

Understanding AI-Driven Teaching: Key Factors Shaping Adoption in Higher Education

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Abstract: *AI plays a major role in enhancing teaching effectiveness in higher education institutions. The Study aims to identify the major factors leading to adoption of AI-enabled teaching process. The paper explores the various Technological factors, Pedagogical factors, social factors, ethical factors and institutional factors which will influence the teachers in higher education level to adopt AI enabled course content, simulation learning, curated assessments and classroom engagement. It will also be defining the impact of AI in higher education. The study has conceptualized two variables that is independent variable which is Factors like facilitating conditions, awareness, ethical aspects, attitude, faculty perception towards AI enabled class room engagement and independent variable that is effective work management. The study is descriptive in nature and the primary data is used to collect the data, The respondents for the study are Teachers working in institute, college and university level. The data collected is analysed using data analysis tools like Descriptive statistics, Two-way Anova, Spearman rank Correlation, the data will be analysed using SPSS. The findings reveal that factors like awareness, attitude, behavior and facilitating conditions are highly positively related to effective work management whereas ethical aspects has shown lower relationship comparatively.*

Keywords: Awareness level, Attitude, facilitating conditions, behavior, Ethical aspects and work engagement

1. Introduction

AI plays a major role in transforming education by providing engaging teaching-learning processes, personalised learning experiences, intelligent tutoring systems and automated administration. Integrating AI into traditional teaching methods improves educational outcomes by offering innovative solutions to cater to diverse learning needs. AI can assist teachers by automating various administrative jobs like grading, assessment, preparation of study material and data management. It also helps identify the trends and patterns while assessing students' performance which in turn assists the teacher in the students' performance better (Ritu Arya and Ashish Verma, 2024). The advantages provided by AI are also backed by pedagogical challenges such as teachers' dependency on AI content and the lack of human interaction by providing assessments through the AI channels. The teachers are required to be AI literate and need comprehensive training programs. It has been observed that teachers resist technological changes, which creates hurdles in the adoption of technologies. The teachers also fear job loss which may reduce their interest in engaging with the students (Marcio Goncalves Dos Santos, 2024). The new education policy 2020 focuses on a transformed India, with an education system that contributes to quality education for all making India a Globally recognised Superpower. The use and integration of new technologies involving artificial learning, smart boards and other forms of educational hardware and software play an important role in providing suitable, engaging and multidisciplinary education to all the students at all levels (NEP_Final_English_0.Pdf, n.d.). A study on the awareness level of lectures emphasizes educators' unpreparedness for integrating AI in teaching. It indicates a

general tendency of teachers to avoid or underutilize the AI usage due to inadequate training and support. It also shows that around 10% of the teachers are well familiar with the existing AI tools that can be used for teaching (Roshan et al., 2024). There are several ethical challenges like data privacy, algorithms bias, transparency, accessibility and ethical responsibilities of educators, that contribute to the ethical aspects in teaching.

Data Privacy: Teachers have a significant concern regarding the access and management of sensitive personal information of students. AI adoption raises issues related to data storage, usage, and sharing without prior consent.

Algorithmic Bias: AI algorithms have the potential to show biases towards a specific information. This risk necessitates careful monitoring of data to ensure equitable educational outcomes for all the students.

Transparency and Accountability: Transparency at the data collection processes is crucial. It is important that students and their families are well informed and provide consent for the data collection.

Accessibility: There is a risk that AI could widen the digital divide if access to these technologies is not equitable across different socio-economic groups.

Ethical Responsibilities of Educators: Teachers must ensure that AI implications and technologies support rather than replace human interaction. They have a responsibility to monitor the effects of AI on learning outcomes and maintain pedagogical autonomy (Federal Institute of Parana,

Department of Management and Business. & Goncalves Dos Santos, 2024). By addressing these challenges proactively, educational institutions can work towards a more ethical integration of AI technologies in teaching practices.

2. Background of the Study

a) Awareness level

The awareness level of educators plays a significant role in the adoption of AI. Empirical evidence suggests that the more educators become knowledgeable of technological advancements and Ai, they are more inclined to integrate these tools in their teaching. Such integration leads to enhanced learning experiences, the creation of personalised learning environments and improved students engagement (Chiu et.al, 2024.).

b) Attitude impact

Attitude has a profound impact on the design and delivery of effective teaching, particularly with AI strategies. Positive attitudes towards AI can enhance the integration of technology in educational settings, leading to improved student engagement and personalized learning experiences. Teachers' attitudes like their intention to use AI significantly affect their teaching practices, as shown in studies involving primary mathematics educators in China (Li & Noori, 2024).

c) Behaviour impact

The integration of behaviour in teaching significantly influences the design and delivery of effective educational strategies, particularly when enhanced by AI technologies. AI technologies enable personalized learning experiences that tailor educational content to individual students' needs. This enhances engagement and inclusivity. Intelligent tutoring systems provide real-time feedback, thereby allowing students a more engaging and effective learning environment (Mishra, 2024).

d) Facilitating conditions of AI technologies

AI technologies have the potential to revolutionize teaching by automating administrative tasks, offering real-time feedback, facilitating professional development, enhancing teaching strategies, and promoting inclusivity in education. Hence, it is the need to provide training and support to

educators to effectively integrate into their teaching practices (*Artificial Intelligence in Education* / UNESCO, n.d.).

e) Ethical aspects of AI technologies

Ethical considerations include mitigating bias and ensuring fairness in AI algorithms. It avoids discriminatory outcomes for students by protecting student data privacy and security. Transparent data collection and usage practices of AI tools must be maintained. Human interference and teacher autonomy prevents over-reliance on AI and preserves the essential human element in education. Accountability for AI-driven decisions needs to be established, along with addressing access and equity to prevent exacerbating existing inequalities. The impact of AI on the teaching profession itself requires careful consideration to ensure a positive and sustainable future for educators.

3. Conceptual Framework

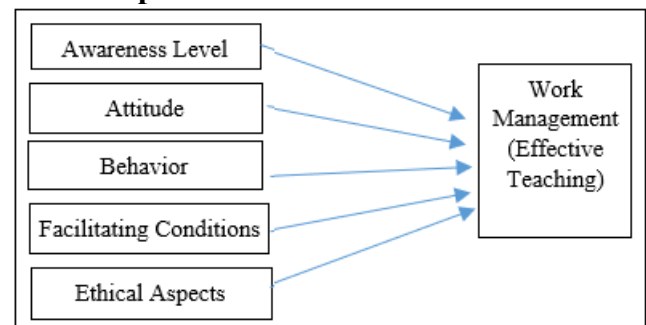


Figure 1: Research Framework
(Source: Authors)

4. Methodology

4.1 Data & Sample

The data was collected from the 66 teachers working in various universities & colleges at different designation level and the data was collected through a structured questionnaire using google forms and data collected was further analysed using various statistical tools like mean score, two-way anova and spearman's rank correlation.

4.2 Hypothesis

Table 1: Table showing hypothesis developed based on literature

No.	Hypothesis
H ₁	<i>There is a significant interaction effect between age and gender on awareness towards AI enabled teaching.</i>
H ₂	<i>There is a significant interaction effect between age and gender on attitude towards AI enabled teaching.</i>
H ₃	<i>There is a significant interaction effect between type of institute & designation on facilitating conditions that supports AI enabled teaching</i>
H ₄	<i>There is a significant interaction effect between designation & age on ethical aspects of AI enabled teaching</i>
H ₅	<i>Awareness about AI tools in teaching is positively related to effective work management</i>
H ₆	<i>Facilitating conditions to use AI tools in teaching is positively related to effective work management</i>
H ₇	<i>Attitude to use AI tools in teaching is positively related to effective work management.</i>
H ₈	<i>Behavior to use AI tools in teaching is positively related to effective work management.</i>
H ₉	<i>Ethical way of using AI tools in teaching is positively related to effective work management.</i>

4.3 Empirical Result

Table 2: Demographic description of sample

Variables	Category	N	%
Gender	Male	28	42%
	Female	38	58%
Age	Less than 25	4	63%
	26- 35	34	34%
	36-45	28	4%
	above 46	0	
Designation	Teaching Assistant	4	6%
	Assistant Professor	58	88%
	Associate Professor	4	6%
	Professor	0	
Type of Institute	State/Central University	8	12%
	Private University	40	61%
	Affiliated Colleges	16	24%
	Autonomous College	2	2%

The Study is conducted using the primary data for data collection and above Table 2 represent the demographic

description of respondents in terms of Gender, Age, Designation and Type of Institute.

Table 3: Mean Score of awareness level among teachers towards different AI Tools:

AI Tools	Awareness Level
Mentimeter	3.2
Curipod	3.1
Gradescope	3.0
Quizizz	3.6
chatgpt	4.5
QuillBot	4.1
Khanmigo	3.1

From the above Table 3, it could be understood that awareness level towards Chatgpt is higher than other AI Tools. As a study also reveals high usage of chat gpt by teachers for planning for the courses (Mughairi, & Bhaskar, 2024).

Table 4: Category wise awareness level towards AI Tools in teaching

Category	Gender		Age			Type of Institute				Designation		
AI Tools	M	F	< 25	26-35	36-45	Central/State	Private	Affiliated	Autonomous	Teaching Assistant	Assistant Professor	Associate Professor
Mentimeter	3.2	3.2	4.15	3.2	3.2	3.1	3.2	3.2	3.2	3.2	3.2	3.1
Curipod	3.1	3.1	3.15	3.0	3.1	3.0	3.1	3.1	3.1	3.1	3.1	3.0
Gradescope	2.9	3.0	3.06	3.0	3.0	2.9	3.0	3.0	3.0	3.0	3.0	2.9
Quizizz	3.6	3.5	2.97	3.5	3.5	3.5	3.6	3.6	3.5	3.5	3.6	3.5
chatgpt	4.6	4.5	4.52	4.5	4.6	4.6	4.5	4.5	4.5	4.5	4.5	4.6
QuillBot	4.3	4.1	4.06	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Khanmigo	3.0	3.1	3.09	3.1	3.1	3.0	3.1	3.1	3.1	3.1	3.1	3.0
Average Score	3.5	3.5	3.6	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5

Inference: From the above Table 4, it could be understood that awareness level towards Chatgpt, Quizizz and Quillbot is higher than other AI Tools. Lower level of awareness level towards Gradescope. And another observation is irrespective of gender, age, designation and type of institute the awareness level towards AI tools remains the same.

4.3.1 Two-way Anova:

H₁: There is a significant interaction effect between age and gender on awareness towards AI enabled teaching.

H₂: There is a significant interaction effect between age and gender on attitude towards AI enabled teaching.

H₃: There is a significant interaction effect between type of institute & designation on facilitating conditions that supports AI enabled teaching.

H₄: There is a significant interaction effect between designation & age on ethical aspects of AI enabled teaching.

Table 5: Two-way Anova for interaction effect on AI enabled teaching:

Dependent Variable	Fixed Factor	F-Value	Sig, (p-Value)	Interpretation
Awareness level towards AI enabled Teaching	Gender	0.304	0.739	Since both p-values > 0.05, neither Age nor Gender alone significantly affects AI awareness.
Awareness level towards AI enabled Teaching	Age	2.36	0.129	
Interaction effect	Gender*Age	7.402	0.001*	Effect of Age on AI awareness depends on Gender (or vice versa).
Attitude towards AI enabled teaching	Age	2.009	0.143	Since both p-values > 0.05, neither Age nor Gender alone significantly affects attitude towards AI enabled teaching
Attitude towards AI enabled teaching	Gender	0.016	0.899	
Interaction effect	Gender*Age	5.79	0.04*	Effect of Age on attitude towards AI enabled teaching depends on Gender (or vice versa).
Facilitating Conditions that supports AI enabled Teaching	Type of Institute	2.286	0.088	Since both p-values > 0.05, neither Type of institute nor Designation alone significantly affects AI supportive teaching
Facilitating Conditions that supports AI enabled Teaching	Designation	4.941	0.1	
Interaction effect	Type of Institute* Designation	1.526	0.02*	Effect of type of institute on Facilitating conditions depends on Designation (or vice versa).
Ethical Aspects while using AI enabled teaching	Designation	0.243	0.785	Since both p-values > 0.05, neither designation nor age alone significantly affects ethical aspects of AI teaching
Ethical Aspects while using AI enabled teaching	Age	2.469	0.093	

Interaction effect	Designation*Age	1.622	0.206	Effect of designation on ethical use of AI in teaching process does not depends on Age (or vice versa).
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4.3.2 Spearman's Rank Correlation:

H_5 : Awareness about AI tools in teaching is positively related to effective work management.

H_6 : Facilitating conditions to use AI tools in teaching is positively related to effective work management.

H_7 : Attitude to use AI tools in teaching is positively related to effective work management.

H_8 : Behavior to use AI tools in teaching is positively related to effective work management.

H_9 : Ethical way of using AI tools in teaching is positively related to effective work management.

Table 6: Table Showing correlation among various factors of AI enabled teaching

Factors	Awareness	Facilitating Conditions	Attitude	Behavior	Ethics	Work engagement
Awareness	1.000					
Facilitating Conditions	.249*	1.000				
Attitude	.386**	.352**	1.000			
Behavior	.361**	.276*	.698**	1.000		
Ethics	.133	.329**	.097	.131	1.000	.327**
Work engagement	.542**	.473**	.608**	.702**	.327**	1.000

** denote significance at 1% level

*denote significance at 5%

Inference:

The above table (6) indicates that various factors like awareness, facilitating conditions, attitude, behavior and ethical aspects are significantly related with work engagement, which means teachers will be able to deliver information effectively and can make classroom sessions more interactive and engaging due to incorporation of AI enabled teaching and Hence, teachers can consider AI as a teaching aid which facilitate effective teaching learning experience. But in terms of ethical aspects, it is observed that it holds low level of positive correlation with work management as the correlation value is 0.32 than compared to other factors and similarly facilitating conditions are also holding lower correlation value of 0.47, indicating lower positive relationship with work management.

5. Conclusion & Scope for Further Study

Soon after Covid, the usage of AI has become very popular and this digital transformation has impacted the higher education a lot. As the saying is only change is constant and change is sometimes scary too. Although plenty of studies shows that AI cannot take the job of teachers. As long as teachers are not completely dependent on it that is teachers need to use AI as a teaching aid to gain knowledge or learn a new skill, Using such information ethically either by acknowledging it and drawing better understanding and interpretation then its safe. We may use AI as a tool rather than as a threat and human involvement is very necessary for enabling interactive and effective teaching and learning process. Further study could focus on understanding implication of AI or GenAI from students perspective and administrative level. Studies could also focus on using AI tool by teachers in up-skilling and up-dating their curriculum and pedagogies.

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