667	1.06010		
	Above 50	26	4.0962	1.67940		
	Total	80	4.8792	1.37998		
Educators' Role and Employment Stability	25 - 30	16	5.6042	1.20012	2.133	.103
	31-40	23	4.2609	2.27626		
	41-50	15	4.9333	1.59463		
	Above 50	26	4.1538	2.30407		
	Total	80	4.6208	2.04227		
Safeguarding Information: Confidentiality and Protection	25 - 30	16	4.8625	.75796	2.522	.064
	31-40	23	4.2087	1.46905		
	41-50	15	5.1200	.48285		
	Above 50	26	4.2000	1.58392		
	Total	80	4.5075	1.30353		

Source: Primary Data

However, there were no statistically significant differences among age groups in terms of Educators' Role and Employment Stability, and Safeguarding

Information: Confidentiality and Protection, as indicated by p-values over 0.05. Regardless of age, attitudes about the usefulness of artificial intelligence in

learning appear to be consistent. The null hypothesis, suggesting no significant change in opinions towards artificial intelligence in learning across age groups, was rejected for Integrity in Academics: Cheating and Copying, Nurturing Original Thought and Innovation, Empathy and Personal Connection in Learning Concern, but not for Educators' Role and Employment Stability, and Safeguarding Information: Confidentiality and Protection. The results emphasise the significance of age in influencing teacher attitudes towards artificial intelligence in learning. Younger person's exhibit more excitement and positively towards artificial intelligence in learning, potentially indicating changes in values and priorities throughout generations regarding sustainability and technology uptake.

11. Findings of the Study

Teachers have a highly positive perception of AI in learning, exceeding general expectations. The study found favourable attitudes towards AI across five dimensions: academic integrity, creativity, empathy, teacher role, and data protection. Teachers perceive AI as a valuable learning tool, promoting academic integrity, creativity, and student-teacher connections. The study revealed significant gender-based differences in teachers' views on AI in learning. Male teachers showed more favourable attitudes than female teachers, with higher average scores in: Integrity in Academics: Cheating and Copying and Nurturing Original Thought and Innovation. The null hypothesis was rejected, indicating gender influences views on AI in learning adoption, with males holding more positive impressions.

However, both genders perceived AI's performance in learning equally. Gender disparities exist in AI adoption, highlighting the need for targeted measures to encourage female teachers' acceptance and use of AI in learning.

The study revealed significant age-related differences in teachers' views on AI in learning, with younger teachers showing more favourable attitudes. Higher mean scores in Integrity in Academics: Cheating and Copying, Nurturing Original Thought and Innovation, and Empathy and Personal Connection in Learning among 25-30 age groups. Younger teachers exhibited greater awareness and positivity towards AI in learning. No significant differences among age groups in Educators' Role and Employment Stability and Safeguarding Information: Confidentiality and Protection. Age influences teacher attitudes towards AI in learning, with younger generations showing more enthusiasm and excitement. Age plays a significant role in shaping teacher attitudes towards AI in learning, highlighting potential generational shifts in values and priorities regarding technology adoption.

12. Conclusion and Implication of the Study

Teachers possess a profoundly positive perception of Artificial Intelligence (AI) in learning, exceeding general expectations. They view AI as a valuable tool that promotes academic integrity, creativity, and student-teacher connections, showcasing favourable attitudes across various dimensions, including academic integrity, creativity, empathy, teacher role, and data protection.

This suggests that teachers recognize the potential of AI to enhance the learning experience and are enthusiastic about its integration. The study also reveals significant gender and age-related differences in teachers' views on AI in learning. Male teachers exhibit more favourable attitudes than female teachers, highlighting the need for targeted measures to encourage female teachers' acceptance and use of AI in learning. Furthermore, younger teachers show more enthusiasm and positivity towards AI, emphasizing potential generational shifts in values and priorities regarding

technology adoption. These findings underscore the importance of considering demographic factors when implementing AI-driven learning tools, ensuring that all teachers are equipped to harness the benefits of AI in education. By addressing these differences, educators can create a more inclusive and effective learning environment that leverages AI's potential to improve student outcomes. Ultimately, the study's results have significant implications for the future of education, highlighting the need for strategic planning and support to ensure the successful integration of AI in learning.

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