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Artificial Intelligence: A Catalyst, Leveraging Enhanced IT Integration In DDU Gorakhpur University, Gorakhpur – Opportunities, Outcomes And Challenges

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ABSTRACT –

This is exploratory study on the impact, adoption and sustainability of Artificial Intelligence in DDU Gorakhpur University, Gorakhpur. The way that students learn, teachers instruct, and educational institutions manage resources has all changed as a result of artificial intelligence (AI). Predictive analytics, improved accessibility, administrative efficiency, and individualized learning are just a few of the ways AI is being used in education. This essay examines the advantages, difficulties, and prospects of artificial intelligence as it relates to the educational system in DDU Gorakhpur University. The paper seeks to demonstrate the significance of AI in promoting a fair, accessible, and successful educational environment by looking at concerned case studies, recent research, and practical applications.

Artificial Intelligence (AI) becomes a vital tool for innovation and adaptation in response to new demands and difficulties as education rapidly changes. The various needs of students and the operational complexity of educational institutions present challenges for traditional teaching and learning approaches. A tailored, data-driven strategy that improves educational experiences is made possible by AI-powered technologies. The purpose of this article is to examine the role of AI in education and evaluate how its incorporation can enhance learning outcomes and accommodate a range of learner needs in DDU Gorakhpur University.

Literature Review

Over the past five years, the use of artificial intelligence (AI) in higher education (HE) has rapidly increased, and new AI tools have proliferated in tandem (Chu et al., 2022). Scholars report on the benefits of AI for HE instructors and students (e.g., Chen et al., 2020; Crompton et al., 2020, 2021). These advantages include using AI in higher education to create assessments (Baykasoğlu et al., 2018), provide personalized prompt feedback (Dever et al., 2020), adjust instruction to the needs of various learner types (Verdú et al., 2017), and forecast academic success (Çağataylı & Çel-ebi, 2022). These studies aid in educating teachers about the potential applications of artificial intelligence in education (AIEd) in postsecondary education.

Nonetheless, researchers have identified a knowledge gap about the collective affordances offered by the application of AI in HE (Hrastinski et al., 2019; Zawacki-Richter et al., 2019). In order to present a current, comprehensive evaluation of the application of AI in the HE setting, this study aims to examine existing research from 2016 to 2022.

With the rise of popular online apps, cellphones, and even home appliances, artificial intelligence (AI) is permeating many facets of our daily life. AI is a quickly developing topic in education, and it has the potential to significantly expand and improve teaching and learning in higher education (Crompton et al., 2020). The

term artificial intelligence (AI) refers to "computer systems that can perform human-like tasks like learning, adapting, synthesizing, self-correcting, and using data for complex processing tasks" (Popenici & Kerr, 2017). AI is one of six technologies having the potential to have a significant impact on higher education, according to the Horizon Report 2020 report (Brown et al., 2020). Every year, the Horizon Report (2020) looks at the key developments in educational.

Research Objective

There is a need to improve academic knowledge in AIEd because the area is expanding and changing quickly. Researchers have highlighted the need to further understand the effectiveness of AIEd in educational settings (Hrastinski et al., 2019; Zawacki- Richter et al., 2019). This study aims to address the call from researchers (Chu et al., 2022; HinojoLucena et al., 2019; Zawacki Richter et al., 2019) to examine the advantages and difficulties of AIEd in DDU Gorakhpur University.

Hypothesis

On the basis of above, the paper is guided by the following **two hypotheses** for which:

1. The effective and efficient management of student Personalized and adaptive learning with accessibility resulting into low rate of dropouts, reduced time spent on administrative tasks, improved student engagement, enhanced student learning outcomes, Quality research work, productive faculty teaching with updated contents and effective administrative functions are directly correlated to the effective and efficient application of Artificial Intelligence.
2. Improper or unethical application of Artificial intelligence (AI) significantly correlates with increase in plagiarism and cheating rate, students becoming overly dependent on technology, lack of professional development, emerging cyber threat.

Research Methodology

3.1 Research Design

This study employs a mixed-methods approach:

- **Quantitative Analysis:** Survey done for measuring uses, benefits and challenges, efficiency gains, and adoption rates of AI in DDU Gorakhpur University, Gorakhpur
- **Qualitative Analysis:** Interviews done with students, administrators, faculty, and IT managers to gather insights into the portal's usability and challenges.

3.2 Data Collection

- Target group: Primary data was gathered through structured questionnaires where 250 respondents of DDU Gorakhpur University, Gorakhpur were analyzed. Among them 165 were students, 50 were faculty members, 15 were office staff and 20 were IT Professionals of the concerned University.
- Secondary data from government reports, academic papers, and policy documents.

Artificial intelligence

Artificial intelligence is not a brand-new term. McCarthy (Cristianini, 2016) first used it in 1956 as a follow-up to Turing's work (e.g., Turing, 1937, 1950). Turing explained how intelligent thought and reasoning may be included into machines. Since 1956, as AI capabilities have advanced significantly, the definition of AI has expanded and evolved. According to Popenici et al. (2017), p. 2, artificial intelligence is now defined as "computer systems that are able to engage in human-like processes such as learning, adapting, synthesizing, self-correction, and the use of data for complex processing tasks." It may be difficult to define AI because of the interdisciplinary interest of researchers from linguistics, psychology, education, and neuroscience who relate AI to terms, ideas, and understanding in their respective fields. As a result, it is now necessary to classify AI into distinct disciplinary areas. The category of AI in Education (AIEd) and its particular use in higher education settings are the main topics of this study.

Usage of Artificial Intelligence in Higher Education system

AI's ability of personalize learning, increase production and boost administrative efficiency is having a quick impact on the educational system. According to a recent Microsoft survey, a sizable portion of teachers and students use AI to make work easier. Following are the data drawn from survey analysis-

- 77% of students use AI to brainstorm and synthesize ideas.
- 62% of teachers use AI to create lesson plans. Only 56% of teachers actively use it, despite the fact that 77% of them are aware of its potential. (Low participation of teachers is because of inadequate training and worries about student abuse, such as cheating.)
- 47% of administrators use AI in administrative procedures to increase student engagement and streamline operations.

AI is facilitating a change toward individualized academic support and differentiated education, which could make learning more dynamic and responsive to the demands of each individual student. It is advised that leaders and educators begin with small AI projects, concentrating on achievable applications, and then progressively growing as they gain integration resources and confidence.

Education leaders are generally bullish about AI. According to the State of EdTech District Leadership survey by the Consortium for School Networking,

- 97% of respondents believe AI can have a beneficial impact on education.
- Despite of high level of confidence, districts are lagging behind in terms of AI implementation; just 35% of districts say they have a generative AI initiative in place.

Lack of knowledge about AI could be another factor contributing to reluctance.

Use of Artificial Intelligence in higher education -

1. Research Assistance	**2. Study & Learning Support**	**3. Writing & Editing Help**	**4. Code & Technical Help**	**5. Exam Preparation**	**6. Career & Academic Guidance**
Summarizes academic papers and articles.	Explains difficult topics in simple terms.	Assists in drafting essays, reports, and research papers.	Debugs and explains code.	Creates quizzes and mock tests.	Suggests universities and courses.
Provides explanations of complex concepts.	Creates customized study plans.	Suggests improvements in grammar, clarity, and structure.	Helps with programming assignments.	Summarizes key points for revision.	Helps with Curriculum design, SOPs (Statement of Purpose) and resumes.
Suggest relevant sources and research directions.	Helps with problem-solving in subjects like math, science, and engineering.	Generates citations and bibliography in different formats (APA, MLA, etc.).	Provides algorithmic and data structure insights.	Generates flashcards for memorization.	Guides on scholarships and funding opportunities.

Findings and Discussion

Brighter side of Artificial Intelligence in Education system in DDU Gorakhpur University

Table 1.1: AI is useful in higher studies

AI is useful in higher studies	Frequency	Percentage
Yes	177	70.8
No	73	29.2
	250	100

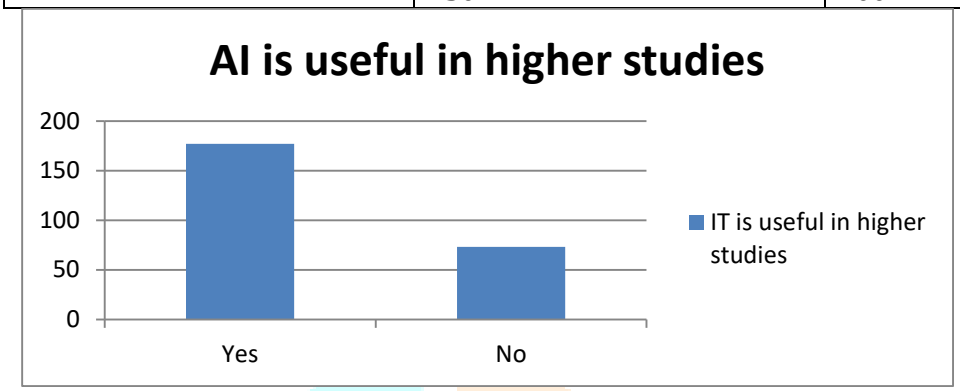


Figure 1.1: AI is useful in higher studies

The presented data articulates respondents' perspectives on the utility of Artificial Intelligence (AI) in DDU Gorakhpur University. 80% of the surveyed individuals affirm the affirmative stance, expressing that AI is indeed beneficial in the context of higher education. These findings have implications for educational institutions, policymakers, and technology integrators, highlighting the importance of leveraging AI tools and platforms to enhance the quality, accessibility, and overall effectiveness of higher education.

Table 1.2: AI Plays vital role in improving knowledge, skills and abilities of students and faculty members

AI Plays vital role in improving knowledge, skills and abilities of students and faculty members	Frequency	Percentage
Strongly Agree	98	39
Agree	60	24
Neither Agree Nor Disagree	42	17
Disagree	30	12
Strongly Disagree	20	8
	250	100

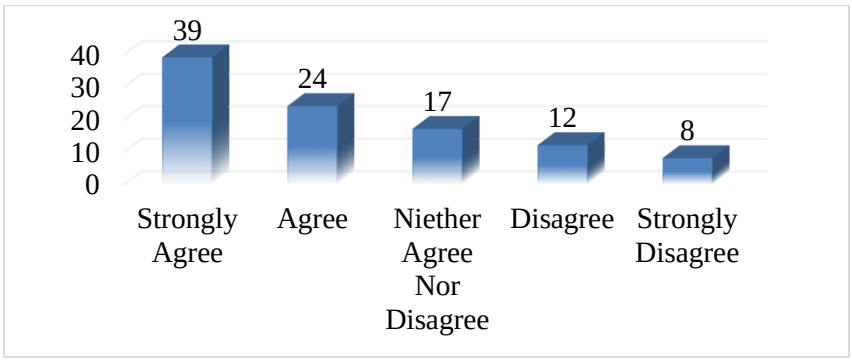


Figure : examines the perceptions of the surveyed population regarding the role of Artificial Intelligence (AI) in improving knowledge, skills, and abilities of students and faculty members. The data indicates a significant agreement, with 63% agreeing that AI plays a vital role in enhancing faculty members' and students knowledge, skills, and abilities. Meanwhile, 17% neither agree nor disagree, indicating a level of neutrality or uncertainty among respondents. On the contrary, 20% disagree with the statement, forming a minority within the sample.

These findings suggest a prevailing belief within the surveyed population that AI is instrumental in supporting students and advancing the professional growth and capabilities of faculty members in DDU Gorakhpur University.

1.3 Personalized Learning using AI

AI's ability to customize the learning process is among its most important educational advances in DDU Gorakhpur University. Content, tempo, and teaching strategies are all adjusted for each student's preferences, learning preferences, and ability level through personalized learning. AI enables educational platforms to dynamically modify learning routes, providing students with personalized tasks, exercises, and evaluations based on performance analysis in real time.

Table 1.3: AI has increased access of personalized information to everyone

AI has increased access of personalized information to everyone	**Frequency**	**Percentage**
Yes	187	75
No	63	25
	250	**100**

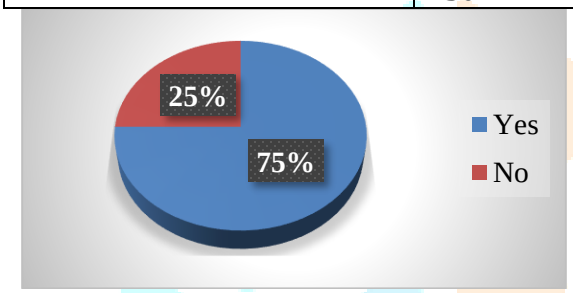


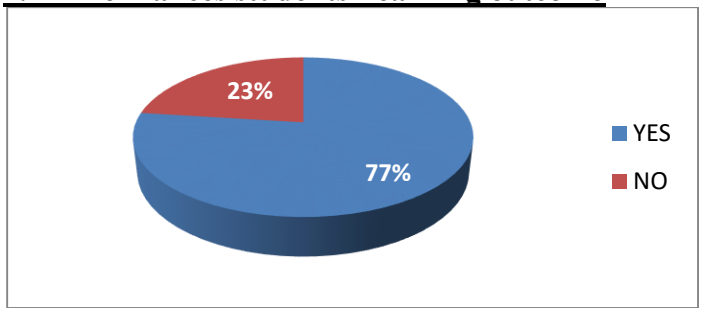
Figure1.3 :AI has increased access of personalized information to everyone

Table provides insights into the perceptions of the surveyed population regarding the impact of Artificial Intelligence (AI) on the accessibility of personalized information in DDU Gorakhpur University. A significant majority, comprising 75% of respondents, acknowledges that AI has indeed increased access to personalized information for everyone. It ensures that the benefits of AI are accessible to all, contributing to a more equitable and knowledge-driven society.

1.3.1 Platforms for Adaptive Learning

AI algorithms are used by adaptive learning platforms to examine student data, including quiz results, completion times, and interaction trends. Companies like DreamBox and Khan Academy, for example, employ AI to adjust class difficulty, give real-time feedback, and make sure students aren't overworked or under challenged. According to research, because AI allows for a highly customized approach, students who use adaptive learning platforms typically perform better and retain material longer.

1.4 AI enhances students' learning outcome



77% noted AI benefits in enhancing student learning outcomes.

1.5 Improved Engagement and Administrative Support: AI streamlines administrative duties and improves operational efficiency, which optimizes educational administration beyond individualized learning. It includes assistance in admission process, fees collection, conduction of exams, placements, faculty recruitments, curriculum designing, conducting different courses and other administrative functions.

78% respondents of DDU Gorakhpur University reported benefits related to improve student engagement and Administrative support. Personalized learning systems increase student engagement by up to 42%, fostering a tailored educational experience. For example, platforms using AI alerts can detect when students start falling behind and recommend appropriate resources or connect them with advisors.

- AI enhances resource management, decreases operational costs and energy consumption.
- AI based accessibility tools improve learning outcomes for students opting distance learning or are with disabilities.
- AI powered adaptive testing improves student performance on standardized exams.
- AI Helps with Differentiated Learning and Productivity
- 42% found that using AI reduced the time spent on administrative tasks.

1.5.1 Automated Evaluation and Grading

AI frees up teachers to concentrate on more complex instruction and specialized support by automating the grading of multiple-choice and even some short-answer questions in DDU Gorakhpur University. Machine learning is used by programs such as Gradescope to accurately grade student work, giving students prompt feedback and saving teachers a great deal of time.

1.5.2 Student Performance Predictive Analytics

Predictive analytics powered by AI can foresee the needs and possible difficulties of students. For instance, IBM's Watson Education provides information on students' learning paths, enabling teachers to proactively provide at-risk pupils with specialized support. Through the identification of disengagement or difficulty tendencies, such analytics can lower dropout rates and increase retention.

1.6 Reduction in Dropout Rates: 77% of respondents agree that AI-based tools are an unavoidable development in technology. AI-powered systems can reduce dropout rates by up to 30%. This is achieved through early identification of struggling students, leveraging data on attendance, grades, and engagement to proactively offer interventions and supporting Distance Learning education system.

1.7 Most educators (84 percent) believe that all users should be trained to utilize them ethically, and they should be used constructively. Teachers are under pressure to fulfill all of their professional obligations, which include running the classroom, assigning grades, creating lesson plans, interacting with parents and families, and fulfilling administrative procedures. These urgent teaching needs can be effectively met by generative AI. 76% of survey respondents believe that to address their application, teachers must complete their professional development requirements.

1.8 Using AI to Increase Inclusivity and Accessibility of education

AI is essential to ensure that students with impairments and those living in rural or underdeveloped locations may access education.

1.8.1 Technologies for Assistive

Students with disabilities can receive learning support through assistive technologies driven by artificial intelligence. To assist students with vision or hearing impairments, Google's Lookout app and Microsoft's Immersive Reader, for example, use machine learning to provide text-to-speech, speech-to-text, and screen reading features. Students with special needs can learn alongside their peers thanks to these resources, which support inclusive classrooms.

1.8.2 Cultural Inclusion and Language Translation

Language barriers are removed by AI-powered language translation systems, making learning resources accessible to non-native speakers. International students benefit from a more welcoming environment thanks to resources like Google Translate and AI-powered language coaches.

AI translation creates previously unattainable learning chances in areas with a shortage of teachers and resources.

1.8.3 Increases Motivation and Involvement

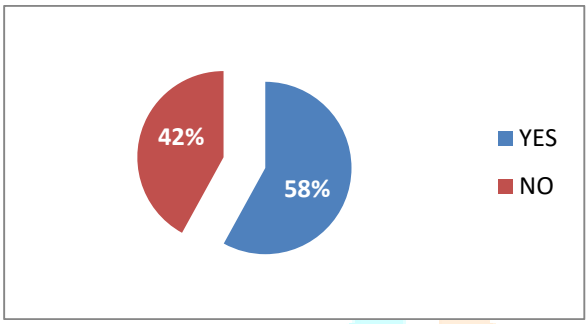
Because students receive content that is relevant to their interests and level of understanding, personalization increases student engagement. Game mechanics and AI analytics are incorporated into AI-powered gamified learning environments, like Classcraft, which increase motivation and foster a fun learning environment. This

involvement is essential since research indicates that academic achievement and motivation are strongly correlated, particularly in online and mixed learning environments.

Challenges or Risks associated

The two main issues are student cheating and AI training. Although there are many benefits to employ AI, educators are also wary of the technology. However, teachers who use generative AI are still concerned about students taking shortcuts:

AI promotes plagiarism and cheating



- 58% of respondents of DDU Gorakhpur University, Gorakhpur agree the most common concerns plagiarism and cheating,
- 64% are worried about students becoming overly dependent,
- and 35% of respondents of DDU Gorakhpur University, Gorakhpur agree lack of professional development or guidance on how to use these tools faithfully and safely.
- 53% of those who have not used generative AI tools express even greater anxiety about the necessity of professional growth in order to apply the technology faithfully and responsibly.

Microsoft respondents also expressed concerns regarding classroom integration and training, with 50% citing a lack of assistance and training as the main obstacle.

In response to CoSN's question regarding the greatest risks associated with AI,

- 63% respondents expressed concern about emerging cyberthreats,
- And 49% mentioned a lack of teacher preparation for incorporating AI into the classroom.

With 20% of respondents stating that they had experience working in districts that employ tools to identify AI-generated responses in student work, CoSN instructors are not without this concern. This is undoubtedly a major issue for educators, involving a difficult area of moral dilemmas for which there are no simple solutions.

AI's Difficulties and Ethical Issues in Education AI in education presents a number of practical and ethical issues despite its advantages. To avoid misuse and privacy violations, student data must be handled carefully while using AI-driven data collecting.

Security and Privacy of Data

Sensitive student data collected by AI tools must be protected by educational institutions. Inappropriate handling or illegal access to sensitive data may result in security threats and privacy violations. To preserve students' and teachers' safety and trust, data protection policies and regulations are crucial.

AI Algorithms' Bias and Fairness

Bias can still affect AI systems. Algorithms that have been trained on biased data may favor particular populations or reinforce preconceptions. Making sure AI systems are developed and supervised to support equity and inclusion is essential. This means integrating a variety of datasets, conducting frequent algorithm audits, and being open and honest with all parties involved.

Suggestions/ Recommendations

To actualize AI utilization tools and skills in Indian schools & colleges the following recommendations were made:

1. **Enhancing Training Programs:** Teachers of DDU Gorakhpur University need to receive training on how to successfully use AI technologies into their lesson plans so they may fully and ethically realize AI's promise.
2. **Expanding Connectivity:** DDU Gorakhpur University administration should focus to improve internet infrastructure in whole campus.

3. **Customizing Features:** Adapt portal functionalities to specific DDU Gorakhpur University needs.
4. **Strengthening Data Security:** Enhance cybersecurity measures to safeguard sensitive information.
5. AI installation and maintenance of its facilities is cost intensive, therefore state government should vote special fund and invest honestly for successful utilization by both students and teachers.

Enhancing Training Programs

1.1 Free and compulsory AI services should form part of student's general studies programs in DDU Gorakhpur University

- Free and compulsory AI services should form part of students general studies programs in higher institutions of learning to provide students with practical and functional knowledge of computer, the internet and associated areas of AI.

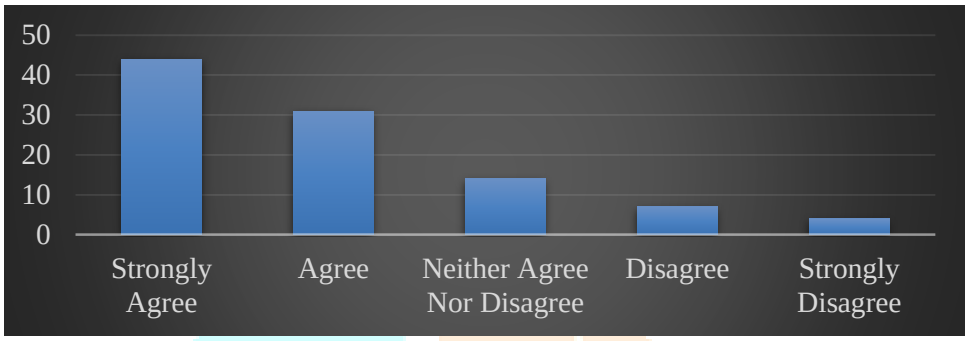


Figure: Free and compulsory AI services should form part of student's general studies programs in higher institutions

Above reveals a strong consensus, with 75% sample population in agreement (44% strongly agree and 31% agree) on the integration of free and compulsory Artificial Intelligence (AI) services into general studies programs in higher institutions. These findings highlight the widespread recognition of AI literacy as crucial in higher education, urging institutions and policymakers to consider the implementation of free and compulsory AI services to ensure students are well-equipped with essential digital skills.

1.2 Table: Basic knowledge of computer should be a pre-requisite condition for award of any degree

	Frequency	**Percentage**
Strongly Agree	107	43
Agree	70	28
Neither Agree Nor Disagree	38	15
Disagree	25	10
Strongly Disagree	10	4
	250	**100**

Table: Basic knowledge of computer should be a pre-requisite condition for award of any degree

The data presented reflects the opinions of individuals regarding the proposition that a basic knowledge of computers should be a prerequisite for the award of any degree. The majority of respondents, comprising 71%, agree with this statement, indicating a widespread belief in the importance of computer literacy in today's academic landscape. Overall, the data suggests a prevailing consensus in favor of requiring basic computer knowledge for obtaining a degree.

1.3 Students at all levels should be provided with basic concept of AI by the trained teachers.

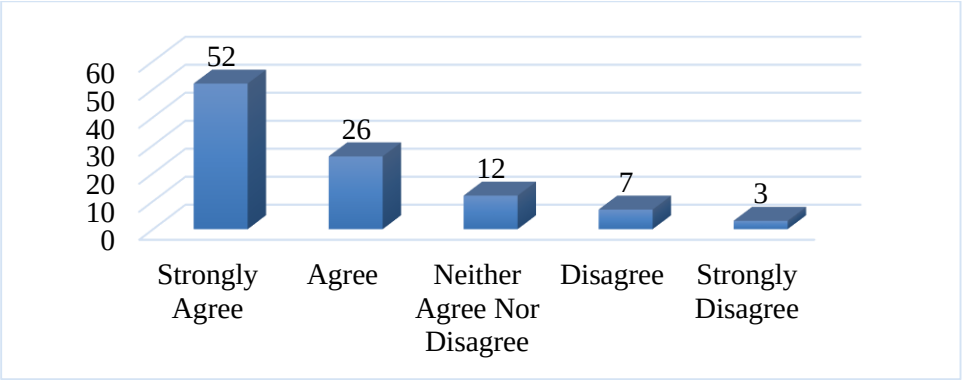


Figure :Students at all levels should be provided with basic concept of AI by the trained teachers

The data presented indicates a strong inclination towards the belief that students at all levels should be equipped with a basic understanding of Artificial Intelligence (IT) by trained teachers. A significant majority of respondents, comprising 78%, agree with this proposition, emphasizing a widespread consensus on the importance of integrating AI concepts into the education curriculum. In summary, the data underscores a prevailing consensus in favour of integrating AI education into various academic levels, with a smaller but notable portion expressing reservations or disagreement on this matter.

1.4 All employed teachers in public schools at all levels should undertake mandatory training

	Frequency	**Percentage**
Strongly Agree	108	43
Agree	80	32
Neither Agree Nor Disagree	32	13
Disagree	20	8
Strongly Disagree	10	4
	250	**100**

Table : All employed teachers in public schools at all levels should undertake mandatory training

The data reveals a substantial consensus among respondents regarding the proposition that all employed teachers in public schools, irrespective of the educational level, should undergo mandatory training. A significant majority, constituting 75% of respondents agree with this proposal, underscoring a widespread belief in the necessity of continuous professional development for teachers. In summary, the data highlights a prevailing consensus in favor of implementing mandatory training for teachers in public schools, with a smaller but significant portion expressing reservations or disagreement on this matter. All employed teachers in public schools at all levels should undertake mandatory training of computer programs to provide them with practical and functional knowledge of computer, internet etc.

- The training focusing AI should be in form of conferences, seminars and workshops to prepare teachers for information Age and competitiveness of the 21st century.
- Administrators, teachers and students of DDU Gorakhpur University need to be computer literate so as to be able to apply computer to administrative functions, teaching and learning.

Conclusion

Unquestionably, artificial intelligence has an impact on contemporary education in DDU Gorakhpur University, from improving accessibility and personalizing instruction to boost operational effectiveness. As AI technology develops, AI presents several chances to enhance learning outcomes, foster inclusive settings, and facilitate customized learning experiences. To fully utilize AI's potential in a responsible and fair way, however, issues with algorithmic bias, ethics, and privacy must be addressed. Educators and politicians may influence an educational future where AI is a potent instrument for empowerment and innovation by putting ethical norms first and putting well-designed AI systems into place in DDU Gorakhpur University.

Limitations and Future Research

- This study has limited regional focus (DDU Gorakhpur University) and this could impact the findings.
- Future research directions can be longitudinal studies to assess AI's impact on sustainable education over decades.

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