Use of Artificial Intelligence in Higher Secondary Education: Opportunities and Challenges in the Indian Context

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Abstract: *In India, the educational scenario began with the Gurukul system, which later transformed into the modern school system. The concept of schooling came to our country during British colonial rule. After many inventions and research developments, education entered a glorious phase. Nowadays, when we look at our surroundings, a new concept has emerged—AI, the abbreviation of Artificial Intelligence. It has been developing since the nineteenth century, and now in the twenty-first century, its progress has gone far beyond expectations and is still continuously advancing. Our education system is changing day by day, and we are accepting its positive aspects. In our country, development has taken place in almost all sectors. When this technology is properly used in the education system, it provides better opportunities to become more knowledgeable and empowered in every aspect. At the secondary level, education acts as a starting point for students to gain better experiences and opportunities. Through this, students can develop in all aspects and bring out their full potential. Artificial Intelligence has both positive and negative impacts on education. Although it helps students gain knowledge easily and efficiently, it also creates challenges such as data privacy issues, lack of trained teachers, high cost, and misuse by students. Therefore, its implementation must be carefully managed to ensure balanced development.*

Keywords: Higher Secondary Education, Artificial Intelligence, Digital divide, Edu tech India

I. INTRODUCTION

In the present situation, the world is becoming increasingly techno-driven. Many developed countries are using Artificial Intelligence to transform data and easily access essential information. In India, recent reports indicate that more than 65% of people use AI (according to, *IAMAI from 2024* to early 2026) and among teenagers the usage rate exceeds 70%. Artificial Intelligence promotes self-oriented learning. Therefore, it is important to integrate AI at the school level so that students can develop critical thinking skills and learn to use technology wisely. In the Indian context, some states—such as Madhya Pradesh, West Bengal, Uttar Pradesh, Goa, and Tamil Nadu—provide laptops and tablets to higher secondary-level students, which makes the implementation of AI applications easier and more accessible. The education system is no longer confined within four classroom walls; that era has passed. Today, education is globally connected through advanced technology, and Artificial Intelligence has become one of the most crucial components of this technological transformation. The implementation of AI in higher secondary schools supports personalized learning, instant assessment, and data-driven instruction. AI-powered platforms help students understand complex subjects, identify learning gaps, and receive immediate feedback. The successful integration of Artificial Intelligence in higher secondary education depends on robust digital infrastructure, comprehensive teacher training, and clear guidelines for ethical and responsible use. With these foundational elements in place, AI has the potential to foster a more inclusive, innovative, and learner-centered educational environment.

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II. LITERATURE REVIEW

Artificial Intelligence (AI) has emerged as an innovative tool in education, particularly at the higher secondary level. Research indicates that AI supports personalized learning by adapting content to individual students' needs and providing instant feedback (Luckin et al., 2016). Intelligent tutoring systems enhance academic performance by offering real-time assessment and customized guidance (Woolf, 2019). In the Indian context, the National Education Policy (NEP) 2020 emphasizes the integration of digital technologies, including AI, to promote skill development and future readiness (Government of India, 2020). However, studies also highlight challenges such as the digital divide, lack of teacher training, and concerns about data privacy (Zawacki-Richter et al., 2019). Overall, the literature suggests that while AI has strong potential to improve higher secondary education, its effective implementation requires proper infrastructure, training, and ethical guidelines.

III. OPPORTUNITIES FOR THE IMPLEMENTATION OF AI AT THE HIGHER SECONDARY LEVEL

Self-Paced Learning:
AI enables students to learn at their own pace, anytime and anywhere, without geographical limitations. It reduces dependency on others and promotes independent learning.

24×7 Learning Assistant:
Artificial Intelligence functions as a guide and instructor available 24 hours a day, 7 days a week. Students can access the required information anytime without hesitation and receive continuous academic support. AI acts as an assistant and mentor, providing guidance whenever and wherever needed.

Cost-Effective Learning Tool:
AI can be a budget-friendly educational resource, as students can access a wide range of information and learning materials at minimal cost. With a single subscription, learners may use AI-based platforms for an extended period, such as a month or a year, making it economically efficient.

Availability of Diverse Learning Resources:
AI provides access to a wide range of data and learning materials, helping students fulfil their academic needs and improve subject understanding.

Instant Assessment:
Artificial Intelligence allows students to assess their knowledge instantly through quizzes, tests, and real-time performance analysis.

Time-Saving Tools:
AI acts as a time-efficient tool by providing immediate access to information and learning support. Students can quickly clarify doubts without depending entirely on teachers or peers.

Immediate Feedback:
AI-based systems provide instant feedback on students' performance, enabling them to identify mistakes and improve without delay.

IV. CHALLENGES TO THE IMPLEMENTATION OF AI AT THE HIGHER SECONDARY LEVEL

Everything has both positive and negative sides. Similarly, Artificial Intelligence helps students fulfil their daily knowledge needs; however, it also presents several barriers and preventive concerns, which are mentioned below:

Acceptance issue: AI is often not fully accepted by administrative authorities due to limited awareness and understanding of modern AI tools. Additionally, a traditional mindset within the administration may not align with the technological expectations of Generation Z learners.

Data policy and privacy:
AI systems collect and store large amounts of data. Weak data protection policies may lead to privacy violations and misuse of personal information.

Lack of socio-cultural sensitivity at the secondary level:

AI tools may not always consider students' socio-cultural backgrounds, values, and local contexts, which are important in education.

Lack of trained teachers:

Many teachers are not adequately trained to use AI-based tools effectively in the classroom.

Misuse by students:

Students may use AI for unethical or antisocial activities, such as misusing photos, videos, or written content.

High cost and limited access:

AI technologies can be expensive, and not everyone has free or equal access to them.

Individual differences among students:

Every student has a different level of intelligence and learning ability. Over-reliance on AI may create a wider gap among learners due to these individual differences.

V. KEY INITIATIVES FOR PROMOTING AI IN INDIA

1. CBSE Curriculum Integration:

The Central Board of Secondary Education (CBSE) has introduced Artificial Intelligence as a subject from Class X to Class XII to promote digital literacy and future-ready skills among students.

2.Skilling for AI Readiness (SOAR):

2. This initiative targets students from Classes VI to XII and includes a 15-hour module focused on ethical AI learning and foundational AI concepts.

3.Youth for AI (YUVAi):

The YUVAi program aims to develop students' skills and encourage young learners to apply AI in real-world situations through innovation and practical exposure.

VI. SUGGESTIVE SOLUTIONS FOR THE IMPLEMENTATION OF AI

Strengthening Infrastructure

The government and educational institutions should ensure proper digital infrastructure, including reliable internet connectivity and smart classrooms, especially in rural and underprivileged areas.

Teacher Training Programs:

Regular workshops and training programs should be organized to ensure quality teaching. First, teachers need to be properly trained and their skills in AI should be developed so that they can effectively integrate AI tools into classroom instruction.

Policy and Ethical Guidelines:

Clear policies should be developed regarding data privacy, security, and the ethical use of AI in order to protect students' personal information and prevent misuse.

Curriculum Integration:

The government and policymakers must integrate AI systems into the curriculum. This will help students understand the actual value and real-world applications of Artificial Intelligence.

Awareness Programs:

Awareness campaigns should be conducted for students and teachers on a monthly or quarterly basis. This will increase psychological acceptance and positive attitudes toward Artificial Intelligence among both teachers and students.

VII. CONCLUSION

Artificial Intelligence is one of the most powerful tools for educational and technological advancement; therefore, it must be used properly and responsibly. The higher secondary level is a crucial stage in students' academic journeys, as it helps them choose the appropriate stream and career path. In this context, AI can function as an effective assistant by

providing guidance, resources, and personalized support. Students from diverse socio-economic backgrounds can benefit from AI if teachers provide proper direction and supervision. In the present era, technology acts as a powerful instrument for national development. Therefore, the effective and ethical utilization of Artificial Intelligence is essential for the overall progress of our country.

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