
HIGHER EDUCATION 5.0: THE ROLE OF ARTIFICIAL INTELLIGENCE IN DEVELOPING CRITICAL THINKING

***¹Dr. Anusha K. P., ²Kalpana. R.**

¹Assistant Professor BGS B-School, Bengaluru.

²Student, M.com BGSB-School, Bengaluru.

Article Received: 16 April 2026, Article Revised: 06 May 2026, Published on: 26 May 2026

***Corresponding Author: Dr. Anusha K. P.**

Assistant Professor BGS B-School, Bengaluru.

DOI: <https://doi-doi.org/101555/ijrpa.7643>

ABSTRACT

The rapid progress of digital technologies has drastically altered the structure and function of higher education institutions globally. In response to these advances, the idea of Higher Education 5.0 has emerged as a progressive educational framework that integrates the latest technological developments with human-centred teaching approaches. This way of thinking stresses the successful use of technology such as artificial intelligence and hybrid learning environments, while retaining educators' critical role in leading and enabling meaningful learning opportunities. Higher Education 5.0 strives to create a more flexible, inventive, and learner-centred academic environment by merging technological advancements with collaborative and student-focused teaching methodologies. Artificial intelligence-based educational tools and digital learning platforms have increasingly become part of modern educational systems. These technologies enable students to access a wide range of academic resources, explore diverse perspectives, and engage more actively in the learning process. The availability of intelligent learning systems also allows educators to design more interactive teaching strategies and provide timely academic support to students. As a result, the integration of artificial intelligence within higher education has the potential to enhance students' analytical abilities, promote independent learning, and encourage the development of critical thinking skills. Artificial intelligence-based educational tools and digital learning platforms have increasingly become part of modern educational systems. These technologies enable students to access a wide range of academic resources, explore diverse perspectives,

and engage more actively in the learning process. The availability of intelligent learning systems also allows educators to design more interactive teaching strategies and provide timely academic support to students. As a result, the integration of artificial intelligence within higher education has the potential to enhance students' analytical abilities, promote independent learning, and encourage the development of critical thinking skills.

KEYWORDS: Higher Education 5.0, Artificial Intelligence, Critical Thinking, Hybrid Learning.

INTRODUCTION

Many aspects of society, including education, have seen substantial changes as a result of the quick growth of digital technologies. In order to improve teaching and learning procedures, higher education institutions worldwide have embraced digital technologies more and more in recent years. Higher Education 5.0, which emphasises integrating modern technology like artificial intelligence, digital learning platforms, and hybrid learning systems while keeping a strong emphasis on human-centred teaching practices, has emerged as a result of this transformation. This educational approach aims to foster critical thinking, creativity, innovation, and teamwork among students in addition to increasing information access.

Higher Education 5.0 recognises the value of human contact in the learning process while emphasising the efficient use of technology in the classroom. One of the most significant technological advancements in contemporary education is artificial intelligence. Academic activities like content creation, writing support, tailored learning, and automated feedback are increasingly supported by AI-powered systems and intelligent educational solutions. With the help of these technologies, students can swiftly obtain academic knowledge, investigate many viewpoints on difficult subjects, and build autonomous study habits. Artificial intelligence can help teachers organise course materials, assess assignments, and track students' progress, all of which can increase the effectiveness of the teaching process. The use of hybrid learning strategies, which blend traditional classroom instruction with online learning techniques, is another crucial component of Higher Education 5.0. Through digital platforms, virtual learning environments, and online academic materials, hybrid learning enables students to access educational resources both within and outside of the classroom. This method gives students more learning flexibility, allowing them to study at their own speed while still gaining from teacher advice and class discussions. Additionally, hybrid learning

environments foster student cooperation and active engagement in the educational process. However, the idea of human-centred pedagogy continues to be a cornerstone of contemporary education. Teachers still play a crucial role in guiding students and promoting meaningful learning outcomes, even if technological advancements offer many potentials to enhance the educational process. Human-centred teaching places a strong emphasis on the value of emotional ties, moral accountability, and encouraging interactions between educators and learners. Teachers serve as mentors and facilitators who support students' growth in critical thinking, creativity, and the capacity to apply information in practical contexts.

Students' perceptions of how knowledge is learned and disseminated in higher education have been significantly impacted by the incorporation of digital learning resources and artificial intelligence. Today's students can study academic material outside of the boundaries of traditional textbooks and lectures because of the abundance of digital resources at their disposal. These tools facilitate self-directed learning, foster curiosity, and give students the chance to interact with a variety of educational resources. Concerns about excessive reliance on technology, a decline in in-person interactions, and potential effects on the moral and emotional aspects of teacher-student relationships have also been raised by the growing use of artificial intelligence in education.

As a result, understanding how artificial intelligence, hybrid learning strategies, and human-centred teaching methods affect students' educational experiences has become increasingly important in current higher education research. The goal of Higher Education 5.0 is to establish a well-balanced learning environment in which technological innovations enhance learning opportunities while maintaining the crucial role of human interaction and guidance in the teaching-learning process.

Objectives

1. To understand the concept and components of Higher Education 5.0 in the modern educational environment.
2. To evaluate whether AI-Based learning tools enhance students' critical thinking.
3. To examine the role of AI in supporting modern teaching and learning practices in higher education.

REVIEW OF LITERATURE

In recent years, researchers have focused a great deal of attention on the integration of digital technology and artificial intelligence in higher education. As Higher Education 5.0 has emerged, academics have been more interested in how technological advancements might improve educational opportunities while preserving human-centred teaching methods.

1. AI technologies can produce more individualized learning environments, according to Holmes, Bialik, and Fadel's (2019) analysis of the role of AI in education. Their research indicates that AI-powered systems can evaluate students' learning styles and offer customised feedback, helping pupils comprehend difficult ideas more successfully. The authors also emphasise how artificial intelligence might help teachers assess students' development and improve their teaching methods.
2. In the same manner, Luckin et al. (2016) investigated the use of AI in educational contexts and discovered that intelligent learning systems can help students improve their analytical and problem-solving abilities. According to their research, AI-based learning systems promote autonomous learning and active engagement, which may help students strengthen their critical thinking skills.
3. After conducting an extensive examination of AI applications in higher education, Zawacki-Richter et al. (2019) identified several important domains where AI technologies are being used, such as learning analytics, automated assessment, and intelligent tutoring systems. The study comes to the conclusion that AI can help institutions manage massive amounts of educational data while also increasing educational efficiency and improving learning results.
4. Additionally, Selwyn (2020) talked about the wider effects of digital technologies on higher education and stressed that effective human-centred pedagogical approaches should go hand in hand with technology integration. The author claims that while digital tools and artificial intelligence might increase educational accessibility and flexibility, teachers' presence is still crucial for leading students and creating meaningful learning opportunities.
5. With that, Kumar and Sharma (2022) looked at how digital learning platforms and artificial intelligence fit into contemporary teaching methods. According to their research, educators may create more engaging learning environments and motivate students to conduct independent research by using AI-supported instructional technologies. But the authors also stress how crucial it is to preserve productive teacher- student engagement while striking a balance between ethical issues and technical improvements.

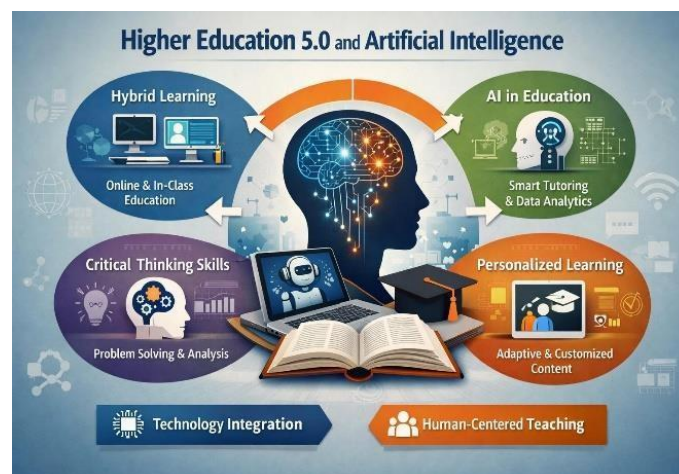
RESEARCH METHODOLOGY

The current study uses a descriptive research approach to investigate the idea of Higher Education 5.0 as well as the use of artificial intelligence in contemporary higher education teaching and learning methods. The goal of the study is to comprehend how artificial intelligence-based learning resources assist modern teaching methods and help students develop their critical thinking skills. The study is solely dependent on secondary data.

A variety of secondary sources, such as scholarly journals, research articles, books, conference papers, and trustworthy online educational reports about artificial intelligence in education, Higher Education 5.0, and digital learning technologies, have provided pertinent information for the study. These resources offer insightful information about how artificial intelligence is incorporated into higher education systems and how it affects the teaching-learning process.

To fully understand the key ideas and advancements related to Higher Education 5.0, the gathered data was thoroughly examined, arranged, and reviewed. Particular focus was placed on determining how educational tools based on artificial intelligence improve students' critical thinking skills and how these technologies help teachers create more adaptable and dynamic learning environments. The study aims to offer a thorough grasp of the possibilities and ramifications of incorporating artificial intelligence in higher education by using this analytical method.

Concept and Components of Higher Education 5.0



(This diagram represents the core components of Higher Education 5.0, where artificial intelligence, hybrid learning, and human-centered pedagogy work together to enhance student learning outcomes).

The ongoing development of digital technologies has led to major changes in higher education over the past few decades. Higher Education 5.0 is a forward-thinking educational framework that combines advanced technical systems with human-centred teaching methods. The goal of this model is to establish a learning environment that preserves the crucial function of teachers and human connection while utilising technology to support and improve the educational process. To prepare students for the demands of a fast-changing digital society, Higher Education 5.0 places a strong emphasis on developing students' creativity, critical thinking, teamwork, and problem-solving skills.

The use of artificial intelligence in education is a key feature of Higher Education 5.0. AI technologies allow students to quickly access academic information and explore a variety of sources of knowledge outside of traditional classroom materials. AI-supported learning systems can help students improve their research skills, analyse complex information, and develop independent learning habits. For educators, AI can help organise academic content, track students' progress, and provide more individualized learning experiences. Another critical aspect of Higher Education 5.0 is the implementation of hybrid learning environments, which blend traditional classroom instruction with digital learning platforms. By enabling students to participate in in-person class discussions and access instructional resources online, hybrid learning gives them more flexibility. With the help of teachers' direction and support, students can learn at their own pace and accessibility is improved.

Additionally, a key component of Higher Education 5.0 is still human-centred teaching. Even while technology has many benefits in terms of accessibility and efficiency, teachers still play a critical role in guiding students and creating meaningful learning opportunities. Teachers serve as mentors who help students develop critical thinking skills, participate in group projects, and use what they've learned in real-world contexts. By ensuring that technology enhances rather than replaces human connection, human-centred teaching also contributes to the preservation of the ethical and emotional aspects of education. Higher Education 5.0 promotes the growth of critical thinking, creativity, adaptability, digital literacy, and other vital abilities needed in the contemporary knowledge economy. This educational approach seeks to establish a more dynamic and student-centred learning environment by integrating technological advances with creative teaching techniques. Therefore, by training students to successfully handle the opportunities and challenges of the digital era, Higher Education 5.0 plays a crucial role in creating the future of education.

Artificial Intelligence and Students' Critical Thinking

Particularly in higher education, where digital technologies are progressively incorporated into teaching and learning procedures, artificial intelligence has grown to be a significant aspect of contemporary educational settings. Students can access a variety of academic knowledge, interactive resources, and intelligent assistance systems that can help them comprehend difficult topics thanks to AI-based learning technologies. With the use of these resources, students can better analyse data, gain a greater understanding of the subject matter, and investigate a variety of viewpoints on academic subjects. Because of this, artificial intelligence has the ability to significantly improve pupils' critical thinking skills.

One of the primary benefits of AI-based learning tools is their ability to provide immediate access to information and different sources of knowledge. Students can now explore a variety of explanations, examples, and learning resources available through digital platforms rather than being restricted to traditional textbooks or lectures in the classroom. Students are encouraged to assess and contrast various points of view, which is a crucial component of critical thinking, by being exposed to a variety of information. Automated feedback, intelligent tutoring systems, and adaptable learning platforms are just a few of the interactive learning opportunities provided by AI-supported educational solutions. These tools evaluate students' answers and offer tailored recommendations that assist students in spotting errors, honing their comprehension, and developing their problem-solving abilities. Instead of just passively absorbing knowledge, these features inspire students to actively interact with the learning content.

However, it is crucial to understand that the application of artificial intelligence in education has several obstacles. Students' capacity for independent thought may be diminished by an over-reliance on AI-based technologies if the technology is utilized without appropriate supervision. As a result, educators play an important role in ensuring that AI is utilized as an aid to learning rather than as a replacement for critical thinking. Overall, artificial intelligence-based learning technologies have the potential to improve students' critical thinking skills by offering access to a variety of knowledge resources, encouraging active engagement with learning materials, and promoting autonomous research. When paired with excellent teaching approaches, these tools can considerably help students acquire higher-order thinking skills in today's higher education environments.

Artificial Intelligence in Supporting Modern Teaching and Learning Practices in Higher Education

AI is becoming a crucial part of contemporary teaching methods, especially in universities that are adjusting to the digital revolution. The way teachers share information and how students interact with course materials have both been significantly changed by the adoption of AI technologies. Educational institutions may build more adaptable, interactive, and student-centred learning environments by integrating digital learning tools and intelligent systems.

The capacity of artificial intelligence to facilitate individualised learning experiences is one of its most significant contributions to education. By analysing students' learning styles, preferences, and performance levels, AI-powered educational systems enable teachers to create lesson plans that more effectively meet each student's unique learning needs. With this method, teachers can assist students in overcoming academic challenges and enhance their overall learning outcomes by offering focused guidance and support.

Additionally, artificial intelligence helps teachers enhance classroom management and educational effectiveness. Teachers can monitor student progress, analyse assignments, and give timely feedback using digital learning platforms and automated assessment tools. Teachers' administrative burden is reduced as a result, allowing them to concentrate more on mentoring and assisting pupils as they learn. AI technology also aids in the creation of collaborative and interactive learning environments.

Artificial intelligence-powered digital platforms enable students to take part in virtual academic activities, access multimedia learning resources, and participate in debates. Students are encouraged to actively participate and collaborate in such learning environments, which improves the teaching-learning process and the overall effectiveness. Furthermore, hybrid and technology-enhanced learning models-which mix traditional classroom instruction with digital learning resources-are supported by artificial intelligence. This strategy increases accessibility and flexibility in higher education by enabling students to access instructional materials at any time and from a variety of locations. Additionally, instructors can use these digital technologies to distribute learning materials, give lectures, and interact with students more effectively.

Even though artificial intelligence has many advantages for modern education, it is crucial to strike a balance between technology advancement and interpersonal communication. Teachers continue to play a crucial role in mentoring pupils, fostering critical thinking, and guaranteeing the moral use of technology in educational endeavours. Therefore, rather than taking the place of educators, artificial intelligence should be seen as a helpful tool that improves teaching methods.

Overall, the integration of artificial intelligence in higher education has contributed to the transformation of modern teaching and learning practices. By supporting personalized learning, improving instructional efficiency, and facilitating interactive learning environments, AI technologies play a significant role in shaping the future of higher education.

Opportunities and Challenges of Artificial Intelligence in Higher Education

Artificial intelligence has opened up various possibilities for increasing the quality and accessibility of higher education. One of the main benefits is that students may quickly access learning resources and investigate a variety of information sources outside of traditional textbooks due to AI technologies. Additionally, AI-based educational tools facilitate individualised learning, allowing students to study at their own speed and in accordance with their own learning requirements. Additionally, by supporting content distribution, automated exams, and prompt student response, artificial intelligence helps teachers handle academic tasks more effectively. These advancements help create more adaptable and dynamic learning environments at higher education institutions.

But despite these benefits, there are certain drawbacks to using artificial intelligence in the classroom. One of the main concerns is the potential for students to become overly dependent on technology, relying too much on AI tools rather than learning how to think critically on their own. The utilisation of modern digital tools may raise the possibility of duplication or information misuse, which presents another ethical and academic integrity concern. The emotional and interpersonal components of the learning process may also be impacted by the overuse of digital learning platforms, which may decrease direct face-to-face connections between instructors and students. As a result, it's critical that educational institutions make sure artificial intelligence is applied sensibly and in a way that promotes both human-centred learning and technology growth.

CONCLUSION

The rapid development of digital technology has drastically altered the organization and operation of higher education institutions around the world. This shift is reflected in the idea of Higher Education 5.0, which combines the latest innovations like artificial intelligence with contemporary teaching methods and human-centred pedagogy. The goal of this educational framework is to establish a more adaptable, creative, and student-centred learning environment that promotes critical thinking, creativity, and teamwork.

The findings of this research demonstrate how artificial intelligence is now a crucial tool for assisting with contemporary teaching methods. AI-based learning technologies give students more access to scholarly materials and let them investigate a variety of knowledge sources, which can help them enhance their analytical and critical thinking abilities.

Artificial intelligence also helps teachers organise course materials, give prompt feedback, and design more engaging and individualised learning opportunities for students.

However, while the integration of artificial intelligence has numerous benefits for higher education, it is critical to maintain a balanced approach to its application. In academic settings, an excessive reliance on technology may diminish face-to-face communication and give rise to ethical issues.

Therefore, rather than taking over the crucial job of educators, the successful integration of artificial intelligence should concentrate on enhancing conventional teaching methods. Considering everything, Higher Education 5.0 is a developing educational methodology that combines technology and human-centred instruction to improve learning outcomes and educate students ready for the demands of the contemporary digital age.

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