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# Impact of Artificial Intelligence (AI) in Development of Skills in Higher Education

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## **Abstract:**

*Education plays a pivotal role in the all-round development of a student. To ensure the quality of education, skill development is of utmost importance especially in higher education. The main objectives of the study are i) to find out the impact of AI in development of cognitive skills in students studying in higher classes, ii) to find out the impact of AI in development of technical skills in students studying in higher classes and iii) To find out the impact of AI in development of interpersonal skills of students of higher classes.*

*The research method used in this study is qualitative descriptive method. Data sources are collected from scientific journals, books mainly through library study techniques. The findings of the study shows that the integration and application of AI in the classrooms is helpful to make teaching and learning effective by supporting teachers and learners in the process through the usage of robotic technology and sensors. It is also found that AI when appropriately used at specified learning stages or to enable learning, can accelerate skill development.*

**Keywords:** AI, Skill development, Higher education, Cognitive skills, Technical Skills, Interpersonal Skills, Personalized learning.

## **1. Introduction:**

Traditional method of teaching often lacks the flexibility and personalization needed to cater to one's needs. Due to individual differences, we all have different interests, learning styles and knowledge levels. It is not justified to settle for a one-size-fits all approach in the teaching-learning process. The rapid advancement of Artificial Intelligence (AI) technologies is revolutionizing various sectors, including education. This active engagement with the material promotes deeper cognitive processing and enhances critical thinking skills (ADEA, 2006). The emergence of educational institutions strive to meet the diverse and evolving needs of learners in a rapidly changing world, AI emerges as a powerful tool capable of redefining traditional teaching and learning paradigms (Ahmet, G., 2023). This technological advancement also raises important questions about equity, privacy, and the role of human educators (Miguel, A., 2023). Schools that are expected to adapt to the digital age and embed 21st century skills in their main agendas are some of the main institutions that could be most affected by the development of artificial intelligence (AI-Tkayneh, et al., 2023). The impact of artificial intelligence (AI) on the

educational system is multifaceted and transformative, offering both opportunities and challenges. The flow diagram below shows the impact, challenges and applications of AI in higher education.

### 1.1 Development of Skills with AI:

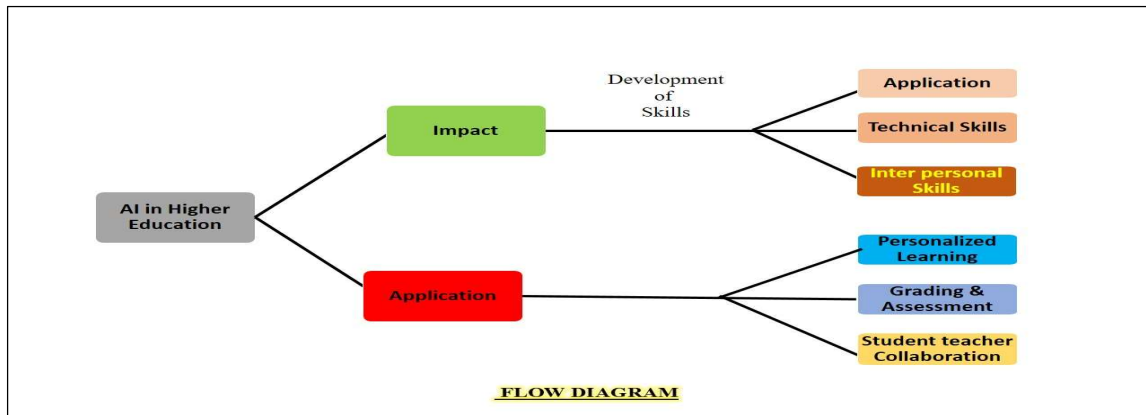


Figure-1: Development of Skills with AI

Skill development is of utmost importance in education, because it is the outcome of learning and what a degree represents. Academic leaders should be confident that students educating from an institution with the skills they need to progress in their learning journey, whether through further schooling or in the workplace. In [psychology](#), the four stages of competence, or the "conscious competence" learning model, relates to the psychological states involved in the process of progressing from incompetence to competence in a [skill](#). Many skills require practice to remain at a high level of competence (Bates, T., et.al.,2020). The four stages suggest that individuals are initially unaware of how little they know, or unconscious of their incompetence. As they recognize their incompetence, they consciously acquire a skill, then consciously use it. Eventually, the skill can be utilized without it being consciously thought through: the individual is said to have then acquired unconscious competence. The hierarchy of competence are arranged as a pyramid which is shown in the figure below:

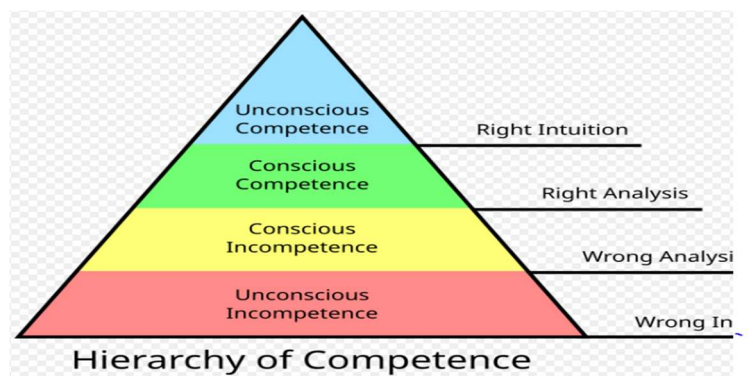


Figure-2: Levels of Competence

Source: [https://en.wikipedia.org/wiki/Four\\_stages\\_of\\_competence#Stages](https://en.wikipedia.org/wiki/Four_stages_of_competence#Stages)



### 1.2 Development of Skills in Higher Education:

- i) **Cognitive Skills:** Cognitive skills reflect student understanding of concepts. They are the fundamental abilities that enable individuals to process information, solve problems, and make decisions. This active involvement encourages deeper cognitive engagement and enhances students' critical thinking abilities.<sup>7</sup>
- ii) **Technical Skills:** Students exhibit technical skills when they can write, read, engage in lab experiments, or use computer software. These are skills students learn through training and experience. When it comes to technical skills development, AI writing tools present a unique opportunity
- iii) **Interpersonal skill development:** Researchers and computer scientists are in the process of creating AI software that “provides real-time, sentence-level feedback on text, including suggestions to make it more empathic” (Boynton, 2023). AI begins to power tools that provide feedback on language, so there is surely impact of AI on interpersonal skills development in education.

### 1.3 Application of AI in Higher Education:

Artificial intelligence (AI) and the use of artificial intelligence are becoming more accepted in every aspect of our lives, from daily, at-home tasks to work, including the use of artificial intelligence in higher education<sup>10</sup>.

The application of AI has attracted great interest in HE which is highly influenced by the development of information and communication technologies (Alajmi et al., 2020). Schools are also able to stay adaptive and focused on their students through this new technology.

### 1.4 Personalized Learning (Hennekeuser, D.et. al.,2024):

AI enables personalized learning experiences by adapting educational content to meet the needs of individual students. Through the use of machine learning algorithms to evaluate data and find trends in students' learning behaviors, preferences, and accomplishments, artificial intelligence (AI) plays a crucial role in personalized learning (Hasim, S., et.al., 2022). AI is able to suggest relevant learning materials, point out areas that need work, and modify the degree of difficulty of learning assignments. While advanced students might be pushed at their level, struggling students can benefit from personalized instruction to help them catch up (Harry, A.,2023).

## 2. Literature Review:

The Impact of Artificial Intelligence in Educational System, International Journal of Scientific Research in Science and Technology. Artificial Intelligence (AI) has the potential to enhance the learning process by facilitating collaboration between teacher and students Bit, D. Biswas, S., Nag, M., (2024).



AI can offer real-time analytics and insights, which can assist educators in identifying students' strengths, weaknesses, and learning patterns. Based on this information, educators can modify their teaching strategies accordingly. AI can act as a brainstorming partner, helping educators come up with creative solutions to support student learning. AI technology can assist educators in responding to a range of queries from students during class. It can be said that every student can be provided a more individualized, effective, and efficient learning experience by balancing the advantages and disadvantages of artificial intelligence in the classroom. Yusuf, Samuel & Abubakar, Justina & Durodola, Remilekun & Ocran, Godbless & Hadassah, Adedamola & Yusuf, Prosper. (2024) have describe about Impact of AI on continuous learning and skill development in the workplace: A comparative study with traditional methods. The development of AI technologies in learning have dramatically changed how organizations approach employee development.

AI has become part and parcel for enhancing learning experiences, personalizing training, and improving skill acquisition (Ou, 2024). The findings highlight both the transformative potential of AI and the enduring value of traditional methods, giving an exquisite understanding of how these proceed towards and can be manipulated for ideal learning outcomes.

Christou, P. (2023) has also given importance in the Use of Artificial Intelligence (AI) in Qualitative Research for Theory Development. The aim of this paper was to investigate how AI can contribute to theory development. So far, researchers have yet to fully explore the dynamics of AI in the context of theory building, leaving considerable gaps in how it may be constructively used in theory advancement. The aim of this paper is a critical methodological perspective was employed since it allows researchers to critically examine the depths and linkages of phenomena, procedures, or constructs as the nexus of AI theory development.

Ravishankar. k., Logasakthi.k., (2023), had conducted a Study on Impact of Artificial Intelligence on students' sustainable education and career development using extended toe framework. In this study, the authors identified and believed that the technology–organization–environment framework (TOE) model best suit for the study. This approach justifies that an institution decision to implement new technology will be affected by technology–organization–environment (Baker, 2011). This study will help in understanding the awareness and impact of AI on students.

Aftab.A., Hasan.M.,Md. Raja. M., (2022), had also conducted a Study on Impact of Artificial Intelligence (AI) on Education: Changing Paradigms and Approaches Towards Excellence. Like other technological innovations, artificial intelligence also plays a key role in the field of



education through improving teaching and learning and big data is working a fuel. Artificial intelligence (AI) technology facilitates inclusive and equitable quality education along with ensuring universal access to life-long learning for all across the world. AI-based technology has reached into the classroom and greatly affected the teaching and learning process. The personalized learning system is increasingly growing in learning centers and educational institutions across the world and it has a far-reaching impact.

Hashim, S., Omar, M. K., Ab Jalil, H., & Mohd Sharef, N. (2022). Trends on Technologies and Artificial Intelligence in Education for Personalized Learning: Systematic Literature Review. The systematic review results have shown that the number of publications related to technology and AI for personalized learning in education is becoming more common in study and practice from 2019 onwards. This study sums up the trend of a personalized learning environment, stressing on the qualities, assistive technology, and applications built by AI for personalized learning. The findings also show how personalized learning was used and the objectives that made it work.

Seo, K., Tang, J., Roll, I., Fels, S., & Yoon, D. (2021). The impact of artificial intelligence on learner–instructor interaction in online learning. The goal of this study is to gain insight on students' and instructors' perception of the impact of AI systems on learner–instructor interaction (inter alia, communication, support, and presence; Kang & Im, 2013) in online learning. In this study, they found that students and instructors perceive the impact of AI systems as double-edged swords.

Gocen, A., & Aydemir, F. (2020). Artificial Intelligence in Education and Schools. When the data was analysed, it was first seen that the participants firstly emphasized the products, applications, and outputs that will enter our lives with the arrival of artificial intelligence. Since participants touched upon many aspects under products, drawbacks, benefits, suggestions, they tried to give a few general quotations under each dimension that covers the theme.

Southgate, E., Blackmore, K., Pieschl, S., Grimes, S., McGuire, J. & Smithers, K. (2018). *Artificial intelligence and emerging technologies in schools: A research report*. Erica Southgate et.al. (2018) found that AI could potentially offer benefits to teachers and students in the form of personalised learning and pedagogical agents designed to deliver appropriate and sequenced content and feedback to learners. Teachers, school leaders and policy-makers should begin to engage with developments in AI for education and society, in order to empower their students in the present and for future change.



### 3. Objectives of the Study:

The main objectives of this article are:

- i) To find out the impact of AI in development of cognitive skills in students studying in higher classes,
- ii) To find out the impact of AI in development of technical skills in students studying in higher classes
- iii) To find out the impact of AI in development of interpersonal skills of students of higher classes.

### 4. Methodology of the study:

Methodology encompasses concepts such as paradigm, theoretical model, phases and quantitative or qualitative techniques.<sup>16</sup>This work is based on secondary sources. The research method used in this study is qualitative descriptive method. Data sources are collected from paper books, book chapters, journal articles, conference proceedings, newspapers and information available in public domain have been reviewed. By studying and analyzing information from different sources, some justifications has been presented in this article.

#### 4.1 Data Collection: Document Analysis

Title	Aims/ objectives of the study	Data Source
Artificial Intelligence in Education and Schools	To uncover the opinions of the participants in regard to the AI in education	Research on Education and Media Vol. 12, N.i, year 2020 ISSN: 2037-0830 DOI: 102478/rem-2020-0003
The Power and Challenges of AI integration in Higher Education	How can AI be used in the classroom to differentiate learning and should students be explicitly taught how to use AI tools? How can teachers help students to improve their skills for career in AI world?	University of Bridgeport NEWS
AI Powered Personalized Learning: Toward Sustainable Education	The study examines the key challenges and harness the opportunities that AI offers when utilized to personalized students learning experiences optimize instructional delivery sand improve assessment practices	Springer Nature (link . springer.com/chapters// 10.1007/978-981-99-8572-2_5
AI Integration in Medical Education: A Pan- India Cross Sectional Observation Understanding among Students.	The study aimed to assess the acceptance and understanding of AI integration among students in medical education across different regions in India through a Cross-sectional observation	Sharma et.al. Scr Med2023 Dec; 54 (4): 343-52



## 4.2 Analysis of collected Data:

Analysis of collected Data is done through document analysis. A systematic and minute examination of textual information was undergone to find the underlying meanings, objectives of the study, related objectives of the study and findings. The findings were further interpreted within the broader context of the objectives. The limitation and implications of the analysis were also taken into consideration.

## 4.3 Findings revealed from the data sources:

- i) Cognitive skills reflect student understanding of concepts. It is found that AI writing tools can provide scaffolding for writing assignments. It is used to create portions of an assignment like a thesis statement (alongside an appropriate citation). It helps to brainstorm ideas. AI can also provide literal scaffolding for writing with an outline. Artificial Intelligence (AI) has the capability to accelerate the learning process by facilitating collaboration between teacher and students. AI also offer present analytics and insights, which can help the teachers to identify students' strengths, weaknesses, and learning styles. Depending on the information collected, the teachers can modify their teaching strategies accordingly.[29] Artificial Intelligence (AI) bridges the knowledge gaps and offer satisfying answers to the queries raised by the students.<sup>17,18</sup> Teachers are also exploring how AI can enable writing or improving lessons, as well as their process for finding, choosing, and adapting material for use in their lessons-plans.<sup>19</sup>
- ii) It is found that the development of technical skills improves the process of acquiring new knowledge and abilities in technology-related areas, like programming languages, software applications, data analysis tools, or specific industry-related technical skills, through training, practice, and ongoing learning to enhance one's professional capabilities in a technical field. This involves learning how to use specific software, hardware, or platforms relevant to your job role. Beyond theoretical knowledge, technical skills development emphasizes hands-on practice to gain proficiency in applying the learned concepts. It is observed that technical skills development through AI can help a student in many ways:
  - Learning a new programming language: like Python or Java
  - Mastering data analysis tools: like SQL or Tableau
  - Acquiring proficiency in cloud computing platforms: like AWS or Azure
  - Attending workshops on emerging technologies: like artificial intelligence or machine learning.
- iii) The impact of AI on interpersonal skills development in education is obvious through power tools that provide feedback on language. AI can develop interpersonal skills beyond text by letting AI tap into any conversations, either voice, video, or text.





Medical science, too, is looking at ways to use AI to increase empathy when it comes to patient care and clinical skills training.<sup>20</sup>

#### 4.4 Interpretation:

The purpose of the study was to obtain a deeper understanding of AI and its impact in development of skills in Higher Education. AI can significantly impact cognitive skills which reflect the understanding of concepts of students. Since this qualitative descriptive research and conducted through various information, findings are believed to be valuable and responsible outline of how AI put impact the field of technical skills of students. The human factors become important when we have AI which helps to develop the interpersonal skills. AI will make the profession of students more powerful through conversations either text, .... Or video. It would be interesting to research the knowledge of AI and its important on development of more skills in higher education.

#### 5. Conclusion:

In closing, AI in education has numerous advantages in the field of skill development in higher education. The integration of generative AI tools in education represents a transformative shift towards more dynamic, personalized, and effective learning environments. AI enhances students' problem-solving abilities and critical thinking. These tools enable students to engage deeply with the material, apply their knowledge in practical contexts, and develop essential cognitive skills that are crucial for academic and professional success. AI tools contribute to personalized learning by tailoring educational experiences to individual student needs systems in the classroom. We can give every student a more individualized, effective, and efficient learning experience by balancing the advantages and disadvantages of artificial intelligence in the classroom. Together, we can drive innovation, solve complex problems, and make a positive impact in the world.<sup>21</sup>

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