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The Study of AI Tools Used for Teaching Effectiveness and its Perception in College Teachers with Special Reference to Mumbai

Ms. Hetal Uttmani

Research Scholar

Pillai College of Arts Commerce and Science.

Abstract

It is important to comprehend how artificial intelligence (AI) is used and perceived by college teachers as it continues to permeate numerous industries, including education. This study looks into how teachers in colleges use and perceive artificial intelligence (AI), with a particular emphasis on how it affects instructional efficacy and what obstacles stand in the way of its widespread adoption. The study investigates differences between genders in the perceived advantages of using AI and variances in barriers across academic streams using questionnaires and statistical analysis. The results show stark differences in attitudes and obstacles, underscoring the necessity for discipline-specific support networks and gender-sensitive AI integration plans. The study's conclusions highlight how crucial it is to implement focused interventions and improve the curriculum in order to support successful AI integration in higher education. With the use of questionnaires, interviews, and a review of the literature, this study offers information about the possibilities, difficulties, and status of AI integration in higher education.

Keywords: AI, College Teachers, AI tools, Teaching

Introduction

Artificial Intelligence (AI) is the capacity of a computer or a computer-controlled robot to carry out operations often performed by intelligent entities. These tasks call for the use of reasoning, discernment, meaning-finding, and experience-based learning. Developers teach AI to learn and adapt by using data collection techniques. It has the ability to forecast outcomes, provide strategies, solve issues, and provide answers to queries.

While some AI systems match human capabilities for particular activities, others perform jobs faster or more effectively than humans. AI is present in many things we do, from smart TVs to kitchen appliances, and everything in between, including your phone and automobile. But no AI on the market today is capable of the wide range of things that humans are capable of. Over time, our responsibilities as educators have evolved further. Technology always causes some reluctance, but AI is an extremely potent example. Given the potential effects of evolving technology on students' lives, it is imperative that educational institutions offer opportunity for students to learn about it. Artificial Intelligence (AI) tools have the potential to not only boost creativity and productivity but also offer instructors insightful data on student learning and help with time-consuming activities. It is crucial that we take the time to discuss artificial intelligence in our classrooms, despite all of its promises. In addition to imparting knowledge, we also act as mentors, educators, and co-learners alongside our students—especially in light of the more potent new technology. It's critical that we teach our pupils the advantages of these resources as well as how to utilize them sensibly, ethically, and correctly.

AI has been around since 1956 as an academic field, in addition to being used in supply chain management, military logistics, and medical diagnostics. 5. Since then, artificial intelligence has been used in education in a variety of ways, including systems to assist educational institution management, tools to help teacher instruction, and tools to support student learning and evaluation. The National Education Policy 2020 (NEP-2020), which recognizes the significant significance and potential of AI in human life, has advised that students acquire these many crucial skills by incorporating AI into the curriculum. This research paper is based on growing used of AI by senior college teachers for knowledge enrichment and making teaching learning enjoyable.

Objectives of the study

1. To assess the current level of adoption of AI tools among college teachers:
2. To explore the perceived benefits of AI integration in teaching:
3. To identify the challenges and barriers hindering the adoption of AI in higher education:
4. To understand college teachers' perceptions of AI's impact on teaching effectiveness:

Hypothesis

1. H1: There is significant Gender Difference in Perceived benefits of AI Usage on Teaching effectiveness

2. H1: There is significant difference in Barriers in using AI as per Stream of college teachers

Literature Review

1. Al Daryseh, (2023), Understanding how instructors view artificial intelligence (AI) and its role in educational technologies can be gained through an examination of the Technology Acceptance Model (TAM). According to the authors' analysis of 83 scientific instructors in Abu Dhabi, there is a beneficial correlation between educators and AI technologies when it comes to a variety of factors. The TAM Model is a theory that examines how people gravitate toward or away from technology and if they think it's a beneficial tool depending on certain parameters. Because the authors understood the benefits of technology for science-based curricula and that teachers generally accept artificial intelligence (AI) at a high rate, the sample they chose had a favorable attitude toward technology.

2. Kassymova, Malinichev, Lavrinenko, Panichkina, Koptyaeva, & Arpentieva, (2023), Students have benefited greatly from the digitalization of education brought about by technology and artificial intelligence, but there have also been drawbacks that raise ethical concerns about the appropriate and inappropriate use of these tools The authors present a compelling case for students to get instruction or training from humans as opposed to computers, arguing that the latter prevents pupils from developing morally and spiritually and results in a lack of values. This study examines how artificial intelligence (AI) and digital education affect family dynamics and culture in contemporary society. The values and interpersonal dynamics of successive generations are significantly shaped by education, since learners are profoundly impacted.

3. In their systematic evaluation of AI applications in higher education, Richter et al. (2019) found 146 publications published between 2007 and 2018 based on clear inclusion and exclusion criteria. They demonstrated that the majority of the fields involved in AIEd are STEM and computer science, and that the majority of empirical research employed quantitative methodologies. The study's conclusion stressed the need for more research on ethical and pedagogical approaches in the application of AIEd in higher education, as well as the dearth of critical reflection on the risks and challenges of AIEd and the weak connection between theoretical pedagogical perspectives.

4. Gocen & Aydemir (2020), In a phenomenological study using a qualitative research methodology, authors looked at the perspectives of participants from various industries. The result and findings of the study showed the potentialities, benefits and drawbacks of the arrival of AI in education.

Research Methodology

The research methodology is shown in following points:

Research Design: Descriptive design as it describes various AI tools used by teachers adopted and its benefits

Sample Size: 100 respondents

Sample techniques: Cluster cum Convenience

Tools used: A structured Questionnaire is used

Techniques of Analysis: Anova and T Test

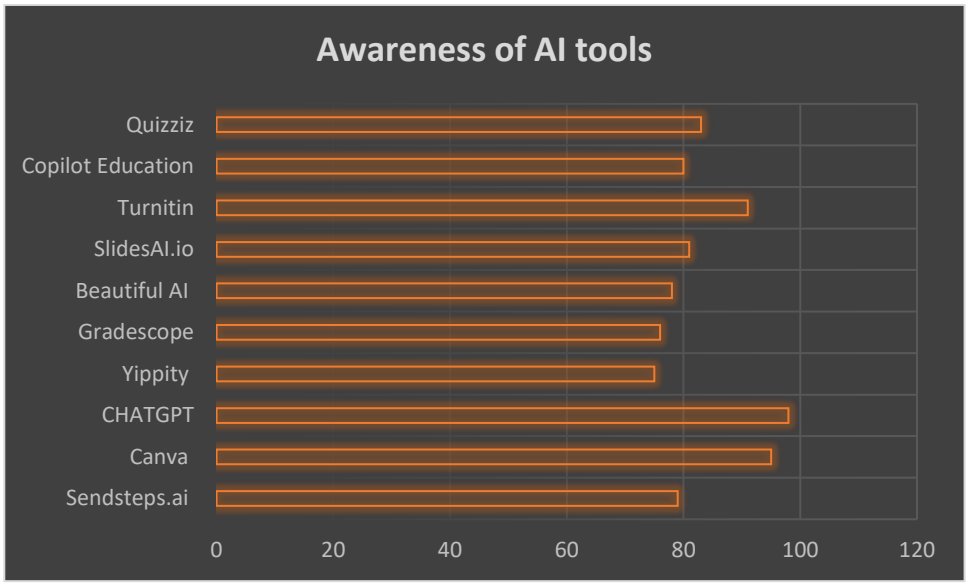
Results and discussions

Table 1: Demographic information of respondents

Age Group	N
20-30	29
31-40	44
41-50	17
50 and above	10
Gender	
Male	45
Female	55
Stream	
Arts and Humanities	23
Commerce and Management	39
Science and Technology	38
Annual Income	
less than 2 lakhs	21
2 lakhs to 5 Lakhs	57
5 to 10 lakhs	15
Above 10 Lakhs	7

This dataset provides information about the population under survey's demographics. It offers data, for instance, on how respondents are distributed across various age groups, genders, academic specializations, and income levels. Majority age group: 31-40 with 44 respondents., Majority gender: Female with 55 respondents, Majority stream: Commerce and Management with 39 respondents, Majority income bracket: 2 lakhs to 5 lakhs with 57 respondents.

Chart 1: Awareness and Utilisation of AI tools by college teachers



Of the respondents, 95% are familiar with Canva. Of the responders, 98% are aware of CHATGPT. This information sheds light on the respondents' degrees of awareness regarding various AI techniques. Understanding how these tools are adopted and viewed by the intended audience or community might be helpful. In the demographic studied, tools with greater awareness percentages are perhaps more well-known or often used, whilst those with lower percentages would be less so.

Table 2: T Test for Perception of AI's impact on teaching effectiveness- Benefits

H1: There is significant Gender Difference in Perceived benefits of AI Usage on Teaching effectiveness

Dimensions	**Gender**	**N**	**Mean**	**SD**	**Test of Homogeneity**		**T Test**	
					Levene's statistic	**p value**	**t value**	**P value**
Knowledge enhancement	Male	45	3.54	0.950	0.667	0.399	-1.788	0.015*
	Female	55	3.66	0.965				
Lesson plan generation	Male	45	3.59	0.906	1.526	0.101	-2.544	0.012**
	Female	55	3.77	0.953				
Variety of tools	Male	45	3.56	0.940	0.398	0.467	-1.089	0.001**
	Female	55	3.78	0.953				
Teaching learning enjoyable	Male	45	3.59	0.916	4.513	0.098	-3.222	0.015*
	Female	55	3.77	0.989				
Uptodate content	Male	45	3.57	0.843	3.330	0.024	-1.522	0.008**
	Female	55	3.75	0.878				

P value indicates the likelihood of getting the observed t-value in the event that the null hypothesis—that there is no difference in the means of men and women—is correct. A statistically significant difference between the means is shown by a low p-value (usually less than 0.05).

In conclusion, this table offers insights into how respondents—male and female—perceive several aspects of using AI technologies in the classroom, such as the creation of lesson plans, diversity of tools, enjoyment of teaching and learning, and current material. Additionally, it evaluates whether respondents who identify as male and female have significantly different opinions of each dimension.

Table 3: Anova for Barriers to adopting AI in educational practices

H1: There is significant difference in Barriers experienced while using AI tools as per Stream of college teachers

Barriers	**Stream**	**N**	**Mean**	**SD**	**Test of Homogeneity**		**ANOVA**	
					Levene's Statistic	**p value**	**F Value**	**p value**
Lack of Technology	Arts	23	3.76 a	1.011	1.667	0.267	3.178	0.033*
	Commerce	39	3.97 b	1.049				
	Science	38	3.98 a	1.227				
Lack of training and Expertise in using	Arts	23	3.67 ab	1.060	0.829	0.455	2.567	0.015*
	Commerce	39	3.77 b	1.022				
	Science	38	3.99 a	1.562				
Lack of Time	Arts	23	3.56 ab	0.568	1.456	0.233	4.910	0.013*
	Commerce	39	3.66 b	1.044				
	Science	38	3.73 a	1.137				

A low p-value (usually less than 0.05) indicates that the barrier's means vary significantly throughout academic streams.

In conclusion, this table offers insights into how respondents from diverse academic streams view a number of obstacles to the use of technology in the classroom, such as a lack of resources, insufficient time, and a lack of training or experience. It also evaluates whether views of these obstacles vary significantly throughout academic streams.

Implications:

This study's conclusions have a number of ramifications for legislators, educational establishments, and teacher preparation programs:

Gender-sensitive AI Integration: To accommodate the differing views and preferences of male and female teachers, educational institutions and policymakers should create gender-sensitive ways for integrating AI tools in teaching practices.

Discipline-specific Support: To meet the particular challenges faced by teachers from diverse academic streams, such as filling in technological gaps or offering specialized training programs, institutions should offer discipline-specific training and assistance.

Professional Development: To increase teachers' confidence and ability in utilizing AI tools effectively, teacher training programs should place a high priority on AI literacy and offer opportunities for continuous professional development.

Enhancement of Curriculum: In order to make sure that students have the skills they need, educational institutions should think about incorporating AI education into the curriculum.

Conclusion:

The study's conclusions provide insight into how college instructors view and deal with the employment of artificial intelligence (AI) tools. The study found that male and female teachers had significantly different perceptions of the advantages of using AI to improve their ability to teach. It also emphasized how different academic streams face different obstacles when utilizing AI techniques.

Regarding the many aspects of AI integration in education, such as knowledge augmentation, lesson plan production, variety of tools, enjoyment of teaching and learning, and access to current content, there were discrepancies between the perspectives of male and female teachers. These variations highlight how crucial it is to take gender-specific viewpoints into account when integrating AI technologies in learning environments. Additionally, the study found specific obstacles to implementing AI in teaching techniques, including a lack of resources, time restraints, and training. Teachers from various academic streams faced diverse obstacles, which highlights the necessity for specialized interventions and support networks that are adapted to the unique requirements of each subject.

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