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Artificial Intelligence Adoption in Higher Education: Its Impact on Teachers' Research Productivity, Students' Learning Outcomes, and Administrators' Efficiency in Assam

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ABSTRACT: Artificial Intelligence (AI) is increasingly influencing higher education by introducing new possibilities for academic research, teaching and learning, and institutional administration. However, the extent to which these developments are reflected in the experiences of higher education stakeholders varies across institutions and individuals. Against this background, the present study examines the perceived impact of AI adoption on teachers' research productivity, students' learning outcomes, and administrators' efficiency in higher education institutions in Assam. The study adopted a descriptive survey research design using a quantitative approach. A total of 507 respondents, comprising 135 teachers, 341 students, and 31 administrators, were selected from higher education institutions across five divisions of Assam through stratified and random sampling procedures. Data were collected using three researcher-developed impact assessment tools designed separately for teachers, students, and administrators. The instruments employed a five-point Likert-type scale, and their reliability coefficients, determined through the test–retest method, were 0.68 for teachers, 0.71 for students, and 0.71 for administrators. The collected data were analysed using descriptive and inferential statistical techniques, as appropriate to the research objectives. The findings revealed that the perceived impact of AI was predominantly moderate across all three stakeholder groups. Among teachers, 85.93% reported a moderate impact on research productivity, while 11.11% reported a high impact and 2.96% reported a low impact. Similarly, 86.80% of students perceived a moderate impact of AI on their learning outcomes, whereas 12.32% reported a high impact and 0.88% reported a low impact. Among administrators, 77.42% reported a moderate impact on administrative efficiency, 12.90% reported a high impact, and 9.68% reported a low impact. These findings suggest that AI is perceived as a useful supportive resource in higher education, although its transformative potential has not yet been fully realised for most respondents. The study highlights the importance of systematic AI training, improved technological infrastructure, institutional support, and responsible-use guidelines to facilitate more effective integration of AI into higher education in Assam. It is expected that the findings will provide useful insights for educational policymakers, institutional administrators, teachers, and other stakeholders seeking to promote effective, equitable, and responsible AI adoption in the higher education sector.

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INTRODUCTION

Artificial Intelligence (AI) has profoundly impacted numerous facets of modern life in the 21st century, yielding a profound influence on the way we live, work, and interact. AI has the potential to completely change and improve many facets of our life, including our work settings and general well-being, as a transformative instrument. According to Górriz, J. M., Ramírez, J., & Ortíz, A., et al. (2020), the strategic integration of AI can significantly enhance and advance the working culture, as well as various sectors that contribute to our overall quality of life, ultimately leading to improved productivity, efficiency, and happiness. Furthermore, AI is transforming the education sector and has a profound impact on both social and economic aspects of our lives. According to Kuka, Hörmann, and Sabitzer (2022), the introduction of AI in education sector is creating a new landscape, where the ability to effectively utilize technology, think critically, and solve complex problems is becoming essential for success in an increasingly digital world.

The application of AI in institutions of higher learning possesses the capacity to bring about a change in the way that education is provided, making it more inclusive, customized to persons desires, and streamlined. Using AI, educational institutions can revitalize their teaching and learning methodologies, ultimately leading to enhanced accessibility, personalization, and efficacy. The increasing adoption of AI in higher education has already begun to transform various administrative, instructional, and learning processes, underscoring the need for stakeholders, including students, educators, and administrators, to develop a comprehensive understanding of AI. In addition to encouraging creativity and enabling people to make well-informed decisions, this knowledge guarantees that educational systems are sufficiently prepared to meet the opportunities and challenges of the AI-driven future. Research conducted by (Chatterjee & Bhattacharjee, 2020) delves into the multifaceted role of AI in higher education, with a particular emphasis on the dimensions of awareness, accessibility, and impact among stakeholders. Their findings suggest that the adoption of AI in higher education institutions of India presents a dual scenario, characterized by both problems as well as opportunity. The successful adoption of AI is poised to revolutionize governance, teaching, and learning, while also facilitating more informed decision-making. Furthermore, the rapid expansion of higher education has resulted in increased workloads, rendering the adoption of AI crucial for efficient management and optimal resource allocation.

Furthermore, India's higher education system, known for its expansive and heterogeneous nature, reflects the nation's intricate sociohistorical fabric. Over the decades, the system has undergone a dynamic evolution, responding to shifting societal demands and global educational paradigms. Comprising a multitude of universities, colleges, and specialized institutions across diverse geographical and cultural regions, the Indian higher education landscape requires innovative approaches like those offered by AI to tackle increasing workloads and enhance resource allocation (Choudaha & Chang, 2012).

1.1. The Impact of Generative AI on Higher Education Learning and Teaching

Generative AI is reshaping higher education by transforming both learning and teaching practices through a variety of innovative tools. For example, platforms like ChatGPT offer students personalized writing assistance and interactive tutoring, allowing them to explore complex topics through natural language conversations. Similarly, educators use tools like Jasper and Copy.ai to generate creative content for lectures, assignments, and course materials, streamlining lesson planning processes. Visual generative models such as DALL-E or Midjourney enable the creation of illustrative graphics and educational visuals that cater to diverse learning styles, making abstract concepts more tangible. These tools not only enhance student engagement by providing adaptive learning experiences, but they also aid instructors in reducing administrative workload, fostering a more interactive and creative classroom environment. The relationship between Artificial Intelligence (AI) and pedagogy is deeply intertwined, with AI exerting a profound influence on both the pedagogical approaches used to teach AI-related concepts and the broader impact of AI on the teaching-learning process. As AI continues to evolve, it is essential to consider the implications of this evolution on pedagogy, including the need for instructors to adapt and develop new skills to effectively integrate AI into their teaching practices. According to Toksha, Kulkarni, and Gupta (2022), the importance of AI in pedagogical approaches is underscored by shifting educational landscapes, such as the increasing emphasis on student-centric learning, the rapid pace of technological advancements, and the growing demand for skills that are relevant in an AI-driven world. As a result, educators must be willing to embrace new pedagogical strategies, such as personalized learning, adaptive assessments, and collaborative learning environments, to ensure that students are equipped with the knowledge, skills, and competencies required to thrive in a rapidly changing world.

The AI powered tools like ChatGPT, a sophisticated deep learning model, is transforming the higher education landscape by generating content that mimics human-like qualities. However, this development also raises important concerns about academic

integrity, the potential for plagiarism, and the impact on critical thinking skills. In response to these challenges, a recent study conducted by (Michel-Villarreal, R., et. al., 2023) employed a thing ethnography approach to investigate the benefits and limitations of ChatGPT in academic settings. The researchers identified the need for clear guidelines and frameworks to ensure the responsible integration of ChatGPT and similar AI systems, as well as the importance of empirical research to understand user experiences and perceptions. The study's findings have significant implications for future research on the role of ChatGPT and other AI-powered tools in higher education, highlighting the value of thing ethnography as a methodology for engaging with and understanding the complexities of intelligent AI systems.

Moreover, application of a chatbot in higher education has shown promising results in enhancing student academic performance. (Essel, H.B. et. al., 2022) investigate the impact of a chatbot on student learning outcomes, and their findings revealed that students who interacted with the chatbot outperformed those who received instruction from a course instructor. This study makes a significant contribution to the growing body of literature on AI chatbots in education, and is particularly notable as it is the first of its kind in Ghana to utilize a chatbot to engage undergraduate students.

The chatbot tools, such as ChatGPT, has sparked a mix of excitement and trepidation among students, as they navigate the vast potential of these innovative technologies to enhance their learning experiences. While many students acknowledge the benefits of leveraging these tools to support their academic pursuits, a substantial number are instead utilizing them for non-academic purposes, driven by a complex array of concerns. These concerns include the risk of violating academic policies, the potential for excessive reliance on technology, the loss of original thought and creativity, and the exposure to security threats that can compromise their personal and academic integrity.

Introduction of ChatGPT (a paradigm-shifting generative AI tool) has precipitated a seismic shift in the educational landscape, prompting a nuanced re-evaluation of the complex interplay between technology, pedagogy, and learning. As educators navigate the uncharted terrain of AI-mediated instruction, the dichotomy between the potential benefits and drawbacks of ChatGPT has become increasingly apparent, underscoring the need for a conceptual framework that can reconcile the tensions between innovation and tradition. On one hand, ChatGPT's capacity for personalized and interactive learning, formative assessment, and ongoing feedback has the potential to revolutionize the educational experience, enabling a more student-centred, adaptive, and responsive approach to teaching and learning. Teachers can build a more dynamic, inclusive, and productive learning environment that meets the various needs and skills of students by utilising AI's affordances. This will help to establish a more just and equitable educational ecosystem. The drawbacks and difficulties of ChatGPT, however, such as the possibility of false information, biases in data training, and privacy issues, serve as a sobering reminder of the necessity of careful thought, moral consideration, and strategic planning when integrating AI in the classroom. The tension between the potential benefits and drawbacks of ChatGPT highlights the importance of developing a conceptual framework that can navigate the complexities of AI-mediated instruction, balancing the need for innovation and progress with the imperative of ensuring academic integrity, rigor, and responsibility.

In this context, the study by (Baidoo-Anu, D., & Ansah, L. O.; 2023) serves as a clarion call for a collaborative and multidisciplinary approach to harnessing the potential of ChatGPT in education, one that brings together policymakers, researchers, educators, and technology experts to co-create a future where AI is used to enhance, rather than undermine, the educational experience. By fostering a culture of innovation, experimentation, and critical reflection, educators can unlock the transformative potential of ChatGPT, creating a more just, equitable, and effective educational system that prepares students for success in an increasingly complex, interconnected, and rapidly changing world.

Significance of the Study

significant aspect of this study is its focus on the impact of AI on teaching, learning, and administrative processes in higher education. Although global studies have documented improvements in curriculum delivery, personalized learning experiences, and administrative efficiency due to AI, there is a dearth of localized research that examines these impacts within the unique educational landscape of Assam. The study will explore how AI-driven innovations influence pedagogical approaches, curriculum design, and overall student engagement. By identifying specific examples such as improvements in individualized learning or streamlining of academic administrative processes the research aims to provide evidence-based insights that underscore the transformative benefits of AI while also acknowledging the challenges that come with rapid technological integration.

This study aims to create a more nuanced understanding of the role that AI plays in higher education in Assam by focusing on impact. The research aims to provide important insights that will direct future investments, policy-making, and instructional strategies through in-depth analysis and local contextualization, ensuring that the transformative potential of AI is used in the higher education sector of Assam in an efficient and equitable manner.

Statement of the Problem

Higher education is changing due to the quick uptake of artificial intelligence (AI), which has an impact on administration, research, teaching, and learning. However, nothing is known about the scope and effects of AI use in the higher education institutions of Assam. In particular, it is necessary to investigate if AI improves the efficiency of administrators, students' learning outcomes, and professors' research output as well as the obstacles to its successful application. Thus, the current study aims to examine the use of AI in Assamese higher education institutions and evaluate its effects on these three crucial aspects.

Objectives of the Study

Based on the Objectives of the study the research used the following objectives-

1. To measure and evaluate the impact of AI integration on research productivity of teachers in higher educational institutions of Assam
2. To measure and evaluate the impact of AI integration on learning outcomes of students in higher educational institutions of Assam
3. To measure and evaluate the impact of AI integration on administrative efficiency of administrators in higher educational institutions of Assam.

Research Questions used in the Study

Based on the objectives of the study the following research questions were used in the study-

1. What is the perceived impact of AI integration on research productivity of teachers in higher educational institutions of Assam?
2. What is the perceived impact of Artificial Intelligence on students' learning outcomes in higher education institutions in Assam?
3. What is the perceived impact of AI integration on administrative efficiency of administrators in higher educational institutions of Assam?

Literature Reviewed

With applications in teaching, learning, research, assessment, student support, and administration, artificial intelligence (AI) is becoming a significant part of higher education, according to the reviewed literature. Studies by Zawacki-Richter et al. (2019), Roll and Wylie (2016), and Crompton and Burke (2023) demonstrate the expanding use of AI in areas like intelligent tutoring, personalized learning, assessment, prediction, and administrative services.

Numerous research has demonstrated how AI can enhance students' learning results and experiences. According to Jain and Jain (2019), Ouyang et al. (2022), Hooda et al. (2022), and Rahiman and Kodikal (2023), AI can help with academic performance, timely feedback, assessment, and personalized learning. According to studies by Alimi et al. (2021), Kelly et al. (2023), Delello et al. (2023), and Johnston et al. (2024), students are becoming more conscious of and utilizing AI tools, but there are still challenges with academic integrity, ethics, employment, and responsible use.

AI has also been studied from the viewpoint of educators and educational establishments. According to Celik et al. (2022), AI can help teachers determine the requirements of their students, design lessons, give feedback, and conduct assessments. The significance of elements including perceived utility, technological preparedness, institutional support, and attitudes in the adoption of AI in higher education was emphasized by Sharma et al. (2024) and Chatterjee and Bhattacharjee (2020).

The literature also lists a number of obstacles to the adoption of AI. Inadequate infrastructure, a lack of technical expertise, privacy and ethical issues, excessive expenses, potential employment displacement, and opposition to technological change are some of these (Venugopal & Mamatha, 2023; Dhawan & Batra, 2020; Zhang & Aslam, 2021). AI can improve digital leadership,

automation, decision-making, and institutional efficiency, according to studies on school administrators. However, successful adoption calls for the right institutional support, regulations, and training.

All things considered, the analyzed research demonstrate that AI has significant potential to change higher education. However, a large portion of the current research focuses independently on the perspectives of students, the use of AI by teachers, or the general applications and difficulties of AI. The combined effects of AI adoption on teachers' research output, students' learning results, and administrators' efficiency have been the subject of relatively little empirical research, especially in the Indian and regional context.

RESEARCH GAP IDENTIFIED

The adoption of AI and its uses in higher education have been the subject of several research, but there is still a great deal to learn about its overall effects on educators, learners, and administrators. The majority of earlier research has focused on AI awareness, perceptions, acceptability, teaching-learning applications, or general problems. The impact of AI adoption on instructors' research productivity, administrators' efficiency, and students' learning outcomes has received little consideration. Furthermore, there is insufficient empirical data regarding the adoption of AI in Assamese higher education institutions. Assam's socioeconomic, technological, institutional, and educational circumstances might have a different impact on the adoption of AI than those in other areas. In order to close this gap, the current study looks at the degree of AI use and how it affects the productivity of instructors' research, the learning results of students, and the effectiveness of administrators in the higher education institutions of Assam.

METHODOLOGY

The present study adopted a descriptive research design of the survey type to investigate the impact of Artificial Intelligence (AI) in higher education in Assam. The study employed a quantitative approach for assessing the perceived impact of AI among stakeholders of higher educational institutions. The target population comprised students, teachers, and administrators of selected colleges and universities in Assam. A total of 507 respondents were selected through a combination of stratified and random sampling procedures from five divisions of Assam, namely Barak Valley, Central Assam, Lower Assam, North Assam, and Upper Assam.

The study comprised a total of 507 respondents, including 135 teachers (26.63%), 341 students (67.26%), and 31 administrators (6.11%) from selected higher education institutions of Assam. The respondents were selected to obtain information regarding the perceived impact of Artificial Intelligence (AI) on teachers' research productivity, students' learning outcomes, and administrators' administrative efficiency. The three categories of respondents were analysed separately according to their respective roles and areas of AI application in higher education.

For assessing the impact of AI, the researcher developed Impact Assessment Tools separately for students, teachers, and administrators with the assistance of subject experts. The tools were designed to measure the perceived effects of AI on students' learning outcomes, teachers' research productivity, and administrators' effectiveness, respectively. The initial draft of the student tool consisted of 17 items, the teacher tool consisted of 18 items, and the administrator tool consisted of 15 items. Following expert review and suggestions, the final versions contained 11, 12, and 12 items, respectively.

The tools followed a five-point Likert-type response format comprising Strongly Agree, Agree, Undecided, Disagree, and Strongly Disagree. Positive and negative statements were scored differently, with scores ranging from 1 to 5. Content validity was established through consultation with subject experts and language experts. Reliability was determined through the test-retest method using the Product Moment correlation technique. The obtained reliability coefficients were 0.71 for the student tool, 0.68 for the teacher tool, and 0.71 for the administrator tool, indicating acceptable reliability.

Data were collected personally from the selected respondents after obtaining necessary institutional permission and informed consent. The collected data were systematically tabulated and analysed using appropriate descriptive and inferential statistical techniques, including percentage, measures of central tendency and variability, t-test, and F-test, as required by the objectives of the study.

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Major Findings of the Study

Impact of Artificial Intelligence on Teachers' Research Productivity in Higher Education Institutions of Assam

Objective-1: To measure and evaluate the impact of AI integration on research productivity of teachers in higher educational institutions of Assam

Research Question- 1: What is the perceived impact of AI integration on research productivity of teachers in higher educational institutions of Assam?

Table- 1: Overall impact of Artificial Intelligence on the teachers in relation to research productivity

Impactful Category	Less (12-28)	Moderate (29-44)	High (45-60)	Total
Respondents	4	116	15	135
Percentage	2.96%	85.93%	11.11%	100%

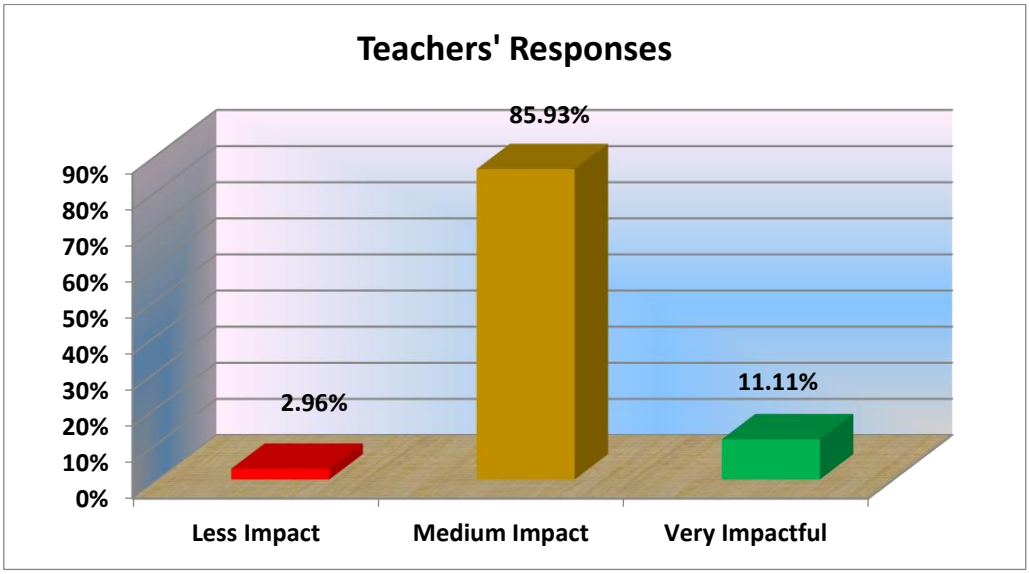


Diagram-1: Showing overall impact of Artificial Intelligence on the teachers in relation to research productivity

Results: The impact of artificial intelligence (AI) on teachers' research output is insightfully analyzed in the table- 1 and diagram-1, which uses a scoring system with a maximum of 60 and a minimum of 12. Based on their perceived impact, teachers are categorized as either Very Impactful (45–60), Moderately Impactful (29–44), or Less Impactful (12–28).

The Medium Impact category, which includes 116 out of 135 responders (85.93%), clearly dominates the statistics. This implies that most educators believe AI has a minimal impact on their ability to do high-quality research. For many, the influence of AI tools and technologies is neither insignificant nor revolutionary, even though they may aid expedite research procedures like literature reviews, data analysis, and insight generation. This finding of the study is found similar to a systematic review by Fu et al. (2024). Thet looked at the integration of AI in various educational environments, including higher education. They have found that, while AI tools are becoming more and more popular, their impact is frequently viewed as supplemental rather than transformative, AI is used by educators to improve administrative procedures and teaching methods, but it has little impact on the fundamentals of research and education.

There are only 4 teachers (2.96%) fall into the Less Impact category, which contains scores ranging from 12 to 28. This suggests that a relatively small percentage of educators believe AI will significantly improve their research. This category may consist of people who don't know much about AI tools, don't have access to them, or operate in fields with little AI applications.

On the other end of the scale, 15 teachers (11.11% of respondents) fall into the Very Impactful category (45–60). These people probably see AI as revolutionary, greatly improving their research capabilities. AI may offer this group sophisticated features like automatic writing support, predictive modelling, and effective handling of big datasets, which could boost their research output and creativity.

The data shows a generally positive trend, with most professors reporting at least some degree of benefit from AI in their research activities. The comparatively low percentages in the Less Impact and Very Impactful categories, however, also point to differences in the teaching community's perceptions and uses of AI tools. Access to technology, knowledge of AI applications, and the particulars of their research areas could all have an impact on this. The results highlight the need for more educators to fully utilize AI's potential to improve research productivity, which calls for additional training, resources, and awareness. In contrast with the result, Perkins and Roe's (2024) found that although GenAI tools present fresh opportunities to boost research output and democratize intricate analytical procedures, their incorporation into scholarly practice poses important concerns about authorship, research integrity, and the evolving character of scholarly work. This emphasizes how important it is to use AI tools in research in an ethical and responsible manner.

Impact of Artificial Intelligence on Students' Learning Outcomes in Higher Education Institutions of Assam

Objective- 2: To measure and evaluate the impact of AI integration on learning outcomes of teachers in higher educational institutions of Assam

Research Question- 2: What is the perceived impact of AI integration on Students' Learning Outcomes in higher educational institutions of Assam?

Table- 2: Overall impact of Artificial Intelligence on the Students of Assam in the Higher Educational Stage in relation to their Learning Outcomes

Impactful Category	Less (11-25)	Moderate (26-40)	High (41-55)	Total
Respondents	3	296	42	**341**
Percentage	0.88%	86.80%	12.32%	**100%**

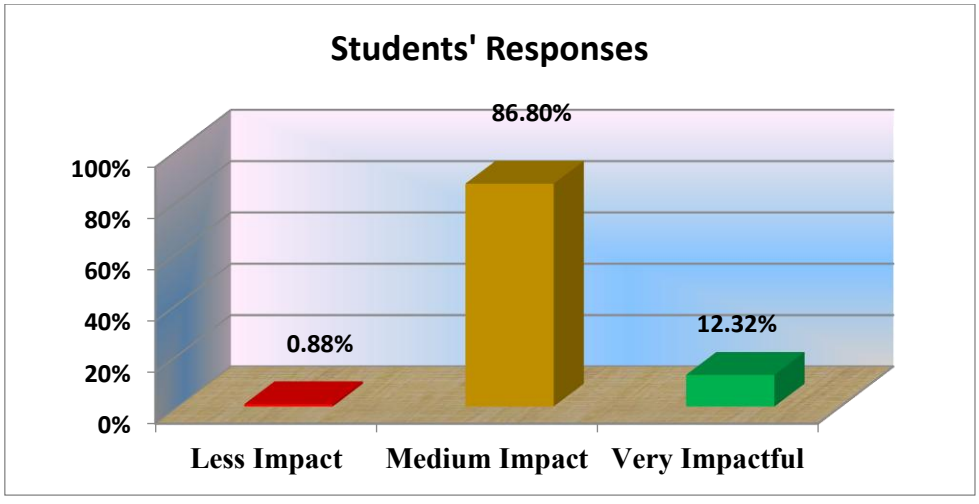


Figure- 2: Showing Overall impact of Artificial Intelligence on the Students of Assam in the Higher Educational Stage in relation to their Learning Outcomes

Results: The total effect of artificial intelligence (AI) on students of Higher education in Assam, particularly with regard to their learning outcomes, is shown in the table no. 2 and figure no. 2 The influence is divided into three categories i.e. less, moderate, and high.

In the Less Impactful category (11–25), just 3 respondents (0.88% of the total) said AI had little impact on their learning outcomes. It would appear from this that relatively few students believe AI would have minimal effect on their educational experience. Even if AI may not be revolutionary for everyone, it suggests that most students at least get some benefit from it, even if it isn't significant for some. This might also suggest that students' degrees of involvement with AI in education are still getting worked out. This aligns with findings from Das (2023), who noted that while AI has the potential to enhance education, its impact can vary among students, with some not experiencing significant benefits. The analysis of the impact of Artificial Intelligence (AI) on higher education students in Assam reveals varying perceptions of its influence on learning outcomes. A study by Sarma and Sarmah (2024) indicates that AI is playing a crucial role in enhancing the educational experience in Assam, suggesting that its integration is beneficial for students.

There are 296 responders in the Moderate Impact category (26–40), which accounts for 86.80% of the total. This suggests that most students believe AI has a moderate effect on their academic performance. Even though these students might not view AI as a revolutionary force in education, it is nevertheless regarded as a valuable tool that enhances their learning. This implies that AI enhances their educational experience without totally changing it, playing a major supporting role. This is consistent with research by Rahman (2022), who found that AI-based online proctored examinations were positively received by students in Assam, suggesting a moderate level of acceptance and perceived benefit. This is consistent with research by Rahman (2022), who found that AI-based online proctored examinations were positively received by students in Assam, suggesting a moderate level of acceptance and perceived benefit.

42 respondents (12.32%) in the High Impact category (41–55) said AI had a significant beneficial impact on their learning outcomes. This implies that even while fewer students believe AI has a big influence, their experiences demonstrate how helpful AI may be in raising educational outcomes and standards. The fact that these students have benefited from AI tools or applications that have significantly improved their learning suggests that AI's potential can be transformative for students. This finding is supported by Gupta and Bhattacharjee (2023), who observed that a subset of students in Assam view AI as a transformative tool that substantially enhances their learning and contributes to sustainable social empowerment.

Form the table and diagram it is found that, with 86.80% of respondents falling within the range of (26-40), most of the students in higher educational stage of Assam believe AI has a moderate impact on their learning outcomes. A little percentage claim either high (12.32%) or less (0.88%) influence. Although this trend suggests that AI is having an impact on education, most pupils are not yet transformed by it. According to this, artificial intelligence's place in education is still developing, and as technology develops and is more thoroughly incorporated into classrooms, it may have a bigger influence on students' educational experiences and eventually yield bigger advantages.

Impact of Artificial Intelligence on Administrative Efficiency in Higher Education Institutions of Assam

Objective- 3: To measure and evaluate the impact of AI integration on administrative efficiency of administrators in higher educational institutions of Assam

Research Question- 3: What is the perceived impact of AI integration on administrative efficiency of administrators in higher educational institutions of Assam?

Table- 3: Overall impact of Artificial Intelligence on the Administrators of Higher Educational Institution of Assam in relation to their Administrative Efficiency

Impactful Category	Less (10-23)	Moderate (24-36)	High (37-50)	Total
Respondents	3	24	4	**31**
Percentage	9.68%	77.42%	12.90%	**100%**

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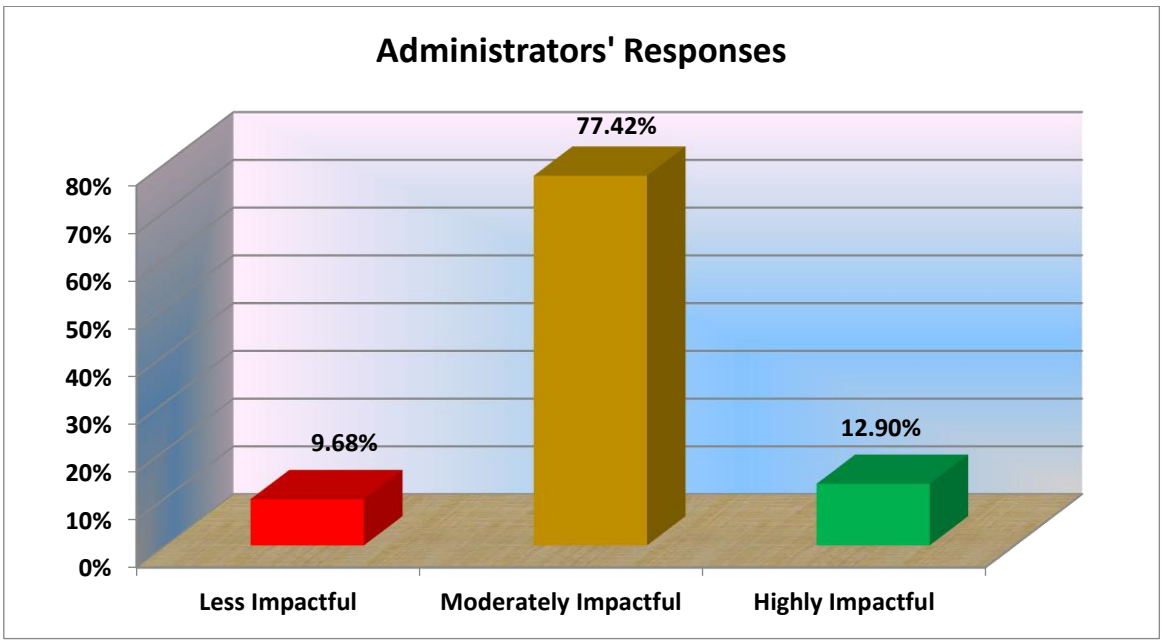


Diagram-3: Showing Overall impact of Artificial Intelligence on the Administrators of Higher Educational Institution of Assam in relation to their Administrative Efficiency

Results: The table no. 3 and Diagram no. 3 that the overall influence of Artificial Intelligence (AI) on administrators of higher education institutions in Assam, particularly in terms of administrative efficiency. The respondents' perceived influence is divided into three categories: "less," "moderate," and "high." Among the total responses, (9.68%) fall into the "Less" impactful category, showing that a tiny percentage believe AI has a minor impact on their administrative efficiency, with scores ranging from 10 to 23. It indicates that 9.68% administrators of higher educational institution of Assam admitted that Artificial Intelligence has less impact of their professional life.

On the other hand, it is also found that a sizable proportion of respondents (almost 77.42%) believe that Artificial Intelligence has a notable, but not overwhelming, impact on their administrative efficiency. These respondents are in the "Moderate" category, which corresponds to scores between 24 and 36. This shows that, while AI is regarded as positive, its impact is not viewed as revolutionary or significantly altering the administrative process by most administrators. Instead, AI is most likely being used to speed or support specific tasks (e.g., data processing, scheduling, decision-making assistance), but it does not yet appear to fully replace administrative methods or lead to highly significant changes.

Although a few of respondents (12.90%) believe AI will have a significant, transformative impact on their administrative efficiency. These respondents, who scored between 37 and 50, believe that AI tools or technologies have made major advances in how they manage administrative duties, decision-making, and overall workflow. This high-impact group is likely to see AI as a strong instrument that has revolutionized certain elements of their work, maybe by automating routine chores, boosting decision accuracy, streamlining processes, or allowing for more effective resource utilization. The fact that such a small percentage falls into this group suggests that, while AI's impact can be substantial for some, it is not generally felt in the same way. This could indicate variables such as better familiarity or more advanced AI tools available to this group, potentially coupled with a higher level of comfort and skill in using AI for administrative objectives. The findings align with broader research on AI's role in education. For instance, a study focusing on higher education in Guwahati, Northeast India, found that AI is revolutionizing university employment, impacting both administrative and academic domains (Borah et al., 2024). Similarly, in Assam, the education department has introduced AI-based educational applications to enhance communication between students, parents, teachers, and educational institutions (Sarma & Sarmah, 2024). These AI-driven tools are streamlining processes such as lesson planning, thereby improving efficiency in the education sector (Assam CM highlights AI's role in education, 2023).

DISCUSSION OF THE RESULTS

The findings of the study reveal that the perceived impact of Artificial Intelligence (AI) is predominantly moderate among teachers, students, and administrators in higher education institutions of Assam. Specifically, 85.93% of teachers reported a moderate perceived impact of AI on their research productivity, while 11.11% reported a high impact and 2.96% reported a low impact. Similarly, 86.80% of students reported a moderate perceived impact of AI on their learning outcomes, whereas 12.32% reported a high impact and 0.88% reported a low impact. Among administrators, 77.42% reported a moderate perceived impact of AI on administrative efficiency, while 12.90% reported a high impact and 9.68% reported a low impact. These findings indicate that AI has a moderately perceived influence on research productivity, learning outcomes, and administrative efficiency across the three respondent groups. However, the findings represent the respondents' perceptions of AI's impact and should not be interpreted as conclusive evidence that AI alone has directly caused improvements in these areas. The results suggest that although AI is being recognised as a useful tool in higher education, its potential benefits may require further institutional support, effective integration, and appropriate digital competencies to be fully realised.

RECOMMENDATIONS

Based on the results, the study suggests that higher education institutions of Assam should regularly conduct training programs, workshops, and orientation sessions to increase teachers', students', and administrators' understanding of and proficiency with AI. While students should be instructed to use AI tools to enhance their comprehension, problem-solving, and autonomous learning, teachers should be encouraged to use them to support research efforts. To make normal office tasks, data administration, paperwork, and institutional planning easier, administrators should look into AI solutions. Additionally, especially in places with limited resources, institutions should enhance digital infrastructure, internet connectivity, and access to reasonably priced AI tools. To guaranty the moral and responsible application of AI, clear institutional regulations should be created, giving due consideration to academic integrity, data protection, openness, and human oversight. Additionally, it is important to monitor and evaluate AI integration on a frequent basis. In order to exchange resources and best practices, cooperation between colleges, universities, and research institutes should be promoted. Lastly, more studies should be carried out to investigate the long-term effects of AI on administrative effectiveness, student learning results, and research output in various kinds of higher education institutions.

CONCLUSION

The current study looked at how artificial intelligence (AI) was considered to affect administrators' effectiveness, students' learning outcomes, and teachers' research productivity in the higher education institutions of Assam. The results show that all three categories' perceptions of AI's impact are largely moderate, suggesting that while its full potential has not yet been realized, AI is acknowledged as a helpful supporting resource.

The findings imply that AI can promote students' learning, help teachers with research projects, and enhance administrative procedures. However, sufficient digital infrastructure, hands-on training, institutional support, and unambiguous ethical rules are necessary for its successful integration. Therefore, while upholding academic integrity, critical thinking, and human judgment, higher education institutions should concentrate on encouraging the appropriate and meaningful use of AI.

The study provides insights into AI adoption in the higher education sector of Assam and may help policymakers and institutional authorities develop appropriate strategies for its effective integration. However, as the study is based on respondents' perceptions, the findings do not establish a direct causal relationship between AI adoption and improvements in performance. Further research using objective indicators and longitudinal approaches may provide a deeper understanding of its impact. Overall, AI has considerable potential to contribute to a more efficient, inclusive, and technology-supported higher education system in Assam.

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