Is AI a Challenge in the Cognitive Development of Youths in the Present Scenario?

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Abstract: Artificial Intelligence (AI) means to the growth of computer applications to make capable for conducting the work which requires basically human minds. These tasks include learning, reasoning, and problem-solving, understanding natural language, and even perceiving sensory inputs like vision or sound. The connection between Artificial Intelligence (AI) and mental development lies in the interplay between how AI technologies mimic, influence, and enhance human thinking processes. Cognitive development, which refers to the growth of mental abilities like reasoning, problem-solving, memory, and decision-making, is both impacted by and a foundation for AI's design and application. The present paper focuses on vivid segments that a youth have to face in their intellectual growth. Youth mental progress is a dynamic process impacted by biological, psychological, and environmental factors. During this stage, vivid transformative segments or phases occur, shaping how young people think, learn, and interact with the world. Each segment is interrelated, and progress varies depending on individual circumstances such as family environment, education, cultural background, and access to supportive relationships. Recognizing and supporting these stages can foster healthy cognitive and emotional development among the youth.

Keywords: *Cognitive Development, Artificial Intelligence, Transformative Segments, Decision-Making, Foster & Human Intelligence.*

I. INTRODUCTION

As people are sustaining in an age where everything based on challenges and connected with the different approaches of innovative techniques in teaching and learning process [5]. The implication of Artificial Intelligence (AI) in the present dynamic educational scenario has become a powerful & essential catalyst, with the potential to eradicate completely various conventional approaches in the field of education. The enhancement of cognitive development among students is an area where AI has significant potential [6]. The frequently development of artificial intelligence (AI) is profoundly converting human intelligence in the field of education. In the "Notification of the State Council on issuing the development strategies for the upcoming generation of "Artificial Intelligence" and the 2017 National Higher Education Science and Technology Work Conference, the government emphasized the importance to guide universities to aim at the forefront of world science and technology, strengthen basic research, achieve significant breakthroughs in forward-looking basic research and leading actual achievements, and further enhance the potential of universities in AI field in terms of technological innovation, building talent & providing national needs. While teaching English in the college & the AI technology is immensely being applied and has shown its abundant potential. Traditional college English teaching faces various challenges, such as low proportion of teaching resources, low student learning interest, and difficulties in personalized learning. AI technology, through applications such as giving personalized learning experiences, intelligent teaching assistance, and online learning resources, brings number of possibilities to college English teaching.

However, the emerging techniques of AI implications can also have a negative impact on conventional college English teaching. For example, students may be more inclined to use online learning resources and self-learning tools, avoiding traditional face-to-face teaching. Additionally, the enhancement of machine translation technology may hamper students' language expression and grammar mastery. Therefore, it is important to implement in-depth research on the challenges of AI technology on college English teaching to understand its relevance impact and developing different corresponding strategies [8].

II. AIMS OF THE STUDY

- To search the factors of AI tools in teaching learning method.
- To analyze the pros & cons of AI tools on students' educational and real-life assessment.
- To explore excessive use of AI implications which are affecting students learning knowledge?
- To provide plans to maintain balance and the utilization of AI tools and mitigate the negative effects [9].

➤ *To Search the Factors of AI Tools in Teaching Learning Method.*

The study of AI and Machine Learning and its integration in the classroom have led to many developments. These technologies now argument the learning interactions of all students globally, enhancing possibilities opened for teaching and the design of educational experiences. The programming element enables students who use this robot to develop their computational and analytical skills as well as the algorithmic thinking of the student [10].

Both quality instruction and quality intervention are crucial for assessing all students are completely ready for succeeding in academic & profession. Artificial Intelligence (AI) provides the potential to support in the development of curriculum and preparing lesson plans to understand student potential and the level of difficulty during the learning methods. One way to think about AI when developing curriculum and making intervention decisions is through a framework such as Student, Environment, Task, and Tool [11].

The root cause for effective learning panorama is affecting strategies and evidence-based decision-making. AI can be utilizing to develop lesson plans easily and efficiently. However, the authencity of the prompt used to elicit the plan directly correlates to whether the resulting plan is relevant and appropriate for the student academic activity. Consider two examples of how prompts can change the response. In the first example, the prompt lacks specificity; therefore, ChatGPT determined the lesson length, selected the grade-level standards to be addressed, and provided a generic lesson. In the second example, the prompt was much more specific, resulting in a detailed plan that offers more scaffolding, multiple options for student engagement, and is more likely to meet the needs of all students in the 8th grade science class [11].

➤ *To Analyze the Pros and Cons of AI Tools on Students' Educational and Real-Life Assesment.*

The observation indicates that AI can provide important advantages, such as a personalized learning, enhanced academic outcomes, and enhancing student interest. Nonetheless, there are issues like over dependency on AI, vanishing cognitive technique, information compromise hazards, and also identified were the issues of academic dishonesty. The rapid development of Artificial Intelligence (AI) is exchange of several industries, and education cannot be an exception. AI is crucial in the medium and Higher education, which impacts on the education of students, being a boost to its development according to a combination of prospects. Problems (Edtech, 2020). Personalized learning experience to intelligent tutoring which offer individualized direction, accompaniment, and assessment on the basis of personal learning characteristics and the knowledge rates The AI can (Hwang et al., 2020), change the education landscape (Holmes et al., 2019). Respond to the different needs of learners. However, good education results are not assured only through the implementation of new AI practices. Castaneda and Selwyn, 2018; Du Boulay, Selwyn, (2016); 2000). Implementation of AI into the creation of academic environments creates important questions about to justice, access, and changing position of conventional didactic (pedagogical) forms [12].

As the usage of AI implications to escalate in the educational ground, it's important to address the negative impacts on students' academic performance. The Students activities and engagement in academic domain plays a vital role for their holistic development, the adoption of AI tools in the academic activities can be encourage until it will become more reliant. Over-reliance on AI tools by the students for the achievement of their academic goals cannot be result oriented in psychological development, disappearance of the traditional skills such as handwriting skills, memorization and math solving skills which are still important for academic growth. Moreover, the over-reliance of AI tools may lead to concern about ethical issues such as privacy of the students. These AI tools collect personalized information of the students without their acknowledgement that is possible to misuse their sensitive information therefore addressing ethical concerns cannot be ignored in the view to establish safeguard among student well-being and rights. [9].

➤ *To Explore Excessive use of AI Implications which are affecting Students Learning Knowledge*

Artificial Intelligence (AI) tools have revolutionized the educational landscape by providing students with instant access to resources, personalized learning pathways, and interactive platforms. However, excessive reliance on these tools can significantly hinder students' learning productivity by impairing their critical thinking, problem-solving abilities, and self-discipline. One major issue is the decline in cognitive engagement. AI tools often provide quick answers to questions, bypassing the need for deep thought or exploration. This may lead to learners making it possible to develop a shallow knowledge of topics. As they fail to engage with the complexities of the material. For example, relying on AI to solve mathematical problems or write essays diminishes opportunities for practice, which is essential for mastering foundational skills.

Additionally, excessive use of AI tools can reduce students' ability to manage time effectively and prioritize tasks. AI-driven platforms often offer features such as auto-reminders, scheduling tools, and instant responses, which can foster dependency. Over time, students may struggle to develop the self-discipline required to plan and execute

tasks independently, a skill crucial for long-term productivity and success.

Another challenge is the distraction caused by AI-enabled applications. Many educational AI tools are integrated into digital ecosystems that also host entertainment platforms, leading to frequent distractions. For instance, students using an AI-based study app might be tempted to switch to social media or gaming platforms due to proximity and ease of access. This multitasking environment significantly hampers focus and retention, further reducing productivity. Furthermore, AI's personalized learning paths can inadvertently isolate students from collaborative learning experiences. Group discussions, debates, and peer interactions are critical for developing communication and teamwork skills. However, when students excessively depend on AI for individualized instruction, they miss out on the cognitive and social benefits of collective learning.

> *To Provide Plans to Maintain Balance and the Utilization of AI Tools and Mitigate the Negative Effects*

During this technological era, the living standard & profession has been transformed including education, The AI tools have made the academic activities easy and quicker. Moreover, it has made the teaching learning process more efficient and effective to students in their academic phase. Additionally, the prevalent of the AI tools offers numerous benefits, such as personalized learning experiences, adaptive learning, immediate feedback, accessibility of information, enhance engagement in the learning. [9].

However, it's important to coordinate between utilizing AI tools and incorporation of conventional learning methods in favor of academic and real-life performance of the students, traditional learning methods such as in personal learning, face to face interactions, group discussions, hands on practice, and Seminars. This traditional method promotes critical thinking that motivates learners to engage physically in developing problem solving skills & decision making skills. A value based education among the students also enhances when it came to traditional learning process at it plays a vital role in social interaction and ensures their emotional intelligence which is essential to connect with the society and in work premises. These skills are essential for the students to survive and successful in the real life. Moreover, solely depending on AI tools may hampers the students critical thinking, discourages their independent thinking abilities, decision making skills and problems solving skills which is essential for their successful academic and real-life scenario.[9]

III. THE RELATIONSHIP BETWEEN COGNITIVE DEVELOPMENT AND ARTIFICIAL INTELLIGENCE: CHALLENGES ACROSS DIMENSIONS

Artificial Intelligence (AI) has become an integral part of the modern world, influencing how individuals, particularly youths, think, learn, and interact. While AI offers substantial benefits, its pervasive integration poses significant challenges to cognitive development, impacting foundational mental processes such as memory, attention, creativity, and social intelligence.

One critical challenge is the over-reliance on AI tools for information retrieval and problem-solving, which undermines memory retention and critical thinking. With AI providing ready-made answers and solutions, the effort required for deep cognitive engagement is diminished, leading to a decline in skills like reasoning and analytical problem-solving. Similarly, AI-driven platforms that reward immediate gratification—such as social media apps with infinite scrolling and recommendation algorithms—foster shorter attention spans and a tendency towards distraction. This undermines the ability to sustain focus on complex tasks, an essential skill for cognitive maturity.

Creativity, often heralded as a uniquely human trait, also faces challenges in the age of AI. While AI tools can generate ideas and assist in creative endeavors, they often operate within predefined parameters, limiting opportunities for truly novel or divergent thinking. Over time, excessive reliance on such tools risks stifling originality and reducing youths' willingness to explore unconventional solutions independently.

Social and emotional development is similarly affected by AI's influence. AI-driven communication platforms and virtual assistants have reduced face-to-face interactions, leading to weaker interpersonal skills and diminished emotional intelligence. Youths may struggle to interpret nonverbal cues or engage in meaningful conversations, as much of their interaction occurs through AI-mediated environments. Additionally, the curated content provided by AI algorithms often promotes unrealistic standards and comparisons, negatively impacting self-esteem and identity formation.

Ethical and moral development also faces challenges due to AI's pervasive role. Exposure to biased or unregulated AI content can shape worldviews in potentially harmful ways, while the absence of ethical reasoning in AI systems may desensitize users to the moral implications of their decisions. Furthermore, the reliance on AI for multitasking can overload cognitive processes, diminishing the brain's natural ability to prioritize and process information effectively.

IV. EXPLAIN THE CONCEPT OF COGNITIVE DEVELOPMENT AND ITS IMPORTANCE AMONG THE YOUTH

Development is a process to improve functional efficiency of cognitive growth. Cognition relates with ideation and memory and it is roadmap to perceive, comprehend, and conceive or simply to know. Cognitive development means the capability of knowing, comprehending or understanding [13].

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➢ *While Developing the Cognitive theory, Piaget made some Assumptions about Children which include*

- Based on their learning environment, children build their level of knowledge.
- Children learn things through natural acceptance.

By nature, children are motivated to learn. The four basic elements in cognitive development are Maturation, Experience, Social transmission and Equilibrium.

V. STAGES OF COGNITIVE DEVELOPMENT

As per Piaget's theory Cognitive Development occurred distinct stages. The stages happen in the same order and no stage is skipped. Every stage is a reflection of previous stage. Stage defined by Piaget age specific and includes goals expected by children in a stage [15]. According to Paiget's Cognitive theory, there are 3 components in adaptation namely:

- Equilibration
- Assimilation
- Accommodation.

Adaptation is inborn tendency to adjust same environmental conditions [14]. Equilibration is a force that incorporates cognitive development, which is not steady but there are leaps and bounds [13]. When a child's schemas can deal with most new information Equilibrium is attained [15]. Assimilation is using an existing schema to deal with a new situation. It is incorporating into an existing schema. [16].

VI. EDUCATIONAL IMPLICATIONS OF PIAGET'S THEORY

Piaget's theory suggested educational development appropriately where education relate with environment, curriculum, materials and instruction consistency with student's physical and cognitive abilities [11]. Children learn by taking part in vivid activities, which emphasized the importance of different phases of learning which are

- Discovery learning - freedom to explore and discover knowledge
- Problem solving - content should be taught in the form of problems.
- Projects- using projects as a means to learn.
- Activity based method should be used and teacher is considered as facilitator.
- Stage Based teaching: identifying cognitive level and teaching students accordingly.

VII. PIAGET'S THEORY OF COGNITIVE DEVELOPMENT VS ARTIFICIAL INTELLIGENCE

The educational implications of Piaget's theory of cognitive development emphasize stage-appropriate learning, where teaching aligns with the learner's developmental level—fostering active, hands-on experiences, peer collaboration, and scaffolding to promote intellectual growth. In the present scenario, these principles remain relevant but face challenges due to the rapid integration of Artificial Intelligence (AI) in education. AI transforms learning by offering personalized content, adaptive feedback, and expanded access to resources, enabling students to progress at their own pace. However, its reliance can potentially hinder critical thinking and creativity if it diminishes opportunities for independent exploration. While Piaget's framework highlights natural developmental processes and social interactions as central to cognitive growth, AI often shifts the focus to efficiency and instant information retrieval. To maximize educational outcomes, a balanced approach is needed—leveraging AI to support individualized learning while adhering to Piagetian principles to ensure holistic, intellectual and moral development.

VIII. HOW AI IMPACTS DIFFERENT PEOPLE DIFFERENTLY

The impacts of AI keep being different in favor to gender, age, race, mental health and neurodevelopment profiles, as well as life experiences [1].

Researchers, educators, and AI experts rapidly coordinate to develop and implement innovative strategies to abilities of the young learners. This paper aims to review the current trend of adopting AI within the education system, and how such technologies can benefit children that align with their developmental stage [2].

AI plays a vital role in the development of curriculum. It helps in modulating and framing educational contents for the needs and learning patterns of individual students. By analyzing the given data, AI can identify patterns and assessment in student performance, allowing educators to make informed decisions about what content to include in the curriculum. In addition to this, AI is also providing individual feedback for educators to develop courses that meet students' changing demands [2].

IX. VARIOUS INSIGHTS WITH AI

- **AI and Learning:** AI & learning has a strong connection which can improve a technical ability among the students by which they can enhance their strengths, and grow their knowledge and skills [3].

- **AI and Teaching:** Educators & AI plays an important role in teaching & learning scenario, now a day's teaching in the classroom is at much ease with the use of AI at different level [3].

- **AI and Wellbeing:** During Covid-19 pandemic AI helps in regulating the online classes with the help of different platforms like Google meet & Zoom applications etc. Moreover, it was not limited only in the field of teaching & learning process rather it provide the different facilities like medical, business & research etc. [4].

- **AI in Employment:** In the present scenario employment is totally based on the digital skills & the demand of the market. In favor to this young people have to face new challenges in relation to employment, for example: for example algorithmic filtering of job applications or CVs. This is already visible in the spread of AI-driven recruitment applications that offer employers the possibility to automate the selection of applicants [4].

- **AI in Higher Education:** Relation between Artificial intelligence (AI) & higher education is very complex. As it is using multidimensional in different sectors likewise, it is promoting & utilizing in higher education as per need & demand which make the educational process easier & faster with in stipulated timeline. The conventional method of teaching & learning has been completely taken over by AI in present system of higher education [7].

X. CHALLENGES THROUGH AI IN ENGLISH LANGUAGE LEARNING

In this fast pacing world AI is challenging according to the needs of the human society. While teaching English in colleges, it has shown its abundant potential by fulfilling all the limited responses into a new changing an emerging curriculum [8].

As discussed earlier, the impacts of AI foster on different dimensions of teaching learning process in the lives of educators & classroom teaching. While teaching English at the college level there is certain perimeters which hampers the learners to interpret the sounds in a effective way. For this, through these perimeter educators become aware of the recent challenges which are mentioned below: [8].

- Speech Recognition

- Grammar and Spelling correction

- Students' Dependence on Online Learning Resources

- Lack of Interpersonal Communication

- Lack of Language Proficiency & Ability

XI. CONCLUSION

The present paper delves into the changing scenario of teaching & learning English in the classroom Vs impact of AI in the language teaching & learning. Now a day with the use of AI students are totally dependent rather than using utilizing their own skills in the development of thoughts & ideas. Due to which, they cannot even interpret the language clearly. It is just breaking down their backbone on their intellectual & analytical basis. Therefore, AI can be used in the form of a base rather than that depending on the building that is totally dependent on the base.

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