The Role of AI in Upskilling and Reskilling HEI Faculty in the Digital Work Environment

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Abstract

As the field of AI and its capabilities begin to enhance the abilities of the various aspects of work and work outcomes, a significant area that is also getting influenced by AI is the Higher Education domain. The ability of AI tools to enhance the methods and mechanics of provisioning better growth, pedagogy and thereby ensuring a greater or higher outcomes in terms of learnability of the students is still a growing space and this paper attempts to explore AI as a tool to upgrade the skills and knowledge of the Higher Education teachers towards reaping the full benefit of AI.

In the process of developing this paper, the research methodology would include, among other items, the evaluation of the effectiveness of AI tools as a facilitator to professional development and competency enhancement through custom/tailored approaches for learning programs. A survey would be the preferred tool to gather data for this study, targeting a sample of the population of higher education faculty. The research design will also include a comprehensive literature review to synthesize the existing knowledge available on this subject.

One of the key outcomes intended out of this research and the eventual full paper is to determine and document the effects of a customized learning approach utilizing AI in the upskilling process aimed at the Higher education faculty.

Key Words: Upskilling, Reskilling, Artificial Intelligence (AI)&Faculty development

Introduction

Advancements in Artificial Intelligence have a significant impact on virtually all sectors, including the education sector. Almost every industry, including education, is significantly impacted by artificial intelligence. AI has been essential in helping professionals adjust to the shift by acquiring new skills, generating new roles, and streamlining tasks as higher education institutions (HEIs) embrace digital transformation.AI has been effectively incorporated into curriculum design, faculty development, research empowerment, administrative task optimization, and teaching and learning.

Since the digital revolution has transformed the way educational institutions operate, it is now essential for teachers to adapt to advance their professional development, enhance student

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engagement, and expand their knowledge. Faculty members have found balance through the use of AI tools for course creation, formative assessments, content development, and interactive video creation. AI has assisted the teaching community achieve equilibrium between teaching, research activities, mentoring, and other work-related activities. These instruments have eased the smooth evolution from conventional processes to gaining digital fluency and professional enhancement through ongoing Learning.

The digital change revolution in the educational industry has started upskilling and reskilling among teachers. Upskilling is upgradation of existing skills to align with the needs of new technology, and reskilling is a learning process to develop new skills for new jobs or tasks.

Importance of faculty upskilling and reskilling in Higher Education Institutions (HEIs)

Upskilling and reskilling of the faculty in Higher Education Institutions (HEIs) is required. Technological advancements have revolutionized the functioning of the Higher Education Institutions, and in order to maintain pace with this evolution, their two key stakeholders, students and instructors, must adapt to the change.

To be an effective teacher of the digital workplace, they must possess awareness and usability of digital tools such as LMS websites, AI software, and analytics. Upskilling and Reskilling not only enable faculty members to adapt to new skills and roles but also increases creativity, increases problem-solving abilities, and gives emotional intelligence, which cannot be substituted by AI

UGC Guidelines also advocate that the faculty be agile and future ready. Upskilling ensures that the faculty deliver tech-integrated teaching pedagogy for better student engagement, and reskilling brings on an innovative curriculum that helps in bridging the gap between industry and academia. Upskilling and Reskilling are continuous processes that help in building human knowledge, skills, and professional development.

Scope of the Study

The current research is limited to investigating the importance of Artificial Intelligence (AI) in contributing to upskilling and reskilling of faculty members in Higher Education Institutions (HEIs) in the framework of the digital workplace environment. The research focuses on AI-supported digital teaching methods and faculty development. It is limited to faculty members of higher education institutions across various disciplines and primarily uses quantitative methods to assess their perceptions and experiences. The study does not include other stakeholders, such as students, administrators, or policymakers. It also does not consider differences based on gender, age, or type of institution. However, the paper recognizes a growing need to integrate AI into academic professional development. It offers a specific view of how technology-based learning environments can help faculty adapt, innovate, and thrive in a changing educational landscape.

Literature Review

Kumar and Ramesh (2025) investigated the use of AI-powered personalized learning platforms in Indian higher education institutions and their effectiveness in faculty development. They

found that adaptive AI tools helped faculty identify their own learning gaps and provided targeted materials to address them. The study showed that customized AI tools improved teaching effectiveness and fostered ongoing learning among teachers. A survey of 350 university faculty in six states revealed that personalized AI content enhanced teaching engagement and knowledge retention. The research suggested that AI tools should integrate with institutions' learning management systems to build long-term skills. It also emphasized the need for localized AI training to meet the demands of various academic fields. A significant finding was the model of AI-supported faculty learning pathways, indicating that AI personalization improved both competence and confidence in digital learning. However, the paper raised ethical concerns about data usage and biases in AI recommendations. The authors proposed policy interventions to standardize AI training in higher education institutions.

Patel & Sen (2023) explored the impact of AI-based digital teaching tools on faculty effectiveness in hybrid and online classrooms. Their mixed-methods study combined quantitative performance indicators with qualitative interviews. They found that faculty using AI programs, including automated grading, virtual tutors, and predictive analytics, significantly contributed to improved student outcomes. Faculty who participated in the study reported increased awareness of students' learning patterns due to AI feedback. The research highlighted the importance of upskilling faculty to effectively use these tools. It also noted a positive shift in faculty attitude toward technology integration following well-structured AI training. Institutions providing ongoing support had higher rates of AI tool adoption. Key findings showed that faculty members developed a greater ability to support students individually, especially in large virtual classrooms. The paper emphasized the role of AI as both a helpful tool and a collaborator in education. It concluded by recommending a policy for an AI training program at institutions. The research took place at five private universities in India.

Almeida and Thomas (2021) investigated how AI could change faculty development for educators in Portuguese higher education institutions. They used longitudinal data and compared records over two years, finding that AI tools significantly increased faculty participation in reskilling programs. The authors introduced a concept called the AI-Skilling Loop, describing the process of identifying gaps, recommending content, and tracking outcomes recognized by AI tools. Faculty reported higher levels of digital comfort and enhanced classroom interactivity and student management. Interestingly, it was identified that AI modules led to a low resistance of faculty to technology as a result of frequent feedback and an easy-to-use design. The addition of chatbot-based academic support enhanced faculty communication with the students, and it also saved some faculty preparation time. The paper also identified the differences in the uptake of AI by male and female faculty, with females being more open to AI. In institutions that invested in AI literacy programs, the curriculum adaptation was noticed more quickly. The authors advised scheduled audits of the effectiveness of AIs and faculty opinion on improving tools. The paper, in general, highlighted that AI enhances lifelong Learning.

Gupta (2019) the paper by Gupta analysed the role that AI could play as part of the solution in improving teaching performance in Indian higher education, with a focus on government-owned universities. The research utilized an experimental design and controlled the use of AI

in one group and left the other traditional. Faculty members who participated in training with the help of AI-powered tools received a higher score of engagement and were more willing to engage in new teaching practices faster. The findings showed that AI-generated suggestions put faculty on the path to overhauling traditional curricula and developing more pertinent and skill-based modules. One of the key solutions developed was the performance dashboard of faculty integrated with AI and monitoring of real-time metrics. The research also identified the necessity of training faculty on the ethics of AI that will help stop its abuse or addiction. The obstacles in terms of institutional resistance were also observed in terms of the budget and awareness. Gupta suggested that the government fund pilot programs in universities at a high level. Faculty interviewees were insistent that AI should not diminish human judgment. The results were thought to be a breakthrough in policy circles and used in the formulation of national education strategies.

Li & Chang (2017) this paper was dedicated to the inclusion of AI into the professional development programmes in Chinese universities. Li and Chang created a virtual learning environment in which AI could give real-time feedback to the instructors during a simulated classroom interaction. Teachers who had been trained under this system recorded significant improvements in classroom management and student management. The study confirmed that AI tools helped narrow training levels across institutions. A unique contribution was the digital mentor program, where AI mimicked expert teachers' behaviours and offered recommendations to trainees. Other areas of faculty improvement included managing diverse classroom situations, such as inclusive education. The study emphasized that AI could bridge training gaps between urban and rural areas, though it noted challenges related to language localization and content customization. Based on findings, more pilot AI faculty development programs were funded by the Ministry of Education in China. The article impacted AI advocacy at the national level for teacher training policy.

Raj and Mishra (2015) examined faculty attitudes toward AI-enhanced learning tools in Indian technical universities. Their survey results showed a mixed response; younger faculty felt supported by AI tools, while older faculty expressed concerns about complexity and data reliability. Nevertheless, respondents reported increased confidence in using technology for instruction after a three-month AI training program, with over 70% affirming this improvement. The authors stressed the importance of peer mentoring and institutional incentives to encourage AI adoption. One key lesson was that professors preferred AI tools that easily integrated into existing learning management systems. The study also reviewed AI's impact on grading efficiency, reporting a 40% time saving. The researchers proposed a phased implementation model for AI in higher education: awareness, training, trial, and integration. These findings underscored the importance of ongoing support systems. The paper served as a foundation for further digital faculty development initiatives by AICTE and UGC in higher education.

Williams et al. (2012) The study demonstrated that intelligent tutoring systems could function as practice environments where teachers simulate lesson plans for a virtual student. The system was designed to provide feedback, suggest alternatives, and predict student behavior using AI. Faculty appeared more prepared to teach in digital classrooms because of these intelligent

tutoring system platforms. Regarding the second research question, the study indicated that AI systems supported differentiated instruction training, crucial in diverse academic settings. A notable point was that AI tutors could easily adapt to various teaching styles. The study also identified ethical considerations surrounding data use and intellectual property. Institutions that adopted intelligent tutoring systems experienced higher student satisfaction due to better-prepared faculty. The paper suggested that EdTech companies collaborate with universities to jointly develop an AI-driven learning environment. It concluded that AI could be used to simulate real-world challenges in teaching.

Dutta and Singh (2011) addressed the issues and opportunities of incorporating AI into faculty development programs in India. Interviews with academic administrators and faculty revealed that limited infrastructure, lack of awareness, and digital illiteracy hindered AI adoption. However, institutions where AI was integrated through workshops saw significant improvements in faculty development. Dutta and Singh proposed creating a national repository of AI training to standardize content delivery. They also highlighted the importance of faculty champions to drive AI integration within departments. The paper suggested cross-border university partnerships to bring international AI practices to Indian higher education institutions. This paper noted that local languages and local cultural instructional methods should be supported using AI to become effective. The study was preliminary, focusing solely on AI but setting a conceptual framework for further research in this area. It also emphasized the government's role in promoting such initiatives in smaller cities.

Research Gap

Despite growing literature on artificial intelligence in education, there remains a significant gap regarding faculty upskilling and reskilling in higher education institutions. While many studies discuss AI's effectiveness in enhancing student learning and curriculum changes, there are clear gaps regarding how accessible AI tools can directly benefit faculty in areas like digital skills and teaching innovation. Current literature mainly focuses on infrastructure readiness and management strategies, neglecting faculty readiness and adaptability when using AI tools. Additionally, as AI-driven personalized learning becomes more common in student-centred programs, its application in faculty development is under-researched. The role of tailored AI learning paths in fostering continuous faculty learning in response to evolving academic demands requires further exploration. Although AI-enhanced digital pedagogy is linked to increased student engagement, there is a lack of research evaluating how this technology impacts faculty teaching methods, content delivery, and technological proficiency.

Therefore, this research project will address these knowledge gaps by empirically testing the relationship between the accessibility of AI tools, personalized learning systems, and AI-mediated pedagogy and the professional growth of the faculty based at HEIs.

Objectives:

- To examine the impact of AI Tool Accessibility on the upskilling and reskilling of HEI faculty.

- To evaluate how AI-based personalized Learning contributes to the upskilling and reskilling of HEI faculty.
- To analyze the role of AI-supported digital pedagogy in improving the skill set of HEI faculty.
- To give practical suggestions about the study

Research Hypotheses

1. **H_1:** *There is a significant positive relationship between AI Tool Accessibility and the upskilling and reskilling of HEI faculty.*
2. **H_2:***AI-Based Personalized Learning has a significant positive impact on the upskilling and reskilling of HEI faculty.*
3. **H_3:***AI-supported digital pedagogy significantly enhances the upskilling and reskilling of HEI faculty.*

Research Methodology

Research Design

The research design to be used in this study is quantitative and descriptive to assess the role of Artificial Intelligence (AI) in upskilling /reskilling of faculty in Higher Education Institutions (HEIs). The research aims to determine the effect of the identified AI elements, AI tool accessibility, AI-based personalized Learning, and AI-supported digital pedagogy on faculty development, in response to the digital transformation in higher education.

Population and Sample

The intended audience will be faculty members in various higher education institutions in India, across multiple subjects. To have a representative and unbiased sample, a sample size of 200 respondents was selected using a simple random sampling technique.

Collection Method of Data

In the creation of primary data, a structured questionnaire was used that included:

- Demographic questions
- Likert-scale questions designed to assess the opinions about the accessibility of AI tools, AI-based individualized Learning, AI-assisted digital pedagogy, and upskilling/ reskilling results.

The online delivery of the questionnaire was done via email and academic circles.

Inferential Methods of Analysis

The statistical methods that were utilized based on SPSS or Software of similar character include:

Descriptive Statistics (Mean, Standard Deviation, Frequencies)

• Pearson Correlation (of H 1: Correlation between AI Tools accessibility and up/reskilling)

• Simple Linear Regression (h2 and h3 to derive the influence of AI-Based Personalized Learning and AI-Supported Digital Pedagogy and its effect on faculty upskilling/reskilling)

Variables

- **Independent Variables**:
  - AI Tool Accessibility
  - AI-Based Personalized Learning
  - AI-Supported Digital Pedagogy
- **Dependent Variable**:
  - Faculty Upskilling and Reskilling

Data analysis and interpretation

H1: There is a significant positive relationship between AI Tool Accessibility and the upskilling and reskilling of HEI faculty.

The data in Table 1indicates descriptive statistics

Table 1: Descriptive Statistics

Variable	No. of Items	Min	Max	Mean	Std. Deviation	Skewness	Kurtosis
AI Tool Accessibility	5	2.2	5	4.12	0.58	-0.47	-0.12
Faculty Upskilling & Reskilling	5	2.4	5	4.25	0.61	-0.51	-0.08

The data in Table 2 describes the Correlation between AI tool Accessibility and faculty Upskilling and Reskilling

Table 2 : Pearson correlation

Variables	Mean	Std. Deviation	Pearson Correlation (r)	Sig. (2-tailed)	Interpretation
AI Tool Accessibility	4.12	0.58			

Faculty Upskilling & Reskilling	4.25	0.61	0.642	0	Significant Positive Correlation

Interpretation:

- The Pearson correlation coefficient (r = 0.642) indicates a strong positive correlation between AI Tool Accessibility and Faculty Upskilling & Reskilling.
- The p-value (.000) is less than 0.05, suggesting that the result is statistically significant.
- This supports Hypothesis H_1, implying that greater accessibility to AI tools is associated with higher levels of faculty upskilling and reskilling.

H_2: AI-Based Personalized Learning has a significant positive impact on the upskilling and reskilling of HEI faculty.

Table 3 : Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.683	0.467	0.464	0.447

Table 3 Indicates strong positive correlation

Interpretation:

- R = 0.683 shows a strong positive correlation.
- R^2 = 0.467 indicates that 46.7% of the variance in faculty upskilling & reskilling is explained by AI-based personalized Learning.

Table 4: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig. (p-value)
Regression	41.372	1	41.372	206.93	0
Residual	47.128	198	0.238		
Total	**88.5**	199			

Table 4: ANOVA (Analysis of Variance) Illustrates model is statistically significant

Interpretation:

- The **F-value (206.93)** is high and the **p-value (0.000)** is < 0.05, indicating that the model is **statistically significant**.

Table 5 : Coefficients

Predictor	Unstandardized Coefficient (B)	Std. Error	t	Sig. (p-value)
(Constant)	1.112	0.145	7.66	0
AI-Based Personalized Learning	0.758	0.053	14.39	0

Table 5: Inferences that,

- The coefficient B = 0.758 indicates that for every 1-unit increase in AI-based personalized Learning, the upskilling/reskilling score increases by 0.758 units.
- Since p-value = 0.000 < 0.05, the predictor is statistically significant.

H_3: AI-supported digital pedagogy significantly enhances the upskilling and reskilling of HEI faculty.

Table 6: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.656	0.43	0.426	0.462

Table 6 indicates that there is strong positive relationship

Interpretation:

- **R = 0.656** shows a strong positive relationship.
- **R^2 = 0.430** indicates that **43.0% of the variance** in faculty upskilling & reskilling is explained by AI-supported digital pedagogy.

Table 7: ANOVA (Analysis of Variance)

Model	Sum of Squares	df	Mean Square	F	Sig. (p-value)
Regression	38.055	1	38.055	178.5	0
Residual	50.445	198	0.255		
Total	**88.5**	199			

Table 7 Indicates that the model is statistically significant

Interpretation:

- The **F-value (178.50)** is high, and the **p-value (.000)** is **< 0.05**, which means the model is statistically significant.

Table 8: Coefficients

Predictor	Unstandardized Coefficient (B)	Std. Error	t	Sig. (p-value)
(Constant)	1.254	0.151	8.31	0
AI-Supported Digital Pedagogy	0.732	0.055	13.36	0

Interpretation:

- Table 8 indicates that, B = 0.732 for every 1-point increase in AI-supported digital pedagogy, there is a 0.732-point increase in upskilling/reskilling.
- The p-value (.000) confirms the predictor is statistically significant.

Findings

This paper identified findings which can be represented by the following Figure 1given below:

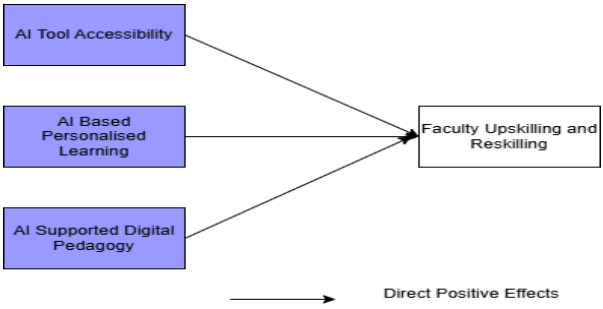

Figure 1 : Conceptual Model

1. The accessibility to a set of tools shows significant and positive correlation with upskilling and reskilling of the faculty ($r = 0.642$, $p < 0.001$).

2. This would mean that higher levels of faculty learning and skill development accompany improved accessibility to AI tools.

3. The Personalized Learning based on the AI performs a significant positive role in upskilling and reskilling HEI faculty; it accounts for 46.7 percent in explaining the variance of outcome on skill development ($R 2 = 0.467$).

4. This indicates that personalized training by way of AI is a productive way of faculty development.

5. The regression coefficient (B = 0.758) of AI-Based Personalized Learning tends to have a substantial effect since increasing 1 unit of personalized AI learning has a 0.758-point positive impact on upskilling results.

6. With an R quasi-square of 0.430, the meaning is that AIS-Supported Digital Pedagogy explains 43.0 per cent of the reliance on the dependent variable.

7. This underscores that the insertion of AI in the digital teaching apps empowers faculty skills and adjustments.

8. Pedagogically, the importance of AI-supported pedagogy is also confirmed by its regression coefficient (B = 0.732).

9. All three hypotheses (H 1, H 2, H 3) were statistically significant with p-value < 0.001 and supported the idea that AI elements can boost the skills of faculty members in higher education.

10. The results indicate that the AI tools can not only help with delivering the material, but also directly facilitate the development of their faculty members when it comes to the digital working environment.

Suggestions

1. To be able to fulfil the promises of AI and its associated platforms, tools, and applications in their teaching and learning processes, a regular and equal access to AI-based platforms, tools, and applications should be ensured to faculty members of Higher Education Institutions (HEIs).

2. This incorporates the measures that include giving high-speed internet, software licenses, as well as friendly AI platforms.

3. Learning institutions must come up with or engage the use of AI-enabled platforms that include personalised training sessions on the foundation of the discipline that the faculty member represents, their level of proficiency, and learning speed.

4. Learning analytics provided by AI will help to control the progress and suggest proper learning materials.

5. Promote the application of AI among faculty in their lesson planning, automated assessment, and analysis of student performance to increase teaching efficiency and student benefits.

6. Arrange regular AI literacy meetings and certifications among the faculty and engage them on real-time use of AI in academics, i.e., use of ChatGPT, AI grading tools, etc.

7. Establish faculty learning communities or AI teaching communities where teachers will be able to discuss their experiences of AI integration tools and strategies.

8. The adoption can be sped up and resistance mitigated by the use of peer-learning models.

9. The management ought to reward or motivate the innovators of AI-based teaching or the early adopters.

10. Allocate some time and resources exclusively to upskilling operations with the aid of AI.

11. Construct an AI-assisted feedback cycle that allows faculty members to get some inspiration on how to improve their practice, what deficiencies exist, and how the consultant might support the improvement over time.

Conclusion

The study demonstrates the persuasive influence of Artificial Intelligence (AI) in the upskilling and reskilling of faculty members at Higher Education Institutions (HEIs) and particularly in the digital workplace. The results of the analysis of the three essential variables of accessibility of AI tools, AI-based personalized Learning, and AI-based digital pedagogy show that they significantly strengthen the positive effect on the outcome of the faculty development. AI becomes much more than a tool of the digital revolution as HEIs find themselves in a constant state of adaptation towards the changes in digital progress. Creating the right to use AI tools, with the recommended inclusion of individual learning tracks and their shared pedagogical approaches with the help of AI, is also pivotal toward increasing professionalism among teachers. These findings confirm that institutes that adopt AI have a higher chance of empowering the faculty and eventually ensuring that the quality of teaching, as well as student learning, will be optimized in the era of digitization. As such, the AI-informed and well-researched implementation of faculty development programs is also overdue and is necessary to support an agile and future-ready academic workforce.

Future scope of the study

This paper identifies research gaps that will be useful in the continued study concerning the introduction of Artificial Intelligence in faculty preparations in institutions of higher Learning (HEI). To begin with, the present study dwells on three particular variables related to AI, but further research could deal with other aspects, like AI-assisted tools of assessment, adaptive learning algorithms, virtual teaching assistants, and generative AI content creation, so that it could be used in teaching. Second, it is possible to organize longitudinal studies that will help to analyze the long-term effect of AI-enabled upskilling programs on the performance of faculty members, curriculum innovation, and student performance over time.

Moreover, comparisons should be made between various types of institutions (between the Segmentation of public and private institutions and /or urban and rural, or discipline-wise Segmentation). This gives more insight into the institutional context, challenges, and opportunities. It is also possible to look into the challenges faced by the faculty in adopting AI, which could include change resistance, training, and ethical issues, and could not be examined due to the scope of this study. Moreover, the research may be expanded beyond a specific country or education system to provide an international perspective on the presence of AI in higher education. Lastly, it can be helpful to incorporate qualitative data collection (interviews or focus groups) into the study scope to provide more in-depth information on faculty experiences, beliefs, and actual practices concerning learning and teaching tools surrounded by AI.

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