

# Harmonical Blending of AI and Critical Thinking to Support Human Intelligence

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**Abstract:** The role of artificial intelligence(AI) has expanded tremendously in the past decades in every part of the world. Critical thinking is a human ability which provides context for education, learning, and the thinking process of an individual. Many practices and policies have been suggested to provide AI as a foil for HI (human intelligence) by developing the critical thinking skills of the new generation through teaching and education. This study intends to study and answer the questions in reference to Artificial Intelligence such as (i) what is AI and is AI snatching jobs from us? (ii)how do we upgrade our education and learning methods so that we can boost our thinking skills? ,(iii) what are the ways to merge AI(artificial component) and critical thinking skills(human component)? A rising fear of AI which has accomplished so much in a small amount of time has compelled many people to detract from it thoroughly. The most preferred and appropriate solution would be integrating AI and critical thinking together so that the virtual employees and supporting tools will be utilized by real employees which can help save time, and energy and boost efficiency. Critical thinking skills can be established in the students by giving them assignments and ample opportunities to practice their already learned principles and apply their own judgment while figuring out the answers. For evenly distribution of the mixture of AI and critical thinking, in the workplace and in educational institutions, work that AI has trouble replicating, has to be given to the human employees.

**Keywords-**Artificial Intelligence, Critical Thinking Skills, Human Intelligence, Educational Institutes, Working Sector

## Introduction

The role of artificial intelligence(AI) has expanded tremendously in the past decades in every part of the world. It has advanced, evolved throughout the years after it was officially introduced in the 1950s, and has seeped into our daily lives without us even noticing it. It has been depicted in movies, novels, and works of literature as the science of the future but recently it

has gained a reputation as a real-life science when AlphaGo, an artificial program, won in a match against the international Go Champion Lee Seedol in 2016. Since then, the public became aware of the potential of artificial intelligence as it is applied in various sectors of society such as traffic control, banking, surveillance, astronomy, education, healthcare, etc.

Critical Thinking is an ability of humans that enables them to think, learn and comprehend the objective of a problem statement. It consists of several progressive correlated capabilities, tendencies, and other factors such as pre-hand knowledge, context, aim, etc. inspection, the study of proof or proving, testing, observation of the results, and reviewing before reaching conclusions are the necessary processes required for critical thinking according to Jonathan Michael Spector and Shanahan Ma (2019)[1]. .

In consideration of the many fears raised against the rapid rise of AI and robotics in almost every industry and the increase of unemployment cases which according to many specialists will occur because of the replacement of human employees with artificial ones, it was presented by Komolafe Blessing and Qian Xusheng (2020)[9], that AI is a highly considered topic up for discussions at international conferences and unions such as the UNESCO, the Austrian council, the United Union, and the OECD.

Many practices and policies have been suggested to provide AI as a foil for HI (human intelligence) by developing the critical thinking skills of the new generation through teaching and education. Improving the critical thinking skills of employees and freshers has also become a major goal of organizations and companies to balance the advantages and efficiency of AI with the supervision of original human intelligence.

## **Purpose of the Study**

This study intends to study and answer the questions in reference to Artificial Intelligence such as

- (i) what is AI and is AI snatching jobs from us?
- (ii) how do we upgrade our education and learning methods so that we can boost our thinking skills?
- (iii) what are the ways to merge AI (artificial component) and critical thinking skills (human component)?

We will do literature reviews on AI and critical thinking in teaching and in healthcare.

## **Method**

This study utilizes the document analysis research method. To answer the questions that the article intends to study, analyzing and reviewing several digital and internet-based articles and research papers are employed. The views of Spector, J.M., & Ma, S. in their article "Inquiry and critical thinking skills for the next generation: from artificial intelligence back to human intelligence" and the statements of Jen Hwang, Haoran Xie, Benjamin W. Wah, Dragan Gašević, made in their article of "Vision, challenges, roles and research issues of Artificial Intelligence in Education" are used as the foundation of this study and we assess and appraise them by examining other related articles.

## **Theoretical approach**

AI (Artificial Intelligence) is an evolution of the basic machine introduced in the 20<sup>th</sup> century which in the early days was operated manually by workers but now can imitate human capabilities, thinking and behavior. While it still can't take decisions on its own, it can supply recommendations and prepare references for its user by taking note of their behavior pattern and identifying them by going through repeated training procedures." AI can be of three types, (a) Artificial Narrow Intelligence which can perform singular tasks like face and sentiments recognition, (b) Artificial General Intelligence, known as Deep AI, which mimics human intelligence and behaviors, with the ability to learn and apply its intelligence to solve any problem and lastly (c) Artificial Super Intelligence which can surpass human capacity. Till now, only Artificial Narrow Intelligence has been successfully utilized" Eban Escott(2017).

As expressed earlier, critical thinking begins when a person encounters a problem and he/she commences to resolve it by observing the situation, evaluating the evidence, questioning, gauging information from the environment, and applying high-level thinking skills like logical reasoning, comparing results, and producing solutions after many reviewing and reconsiderations. It is stated by J.M Spector and Shanshan Ma(2019) [1] that critical thinking comprises of two types of inclinations: initiating and internal dispositions. the former leads to startup of investigations that lead the way to critical thinking while the latter helps to strengthen critical thinking skills. These two provide support to critical thinking skills so that they can be applied to the education and job industry which results in a person being able to scrutinize and question statements and then they can reach their own conclusions.

## **Reflection of human intelligence**

HI aka human intelligence is a huge mechanism consisting of critical thinking skills, memory, flexible intelligence, creativity, curiosity, self-awareness as in metacognition, communication, solving ability, etc.

A human can have innate talent of intelligence or acquire it by learning and experiencing things and become from being a beginner to one of the experts. Learning is the process of excluding misinterpretations and incorrect results while finding an answer to a problem. For example, to solve a quadratic equation by the factoring method, we have to assume all values are the answers to the problem and prove one by one which ones are the real answers and which ones are incorrect.

HI has evolved throughout the centuries and become what is today, whereas AI, which is based on the HI and only came around for some decades, is racing with HI to become the more prominent intelligence. Its growth has exceeded expectations and has created a danger of overpowering the original intelligence and replacing humans who were their creators.

A rising fear of AI which has accomplished so much in a small amount of time has compelled many people to detract from it thoroughly. They are anxious that AI can succeed and replace people from their jobs and become a powerful tool for the rich and control and suppress the average person. While it is a farfetched theory as HI still outperforms AI, it can be a mirror of the near future as AI is more profitable than the human workforce, is cost and labor efficient, and does not need rest. It can reach remote areas and once developed, can operate on various platforms.

These reasons are both for and against AI as we need AI in this digital age and without it, our technological developments would cease.

The most preferred and appropriate solution would be integrating AI and critical thinking together so that the virtual employees and supporting tools will be utilized by real employees which can help save time, and energy and boost efficiency. This arrangement also helps in advancing the critical thinking skills of the person.

Critical thinking, Creativity, Collaboration and Communication are the four constituents of Critical Thinking Skills[4].

Communication can be conducted in various ways and not just by physical interactions. Presentations, emails, posts, comments etc. can also be used to convey information and intentions of the sender. Critical thinking signifies the evaluation and manipulation of both kinds of data: data that is given to an individual person or data that is stored electronically in processor memory such as databases. Virtual platforms also provide the environment needed to apply the creativity of developers which can cost heavy expenditure and safety risks. Critical thinking on electronic platforms can collaborate with AI to explore and analyze new ideas in a fast and efficient manner.[4]

**Related Works**

**Critical thinking and AI in education**

During the pandemic times, online learning courses have amassed huge popularity among the students who are unable to go to specific destinations and are more comfortable continuing their education in the confines of their homes. Admissions to these courses have increased rapidly and caused headaches to the instructors. Therefore, AI was applied to reduce the pressure of teaching the big crowd of students from the instructor’s back.

A meticulous educator can easily understand and predict the behavior of students placed in their class and may try to solve any individual’s academic or disposition problems. AI techniques can assist the educator to detect these problems and the students suffering from them and need help as noted by Harry E. Pence(2019)[5]

**AIED**

Artificial intelligence in education can be seen in various instances. Any virtual intelligence used to promote education is categorized under AIED and it is still in the experimentation stage where we are observing how much potential will it have in this Industry. so far, it has proved to be quite useful.

AI can serve as several different forms of roles, i.e., as an intelligent tutor, tutee, learning tool, or policy-making advisor” (2020)[2].

Jen Hwang, Haoran Xie, Benjamin W. Wah, Dragan Gašević(2020)

AI	It's roles	categorizations
	Intelligent tutor	1. it provides tutoring processes online and can give real-time feedback. It also provides a personalized environment and Generates reports on students' assignments. Example: cognitive tutors
	Intelligent tutee	2. It can train and learn through interacting with the students and can provide answers after completing its training process. Example:-chatbot
	Intelligent learning tool	3. This device can help collect and arrange data to highlight critical points and help them find valuable implications underlying the data. Ex-mapping tools
	Policy-making advisor	4. with the help of AI technologies, policy makes get a better understanding about the Education settings.

Many funds are being incorporated into the development of AI but are the case same for critical

thinking and HI? No, for example, in the united states the sources for the AI industry's capital structure are growing day by day to compete and outrace other countries but funds for primary and higher education have deteriorated since the 1980s. instead, the education organization has become businesses for some people leading to the unavailability of higher studies for poor students. Progress of Critical thinking skills of students is a necessary condition for the future generation's capability to adapt to specific situations that may arise because of failures or errors and that machines wouldn't be able to handle. only in cases of disasters and emergencies, do the true abilities of individuals shine through. And that is what Artificial intelligence will never be able to impersonate as humans survive through these because of their flexible thinking.

Critical thinking skills can be established in the students by giving them assignments and ample opportunities to practice their already learned principles and apply their own judgment while figuring out the answers. Professors and educators are not only required to encourage the application of critical thinking skills of their students in their student life but they must also motivate the students to practice these skills in the future in all aspects of a real-life scenario.[6]

### **AI Enhances Critical Thinking in the Nursing Process**

A nurse must complete all the stages of critical thinking processes which are applicable in the nursing industry which comprises data collection, detailed examination, and evaluation of the data, deducing responses of the patients, reaching conclusions, taking the appropriate actions, and lastly assessing the effectivity of their actions. with the help of AI and the critical thinking skills of humans, the path of the nursing processes can reach new heights of accuracy and efficiency. analyzing, synthesizing, examining and generation of results can easily be broken down and simplified as mandated by HIMSS"(2019)[7]. AI Assistants can make decisions that decompose data into a simple form before doing logical operations on it to obtain results. These decisions can be reviewed to obtain the most profit-inducing decision.

From the aspect of training constraints, AI is stimulating the transformation of the proceedings containing the capability a person to evaluate, develop and compare variables.[9] AI is not only the instruments and machines like monitors and other

devices but there is also a virtual system that assists the trainees to deal with any problem which may occur either with the patient's health or the machines themselves and give them a chance to apply their thinking skills then and there in a safe environment which is not possible in real-life applications.

### **Discussions**

In this study, we have learned that people need critical thinking skills to have control over AI machines as they are maturing day by day and one day can overcome us and we can already feel and have become aware of its impact, especially on the sector of education where it has started taking the spot of the instructors. While it has not successfully covered most of the areas of learning, it is slowly gaining a foothold and thriving on the advantage of studying from home restrictions. But AI also has numerous advantages as we also have studied earlier and it proved its worth even in its early developmental stages. We cannot simply discard it on the basis of the fear of unemployment and also have to consider that it has saved many lives in the healthcare department, retained many future lives which could have been lost without the assistance of AI in their training, and many conveniences and fast deliverance provided by the AI, etc. For evenly distribution of the mixture of AI and critical thinking, in the workplace and in educational institutions, work that AI has trouble replicating, has to be given to the human employees.

With this in consideration, educational institutions have to focus on other parts apart from academics, mainly, social skills and advanced intellectual abilities like critical thinking skills to achieve a balanced and meaningful education. Additionally, employers look for critical thinking skills in employees as they know how to react in adverse situations and overcome them to produce benefits to the organization.[10]

Though AI is still a relatively new concept as compared to several other inventions such as machines, and electricity, it has still steadily enveloped the globe and made our lives very comfortable, and opened a whole new world that our older generations couldn't even have imagined of. Along with various other regulations, many governments from many parts of the planet have made guidelines, plans, and policies to help AI adjust and integrate better with the society of their own countries. They have taken administrative and strategical steps to nurture AI and also tried to

encourage the workers to specialize and take command over AI in their own ways to make their countries, the leading countries of AI.

The aim of AI implementation and approaches vary from one country to another country and depends upon political and developmental factors. Eg: countries like France and the UK are concentrating on becoming AI destination nations and their objectives form around topics like developing and selecting skilled people and building appropriate infrastructure. competitive countries that have rapidly achieved great profit economically and continue to implement AI to incur more income and are successfully lessening the distance between their goals like South Korea, Singapore, Japan, China etc are more oriented to manufacture AI products and expand their trading globally. Finally, the nations that can provide cheap labor for the working industry in AI technology like Malaysia, Mexico, and India have set their goals for AI-oriented job employment.[10]

### Conclusion

Throughout the study, we have surveyed information on the implementations of AI, its conveniences, its growth, and also its threats. We have particularly scrutinized and investigated its dangers in the education and job industries, and how it has already started affecting those sectors. we have also discussed how to conquer these challenges by focusing on the improvement of critical thinking skills in places where learning takes place such as schools, colleges, training centers, and other institutions. only by merging both AI and the thinking abilities of humans, will we be able to make use of the unrealized prospects and wealth they have in store.

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