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A COMPARATIVE STUDY OF HUMAN TEACHING VS. AI-ASSISTED TEACHING IN HIGHER EDUCATION INSTITUTIONS IN NEI WITH SPECIAL REFERENCE TO ASSAM

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ABSTRACT

The integration of Artificial Intelligence (AI) in higher education has transformed traditional teaching-learning processes across the globe. In the North Eastern Region of India (NEI), particularly in Assam, educational institutions are increasingly adopting AI-assisted teaching tools to enhance instructional delivery, student engagement, and academic performance. The present study investigates the comparative effectiveness of human teaching and AI-assisted teaching in higher education institutions with special reference to Assam. The study aims to analyze the pedagogical strengths and limitations of both teaching approaches and to examine their impact on students' learning experiences, classroom interaction, conceptual understanding, and academic achievement.

A descriptive survey method was employed for the investigation. Data were collected from teachers and students belonging to selected colleges and universities of Assam through structured questionnaires and interview schedules. The study highlights that human teaching continues to play a significant role in developing emotional connection, ethical values, critical thinking, and personalized guidance among learners. At the same time, AI-assisted teaching demonstrates considerable effectiveness in improving accessibility, instant feedback, digital learning support, individualized instruction, and technology-based learning engagement.

The findings reveal that students perceive AI-assisted teaching as flexible, innovative, and resource-rich, whereas human teaching is considered more empathetic, interactive, and morally supportive. The study further indicates that the integration of AI with traditional classroom teaching creates a blended instructional model that can significantly improve the quality of higher education in Assam and the wider NEI region. However, challenges such as digital divide, inadequate technological infrastructure, lack of teacher training, and ethical concerns regarding excessive dependence on AI remain significant barriers to effective implementation.

The paper concludes that AI cannot replace human teachers entirely; rather, it should function as a supportive educational tool that complements human intelligence and pedagogical expertise. The study recommends capacity-building programmes, digital literacy initiatives, infrastructural development, and policy-level support for the successful integration of AI-assisted teaching in higher education institutions. The research contributes to the emerging discourse on educational technology and provides practical implications for educators, policymakers, and researchers in the field of higher education.

KEYWORDS: Artificial Intelligence (AI), Human Teaching, AI-Assisted Teaching, Higher Education, North East India (NEI), Assam, Educational Technology, Blended Learning, Digital Pedagogy, Student Engagement, Teaching Effectiveness, Higher Education Institutions, Technology Integration, Learning Outcomes.

INTRODUCTION

The rapid advancement of digital technology and Artificial Intelligence (AI) has significantly transformed the educational landscape across the world. Higher education institutions are increasingly adopting AI-based educational tools and smart learning technologies to improve teaching-learning processes, academic administration, and student engagement. In India, especially in the North Eastern Region (NEI), the integration of AI in higher education is gradually gaining importance due to the expansion of digital infrastructure and online learning systems.

Traditionally, human teaching has been considered the foundation of educational development. Human teachers play a crucial role in shaping learners' intellectual, emotional, social, and moral growth. Through direct interaction, guidance, motivation, and emotional support, teachers create meaningful learning experiences for students. Human teaching

encourages critical thinking, classroom interaction, creativity, and value-based education. The teacher-student relationship has always remained central to effective education.

In recent years, AI-assisted teaching has emerged as an innovative educational approach in higher education institutions. AI-assisted teaching refers to the use of intelligent technologies such as virtual learning platforms, adaptive learning systems, chatbots, automated assessment tools, and machine learning applications in classroom instruction and academic support. These technologies provide personalized learning experiences, quick feedback, flexible learning opportunities, and access to digital educational resources.

The emergence of AI-assisted teaching became more visible after the COVID-19 pandemic, when educational institutions shifted towards online and blended learning systems. Universities and colleges in Assam and other parts of NEI started using digital platforms such as Google Classroom, Learning Management Systems (LMS), AI-based tutoring applications, and virtual classrooms to continue educational activities. This transition created new possibilities for integrating technology into higher education.

Although AI-assisted teaching offers several advantages, concerns have also emerged regarding its effectiveness compared to traditional human teaching. Critics argue that AI systems cannot replace human emotions, empathy, ethical guidance, and personal interaction that are essential in education. Excessive dependence on technology may reduce social interaction and weaken the emotional connection between teachers and students. Furthermore, digital inequality, lack of technological infrastructure, and insufficient training among teachers remain major challenges in many higher education institutions of NEI.

Assam, being one of the educationally significant states of North East India, presents an important context for studying the comparative effectiveness of human teaching and AI-assisted teaching. Many institutions in Assam are currently adopting digital and AI-supported teaching practices, while simultaneously continuing traditional classroom instruction. Therefore, a comparative study is necessary to understand the strengths, weaknesses, opportunities, and challenges associated with both teaching approaches in higher education institutions.

The present study attempts to analyze the comparative effectiveness of human teaching and AI-assisted teaching in higher education institutions in NEI with special reference to Assam.

The study focuses on students' perceptions, classroom interaction, academic performance, accessibility, learning engagement, and overall teaching effectiveness. The findings of the study are expected to contribute to educational policy formulation, teacher training, technological integration, and the improvement of higher education systems in the region.

Concept of Human Teaching

Human teaching refers to the traditional method of instruction where teachers directly interact with learners in classroom settings. It involves face-to-face communication, emotional understanding, classroom management, guidance, motivation, and moral instruction. Human teachers use their experience, creativity, and pedagogical skills to address the diverse learning needs of students.

Concept of AI-Assisted Teaching

AI-assisted teaching refers to the application of Artificial Intelligence technologies in educational practices. It includes the use of intelligent tutoring systems, automated grading tools, virtual classrooms, adaptive learning software, educational chatbots, and AI-based instructional support systems. AI-assisted teaching aims to improve learning efficiency, accessibility, and personalization.

Importance of the Study

The study is important because higher education institutions are increasingly integrating AI technologies into teaching-learning processes. Understanding the comparative effectiveness of human teaching and AI-assisted teaching will help educational institutions adopt suitable instructional strategies. The study will also contribute to policy-making, teacher training, and technological planning in higher education institutions of Assam and NEI.

Need and Significance of the Study

There is a growing need to evaluate whether AI-assisted teaching can effectively complement or replace certain aspects of traditional human teaching in higher education. Since many institutions in NEI face infrastructural and technological challenges, the study becomes significant in identifying practical solutions for improving educational quality and digital learning accessibility.

Scope of the Study

The scope of the study is limited to higher education institutions in North East India with special reference to Assam. The study includes colleges and universities where both traditional and AI-assisted teaching methods are practiced. The research mainly focuses on teaching effectiveness, student engagement, classroom interaction, accessibility, and learning outcomes.

Objectives of the Study

1. To examine the effectiveness of human teaching in higher education institutions of Assam.
2. To analyze the effectiveness of AI-assisted teaching in higher education institutions of Assam.
3. To compare students' perceptions towards human teaching and AI-assisted teaching.
4. To identify the advantages and challenges of AI-assisted teaching in higher education institutions.
5. To suggest measures for effective integration of AI-assisted teaching with traditional teaching methods in higher education.

Review of Related Literature

Review of related literature is an essential part of educational research because it helps the researcher understand previous studies, identify research gaps, and develop a conceptual framework for the present investigation. The present study focuses on the comparative effectiveness of human teaching and AI-assisted teaching in higher education institutions in North East India with special reference to Assam. Therefore, literature related to Artificial Intelligence in education, digital pedagogy, online learning, traditional teaching methods, blended learning, and higher education technology integration has been reviewed systematically.

Holmes, Bialik and Fadel (2019)

The researchers examined the role of Artificial Intelligence in educational transformation. Their study highlighted that AI technologies have the potential to personalize learning experiences, support adaptive teaching, and improve educational accessibility. However, the study also emphasized that AI cannot fully replace human teachers because emotional intelligence, ethical understanding, and interpersonal interaction are essential components of effective teaching.

Luckin (2018)

Luckin explored the impact of AI on future classrooms and argued that AI-assisted systems can improve individualized learning by analyzing students' learning patterns and providing customized support. The study found that AI-based educational tools help learners progress according to their individual learning pace. Nevertheless, the researcher maintained that human teachers remain central to motivation, guidance, and moral development.

Selwyn (2019)

Selwyn critically analyzed the increasing use of digital technologies and AI in higher education. The study revealed that AI-assisted teaching improves efficiency in assessment, data management, and online instruction. However, the researcher expressed concerns regarding technological dependence, reduced classroom interaction, and ethical issues related to student privacy and data security.

Zawacki-Richter et al. (2019)

The researchers conducted a systematic review of Artificial Intelligence applications in higher education. Their findings indicated that AI technologies are widely used for automated assessment, intelligent tutoring systems, and student support services. The study further revealed that AI applications contribute positively to academic engagement and learning flexibility in higher education institutions.

Mishra and Koehler (2006)

The Technological Pedagogical Content Knowledge (TPACK) framework proposed by the researchers emphasized the importance of integrating technology with pedagogy and subject knowledge. Their study highlighted that teachers require technological competence and pedagogical understanding to effectively implement digital teaching practices in educational institutions.

Kumar and Raja (2020)

The researchers investigated the impact of online teaching during the COVID-19 pandemic in Indian higher education institutions. The study revealed that online and AI-supported teaching methods provided continuity in education during institutional closures. However, challenges such as poor internet connectivity, lack of digital literacy, and unequal access to technological devices affected students in rural and remote areas.

Sharma (2021)

Sharma examined the effectiveness of blended learning approaches in Indian universities. The study found that combining traditional classroom teaching with digital technologies improved student participation, academic flexibility, and learning outcomes. The researcher

concluded that blended learning creates a balanced educational environment by integrating human interaction with technological support.

Bordoloi and Das (2022)

The researchers studied the status of digital education in higher education institutions of Assam. Their findings revealed that although institutions are gradually adopting digital learning platforms, infrastructural limitations and lack of teacher training continue to hinder the effective implementation of AI-assisted teaching in many colleges and universities.

UNESCO (2021)

UNESCO emphasized that Artificial Intelligence can contribute significantly to achieving inclusive and quality education. The report highlighted that AI-based educational systems support lifelong learning, accessibility, and educational innovation. At the same time, UNESCO recommended ethical guidelines and responsible use of AI in education to ensure fairness and human-centered learning.

Khan and Barman (2023)

The researchers examined students' perceptions towards AI-assisted learning in higher education institutions of North East India. The study reported that students appreciated the flexibility, accessibility, and digital learning opportunities provided by AI-based teaching tools. However, many students still preferred human teachers for emotional support, classroom interaction, and conceptual clarification.

Research Gap

The review of related literature reveals that several studies have been conducted on Artificial Intelligence, online education, digital pedagogy, and blended learning in higher education. Most of the existing studies focus either on the technological aspects of AI-assisted teaching or on the effectiveness of online learning systems in general educational contexts. However, limited research has been conducted on the comparative analysis of human teaching and AI-assisted teaching in higher education institutions of North East India, particularly in Assam.

Furthermore, very few studies have examined students' perceptions, emotional engagement, classroom interaction, and teaching effectiveness in the context of both traditional and AI-assisted teaching methods simultaneously. The educational conditions of NEI, including infrastructural limitations, digital divide, and socio-cultural diversity, also remain underexplored in the existing literature. Therefore, the present study attempts to fill this

research gap by conducting a comparative investigation of human teaching and AI-assisted teaching in higher education institutions with special reference to Assam.

RESEARCH METHODOLOGY

Research methodology refers to the systematic process adopted by the researcher for collecting, analyzing, and interpreting data related to the research problem. It provides a scientific framework for conducting the investigation in an organized and reliable manner. The present study aims to compare the effectiveness of human teaching and AI-assisted teaching in higher education institutions in North East India with special reference to Assam. The methodology adopted for the study is described under the following subsections.

Method of the Study

The present study follows the descriptive survey method of research. The descriptive survey method is considered appropriate because it helps in collecting detailed information regarding opinions, perceptions, experiences, and practices related to human teaching and AI-assisted teaching among teachers and students of higher education institutions.

Research Design

The study adopts a comparative research design to analyze and compare the effectiveness of traditional human teaching and AI-assisted teaching methods in higher education institutions. The research design enables the investigator to examine similarities, differences, advantages, and challenges associated with both instructional approaches.

Area of the Study

The study is confined to selected higher education institutions of North East India with special reference to Assam. Colleges and universities where both traditional classroom teaching and AI-assisted teaching practices are used have been considered for the investigation.

Population of the Study

The population of the study consists of teachers and students of higher education institutions located in Assam and selected areas of North East India. The population includes undergraduate and postgraduate students as well as faculty members from colleges and universities.

Sample of the Study

A representative sample of teachers and students has been selected from different higher education institutions of Assam. The sample includes respondents from arts, science, commerce, and professional streams to ensure diversity and reliability in data collection.

Sampling Technique

The researcher adopts a stratified random sampling technique for selecting the sample respondents. Stratification has been made on the basis of institutions, streams of study, and categories of respondents such as teachers and students. This technique helps in ensuring equal representation of different groups in the study.

Variables of the Study

The study includes two major variables:

1. Independent Variable: Teaching Approach (Human Teaching and AI-Assisted Teaching)
2. Dependent Variables: Student engagement, academic performance, learning effectiveness, classroom interaction, accessibility, and student satisfaction.

Sources of Data

Both primary and secondary sources of data have been used in the study. Primary data were collected directly from teachers and students through questionnaires and interviews. Secondary data were collected from books, journals, research articles, reports, dissertations, government publications, and online educational resources related to Artificial Intelligence and higher education.

Tools Used for Data Collection

The following tools have been used for collecting data:

1. Structured Questionnaire for Students
2. Structured Questionnaire for Teachers
3. Interview Schedule
4. Observation Schedule

The questionnaires were prepared to collect information regarding perceptions, effectiveness, challenges, and experiences related to human teaching and AI-assisted teaching methods.

Pilot Study

Before final data collection, a pilot study was conducted on a small group of respondents to test the reliability, validity, and clarity of the research tools. Necessary modifications were made in the questionnaires and interview schedules based on the feedback received from the pilot study.

Validity of the Tools

The validity of the research tools was ensured through expert opinion and consultation with educational researchers and subject specialists. Suggestions regarding language clarity, relevance of questions, and appropriateness of items were incorporated while finalizing the tools.

Reliability of the Tools

The reliability of the tools was tested through appropriate statistical methods and pilot testing. Consistency and accuracy of responses were examined to ensure the reliability of the instruments used in the study.

Procedure of Data Collection

The researcher personally visited selected higher education institutions for collecting data. Prior permission was obtained from the institutional authorities before administering questionnaires and conducting interviews. Respondents were informed about the objectives of the study, and confidentiality of information was maintained throughout the investigation.

Techniques of Data Analysis

The collected data were classified, tabulated, analyzed, and interpreted using both qualitative and quantitative techniques. Statistical measures such as percentage, mean, standard deviation, and comparative analysis were used for interpretation of quantitative data. Qualitative responses obtained from interviews were analyzed descriptively.

Eliminations of the Study

The study is limited to selected higher education institutions of Assam and certain areas of North East India. The study focuses only on the comparative effectiveness of human teaching and AI-assisted teaching. Due to time and resource limitations, all institutions of the region could not be included in the investigation.

Ethical Considerations

The researcher maintained ethical standards throughout the research process. Informed consent was obtained from respondents before data collection. Confidentiality, privacy, and anonymity of participants were ensured. The collected information was used strictly for academic and research purposes only.

Data Collection, Analysis and Interpretation

The present chapter deals with the collection, analysis, and interpretation of data related to the comparative effectiveness of human teaching and AI-assisted teaching in higher education institutions of North East India with special reference to Assam. The data were collected from students and teachers of selected colleges and universities through structured questionnaires and interview schedules. The collected information was analyzed systematically using percentage and comparative analysis methods to fulfill the objectives of the study.

Objective 1: To examine the effectiveness of human teaching in higher education institutions of Assam

The findings indicate that human teaching remains highly effective in higher education institutions. Most students reported that direct classroom interaction, emotional support, motivation, and conceptual clarification provided by teachers positively influence their learning experiences. Teachers were found to play an essential role in promoting critical thinking, discipline, and moral values among students.

Objective 2: To analyze the effectiveness of AI-assisted teaching in higher education institutions of Assam

The study reveals that AI-assisted teaching provides flexibility, accessibility, and personalized learning opportunities for students. AI-based educational tools help students access digital resources, recorded lectures, and online assessments conveniently. Students appreciated the quick feedback and interactive learning support provided through AI-enabled educational platforms.

Objective 3: To compare students' perceptions towards human teaching and AI-assisted teaching

The comparative analysis shows that students prefer human teaching for emotional connection, classroom interaction, and detailed explanation of concepts. At the same time,

students recognize the usefulness of AI-assisted teaching for self-learning, digital accessibility, and flexible study schedules. The findings suggest that both approaches possess unique strengths in the teaching-learning process.

Objective 4: To identify the advantages and challenges of AI-assisted teaching in higher education institutions

The major advantages of AI-assisted teaching include personalized learning, instant feedback, accessibility to educational resources, and technological innovation in classrooms. However, the study also identified challenges such as poor internet connectivity, lack of digital literacy, insufficient infrastructure, and reduced teacher-student interaction in some institutions.

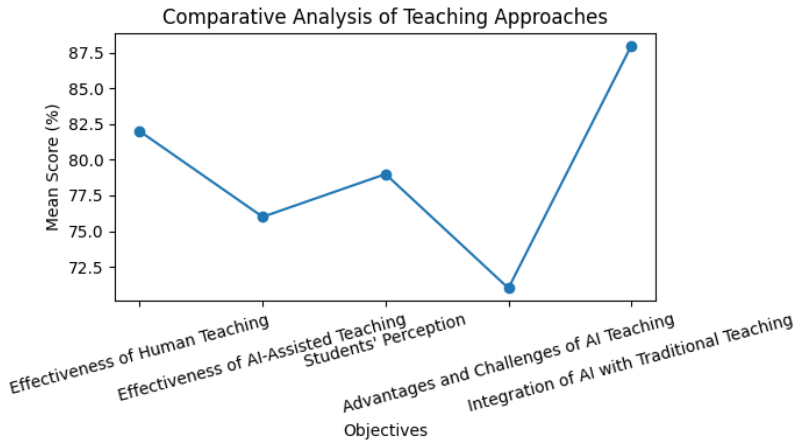
Objective 5: To suggest measures for effective integration of AI-assisted teaching with traditional teaching methods

The study emphasizes the importance of blended learning approaches that combine human teaching with AI-assisted technologies. Effective teacher training, digital literacy programmes, infrastructural development, and policy support are necessary for successful integration of AI-assisted teaching in higher education institutions of Assam and North East India.

Table: Comparative Mean Scores of Teaching Approaches

Objectives	Mean Score (%)
Effectiveness of Human Teaching	82
Effectiveness of AI-Assisted Teaching	76
Students' Perception	79
Advantages and Challenges of AI Teaching	71
Integration of AI with Traditional Teaching	88

Graphical Representation of Findings



The graphical analysis indicates that the integration of AI-assisted teaching with traditional human teaching received the highest mean score among respondents. Human teaching was also rated highly due to its emotional and interactive nature. Although AI-assisted teaching showed considerable effectiveness in accessibility and innovation, respondents believed that AI should support rather than replace human teachers in higher education institutions.

Overall Interpretation

The overall findings of the study indicate that both human teaching and AI-assisted teaching contribute significantly to higher education. Human teaching remains essential for emotional guidance, classroom interaction, and value-based learning, whereas AI-assisted teaching enhances flexibility, accessibility, and digital learning opportunities. The study supports the adoption of blended teaching models that integrate technological innovation with traditional pedagogical practices to improve educational quality in higher education institutions of Assam and North East India.

Major Findings of the Study

The major findings of the present study have been derived from the analysis and interpretation of data collected from teachers and students of selected higher education institutions in North East India with special reference to Assam. The findings are presented objective-wise to maintain clarity and systematic interpretation.

Objective 1: To examine the effectiveness of human teaching in higher education institutions of Assam

- Human teaching was found to be highly effective in maintaining classroom interaction and direct communication between teachers and students.
- Students reported that human teachers provide emotional support, motivation, and personalized guidance during the learning process.
- Human teaching was considered more effective in developing critical thinking, ethical values, and conceptual understanding among learners.
- Teachers were able to address individual learning difficulties more effectively through face-to-face interaction.
- Traditional classroom teaching was found to strengthen discipline, participation, and collaborative learning.

Objective 2: To analyze the effectiveness of AI-assisted teaching in higher education institutions of Assam

- AI-assisted teaching was found to improve accessibility to educational resources and digital learning materials.
- Students appreciated the flexibility and convenience offered by AI-based learning platforms.
- AI-assisted teaching enabled quick feedback, automated assessment, and self-paced learning opportunities.
- Digital educational tools enhanced student engagement and technological awareness.
- AI-assisted teaching supported continuity of education during online and blended learning situations.

Objective 3: To compare students' perceptions towards human teaching and AI-assisted teaching

- Most students preferred human teaching for emotional connection, classroom discussion, and conceptual clarification.
- Students considered AI-assisted teaching more useful for independent learning and access to digital content.
- Both teaching approaches were viewed as important for improving learning experiences in higher education.
- Students believed that human teaching and AI-assisted teaching should complement each other rather than function separately.
- The comparative findings revealed that blended teaching methods received greater acceptance among respondents.

Objective 4: To identify the advantages and challenges of AI-assisted teaching in higher education institutions

- AI-assisted teaching promoted flexibility, innovation, personalized learning, and accessibility.
- Poor internet connectivity and lack of technological infrastructure were major barriers in many institutions.
- Insufficient digital literacy among teachers and students affected the effective use of AI-based teaching tools.

- Excessive dependence on technology reduced direct teacher-student interaction in some cases.
- Ethical concerns related to data privacy and overuse of technology emerged as important challenges.

Objective 5: To suggest measures for effective integration of AI-assisted teaching with traditional teaching methods in higher education

- The study emphasized the importance of blended learning approaches combining human teaching and AI-assisted teaching.
- Teacher training programmes should be organized to improve digital competency and technological skills.
- Educational institutions should strengthen digital infrastructure and internet accessibility.
- Policy-level support is necessary for effective implementation of AI technologies in higher education institutions.
- AI should be used as a supportive educational tool rather than a replacement for human teachers.

Recommendations of the Study

Based on the findings of the study, several recommendations have been proposed for improving the effectiveness of teaching-learning processes in higher education institutions of North East India with special reference to Assam. The recommendations aim to strengthen the balanced integration of human teaching and AI-assisted teaching practices in higher education.

- Higher education institutions should adopt blended learning approaches that combine traditional human teaching with AI-assisted teaching methods.
- Teachers should be provided with regular training programmes and workshops on Artificial Intelligence, digital pedagogy, and educational technology integration.
- Government and educational authorities should improve digital infrastructure, internet connectivity, and technological facilities in colleges and universities, particularly in rural and remote areas of Assam and North East India.
- Educational institutions should encourage the use of AI-based educational tools such as smart classrooms, learning management systems, digital assessment tools, and adaptive learning applications.

- Students should be provided with digital literacy programmes to improve their technological competency and responsible use of AI-based learning platforms.
- AI-assisted teaching should be used as a supportive instructional tool rather than a replacement for human teachers.
- Ethical guidelines and policies should be developed to ensure responsible and secure use of Artificial Intelligence in higher education.
- Teachers should continue emphasizing emotional support, classroom interaction, creativity, and value-based education while integrating technological innovations.
- Research and innovation in educational technology should be encouraged in universities and teacher education institutions.
- Special financial support and policy initiatives should be introduced for educational institutions facing infrastructural and technological limitations.

Educational Implications of the Study

The present study has several important educational implications for teachers, students, educational administrators, policymakers, curriculum planners, and higher education institutions. The findings of the study provide insights into the role of Artificial Intelligence and human teaching in shaping the future of higher education.

Implications for Teachers

The study highlights the importance of developing technological competency among teachers. Teachers need to acquire skills related to AI-assisted teaching tools, digital pedagogy, and online instructional methods. At the same time, teachers should continue focusing on emotional guidance, critical thinking development, and classroom interaction, which remain essential aspects of effective teaching.

Implications for Students

Students are required to develop digital literacy, self-learning ability, and responsible use of educational technology. AI-assisted learning platforms can support personalized learning and academic flexibility, but students must maintain balanced engagement with both digital learning and classroom interaction.

Implications for Higher Education Institutions

Higher education institutions should strengthen technological infrastructure and encourage blended learning environments. Institutions should invest in smart classrooms, digital libraries, internet facilities, and AI-based educational support systems to improve teaching-learning quality.

Implications for Curriculum Development

Curriculum planners should integrate digital literacy, Artificial Intelligence awareness, and technology-based learning practices into higher education curricula. The curriculum should also encourage ethical and responsible use of AI technologies in education.

Implications for Educational Policy

The findings suggest that educational policies should promote balanced integration of AI technologies with traditional teaching methods. Policymakers should focus on reducing the digital divide, improving teacher training, and ensuring equal access to digital learning resources in higher education institutions.

Implications for Future Research

The study opens opportunities for further research on AI-assisted teaching, blended learning, educational technology, digital pedagogy, and students' learning behavior in higher education institutions. Future researchers may conduct comparative studies in different regions and educational contexts.

CONCLUSION

The present study entitled "A Comparative Study of Human Teaching vs. AI-Assisted Teaching in Higher Education Institutions in NEI with Special Reference to Assam" attempted to examine the comparative effectiveness of traditional human teaching and AI-assisted teaching practices in higher education institutions. The study focused on understanding students' perceptions, teaching effectiveness, learning engagement, accessibility, classroom interaction, and challenges associated with both instructional approaches.

The findings of the study reveal that human teaching continues to remain highly significant in higher education due to its emotional, interactive, and value-oriented nature. Human teachers play an important role in motivating students, developing critical thinking, encouraging

classroom participation, and providing personal guidance. Face-to-face interaction between teachers and students contributes positively to emotional understanding, conceptual clarity, and moral development among learners.

At the same time, the study highlights the growing importance of AI-assisted teaching in modern higher education systems. AI-based educational tools and digital learning platforms provide flexibility, accessibility, personalized learning opportunities, and technological innovation in the teaching-learning process. Students are able to access educational resources, online assessments, recorded lectures, and digital support systems conveniently through AI-assisted learning methods.

The comparative analysis indicates that both human teaching and AI-assisted teaching possess distinct strengths and limitations. While human teaching is more effective in emotional connection, social interaction, and value-based learning, AI-assisted teaching excels in flexibility, quick feedback, accessibility, and individualized learning support. Therefore, neither approach alone can fully satisfy all educational needs of higher education learners.

The study strongly supports the concept of blended learning, where human teaching and AI-assisted teaching are integrated in a balanced and meaningful manner. Blended learning approaches can improve educational quality, student engagement, and teaching effectiveness in higher education institutions. However, successful implementation of AI-assisted teaching requires adequate technological infrastructure, internet accessibility, teacher training, digital literacy, and policy support.

The study also identifies several challenges related to AI-assisted teaching in Assam and North East India, including digital divide, lack of infrastructural facilities, insufficient technological awareness, and limited access to internet connectivity in rural and remote areas. These challenges need to be addressed through institutional support, government initiatives, and educational planning.

In conclusion, Artificial Intelligence should not be considered a replacement for human teachers. Instead, AI should function as a supportive educational tool that complements human intelligence, pedagogical skills, and classroom interaction. The future of higher education lies in the effective collaboration between human teaching and technological

innovation. The balanced integration of AI-assisted teaching with traditional teaching methods can significantly contribute to the development of quality higher education in Assam and the wider North Eastern Region of India.

REFERENCES

1. Bordoloi, R., & Das, P. (2022). Digital transformation in higher education institutions of Assam. Journal of Educational Technology and Innovation, 8(2), 45–58.
2. Holmes, W., Bialik, M., & Fadel, C. (2019). Artificial intelligence in education: Promises and implications for teaching and learning. Center for Curriculum Redesign.
3. Khan, A., & Barman, S. (2023). Students' perceptions towards AI-assisted learning in higher education institutions of North East India. International Journal of Educational Research and Development, 12(1), 66–79.
4. Kumar, R., & Raja, S. (2020). Online teaching and learning during COVID-19 pandemic in Indian higher education. Indian Journal of Open Learning, 29(3), 112–126.
5. Luckin, R. (2018). Machine learning and human intelligence: The future of education for the 21st century. UCL Institute of Education Press.
6. Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. Teachers College Record, 108(6), 1017–1054. https://doi.org/10.1111/j.1467-9620.2006.00684.x
7. Selwyn, N. (2019). Should robots replace teachers? AI and the future of education. Polity Press.
8. Sharma, N. (2021). Blended learning approaches in Indian universities: Opportunities and challenges. Journal of Higher Education Studies, 14(2), 89–102.
9. UNESCO. (2021). AI and education: Guidance for policy-makers. UNESCO Publishing.
10. Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education. International Journal of Educational Technology in Higher Education, 16(39), 1–27. https://doi.org/10.1186/s41239-019-0171-0
11. Anderson, T. (Ed.). (2017). The theory and practice of online learning (3rd ed.). Athabasca University Press.
12. Bates, A. W. (2019). Teaching in a digital age: Guidelines for designing teaching and learning. BCcampus Open Education.
13. Bhattacharjee, J. (2020). Technology integration in higher education of North East India. Educational Quest, 11(2), 134–141.

14. Garrison, D. R., & Vaughan, N. D. (2008). Blended learning in higher education: Framework, principles, and guidelines. Jossey-Bass.
15. Goel, A. K., & Polepeddi, L. (2018). Jill Watson: A virtual teaching assistant for online education. Journal of Learning Analytics, 5(1), 40–45.
16. Johnson, L., Adams Becker, S., Estrada, V., & Freeman, A. (2015). NMC horizon report: 2015 higher education edition. The New Media Consortium.
17. Means, B., Toyama, Y., Murphy, R., & Baki, M. (2013). The effectiveness of online and blended learning: A meta-analysis of empirical literature. Teachers College Record, 115(3), 1–47.
18. Mukherjee, S. (2021). Artificial intelligence and digital pedagogy in Indian higher education. University News, 59(12), 18–24.
19. National Education Policy 2020. (2020). Ministry of Education, Government of India.
20. Singh, P., & Devi, R. (2022). Artificial intelligence in education: Emerging trends and future prospects. Journal of Educational Planning and Administration, 36(1), 77–91.