CHAPTER II

LITERATURE REVIEW

This chapter discusses the definition of artificial intelligence and the definition of ChatGPT.

2.1 Definition of Artificial Intelligence

According to Coppin, Artificial Intelligence is the machine's ability to adapt to new situations, deal with emerging situations, solve problems, answer questions, make plans, and do other functions that require some level of intelligence normally seen in humans (Chen et al., 2020).

Already, machines made by humans are capable of performing a wide range of labor-intensive tasks. However, humans have attempted to imbue human intelligence into machines several times, driven by desires for greater productivity and possibly simply out of curiosity (Jiang et al., 2022). This represents the fundamental motive for artificial intelligence (AI). In terms of theoretical investigation and practical applications, AI research has achieved tremendous advancements during the past 65 years. According to Jiang et al., (2022), the usage of artificial intelligence is widespread and is seen as a crucial ability for the future. The market for artificial intelligence is anticipated to reach $190 billion by 2025, growing at a CAGR of more than 36% between 2018 and 2025.

The term "AI" is now widely used in practically every aspect of our life. The Web of Science search results are used to construct the semantic network graph, which is then visualized using the VOS Viewer program. It displays the relationships between and impact levels of the most relevant AI-related terms. The color of the links indicates how much emphasis has been given to the "application" of AI in the literature. While "neural networks," "classification," and "prediction" are the primary algorithmic emphasis, the notion is strongly tied to "system" sciences. Systems and engineering, brain science, psychology, cognitive science, mathematics, computer science, and many more fields are among the research fields of AI (Kaynak, 2021).

2.1.1 The Four Types of AI

According to (Schroer, 2023), AI can be divided into four categories. They are Reactive machines, Limited memory, Theory of mind, and Self-awareness.

1. Reactive Machines

A reactive computer can only use its intelligence to observe and respond to the environment in front of it, operates on the most basic AI principles. A reactive machine can not make judgments based on past experiences since it does not have memory. Because they can only view the environment instantly, reactive robots are only able to do a limited number of extremely specialized activities. Nevertheless, there are benefits to purposefully restricting the reactive machine's perspective: this type of AI will be more reliable and trustworthy, reacting consistently to the same inputs in the same way. Reactive machine examples:

- IBM's Deep Blue supercomputer from the 1990s beat renowned expert Gary Kasparov in a chess match. All that Deep Blue could do was identify the chess pieces on a board, understand their motions in accordance with the game's rules, detect each piece's present position, and determine which move would be the most sensible at that particular time. The computer wasn't trying to figure out how to arrange its pieces more strategically or predict the other player's next move. Every turn was seen as having its own reality and existing apart from any preceding motions.
- Similarly, Google's AlphaGo relies on its neural network to analyze changes in the game, but it is not capable of predicting future moves.

2. Limited Memory

Limited memory for obtaining data and evaluating alternatives AI is able to recall past data and predictions, essentially going back in time to find potential future developments. AI with limited memory is more complicated and has greater promise than reactive robots. limited memory AI is created when a team continuously trains a model to comprehend and apply new data, or it is created in an environment where models can be automatically trained and updated.

Six steps need to be taken when using restricted memory AI in machine learning:
- Create training information.
- Make the model for machine learning.
- Ascertain the predictive capacity of the model.
- Make sure the model is able to get input from people or the surroundings.

- Save comments from people and the environment as data.
- Repeat the previous stages in a cycle.

3. Theory of Mind

A theory of mind is purely theoretical. The scientific have not made technical progress necessary to create this sophisticated level of AI. The concept is based on the psychological understanding that other living things' thoughts and feelings have an impact on an individual's behavior. This would suggest that AI systems would be able to comprehend the emotions and decision-making processes of humans, animals, and other machines through reflection and willpower, and then utilize that understanding to make decisions of their own. To enable two-way communication between people and robots, computers would essentially need to be able to comprehend and interpret concepts such as the "mind," changes in emotions during decision-making, and a host of other psychological ideas in real time.

4. Self Awareness

After the theory of mind is developed, which is likely to take a very long time, the ultimate stage of AI development will be for it to become self-aware. Similar to humans, this type of AI is conscious and aware of its own existence as well as the presence and emotional states of others. It would have the ability to understand what other people could need by listening to what they have to say and how they express it. The development of AI self-awareness hinges on human researchers' ability to understand the fundamentals of consciousness and then devise a method for replicating them in computers.

2.1.2 Artificial Intelligence Examples

According to Bose (2017) an enhanced electric power system of the future that incorporates cutting-edge power electronics, computers, information, communication, and cyber technologies is known as an intelligent grid or a smart grid. Chatbots, navigation apps, and wearable fitness trackers are just a few examples of the various applications of artificial intelligence technology. The examples below show the range of possible uses for AI.

1. Chat GPT

   ChatGPT is an AI chatbot that can write text in many different formats, such as code, essays, and simple question and answer sets. Launched in November 2022, ChatGPT by OpenAI is equipped with a large language model that allows it to mimic human writing rather accurately.

2. Smart Assistant

   Natural language processing, or NLP, allows personal assistants to understand user commands to make reminders, look up information online, and adjust users' home lighting. Many times, these assistants are made to adapt to the preferences of the user over time, giving them better ideas and more personalized replies.

3. Wearables

   Wearable sensors and devices in the healthcare industry also use deep learning to assess a patient's general health, including their blood pressure, heart rate, and blood sugar levels. Additionally, they may spot patterns in a patient's past medical records and use those to forecast any possible health problems in the future.

2.1.3 Artificial Intelligence Benefits in Education

A crucial piece of technology that supports both daily living and commercial activity is artificial intelligence (AI). It solves several issues and makes a significant contribution to the global economy's sustainable growth. AI has gained attention recently as a means of fostering growth in industrialized nations, such as those in Asia, Europe, and America (Lu et al., 2018).

1. Personalized Learning

   Students react differently to new knowledge in different ways. Some individuals pick things up fast, while others take longer. The conventional educational system does not incorporate the concept of individualized learning for every student. Artificial intelligence in online education might be useful in this situation. Customized educational software for every student is ensured by the usage of AI in the education sector. Furthermore, the system adapts to the way the student uses auxiliary

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technologies, such as machine learning, in the classroom to understand different lessons, reducing effort.

2. Task Automation

The majority of value-added jobs are now handled by technology thanks to AI in school education and virtual classrooms. AI solutions for education can deliver presentations and take notes, check homework, grade tests, arrange research papers, and manage other administrative activities in addition to customizing the teaching process. For this reason, organizations rely on incorporating AI technology into their operations to accomplish everyday objectives. AI improves learning environments by automating routine tasks, increasing knowledge and efficiency.

3. Adaptable Acces

Users may now make use of AI's benefits in education thanks to comprehensive access to information. According to a recent poll, more than 60% of education-related firms rely on the creation of AI/ML-based educational apps that are backed by contemporary features and capabilities. The convenience of teaching and learning in different languages is made possible by features like multilingual assistance. AI is also essential for educating audiences that are blind or deaf. Online lectures can include subtitles that are updated in real time thanks to AI-powered converter tools like Presentation Translator.

4. Determining Classroom Vulnerabilities

One of the most powerful uses of artificial intelligence in education is remote learning, which helps us maintain a positive environmental impact. However, many experts believe that in the long run, AI will replace human interaction in education. This might not apply to the school sector, but it does to other businesses. AI and education go hand in hand, improving both on-campus and conventional training. AI only helps the experts by enhancing the human teaching and learning process.

5. AI in Examinations

In tests and interviews, AI software systems may be actively used to help detect suspicious behavior and alert the supervisor. Through cameras, microphones, and web

browsers, the AI systems keep an eye on every individual. Additionally, they examine keystrokes and notify the system of any movement. Artificial intelligence (AI)-based apps and software may be useful in more ways than one may imagine. As a result, enterprises and EdTech organizations are lured to AI technology solutions that effectively resolve a wide range of customer issues. As a result, if you are employed in the professional education sector, you must immediately implement AI solutions in your business.

2.2 Definition of ChatGPT

According to Kyle Lam (2023), Artificial intelligence (AI)-based ChatGPT was taught using data from the internet that was authored by humans, including discussions. This AI-powered chatbot can write essays, and poems, solve coding problems, and explain difficult ideas, among many other things.

Furthermore, an artificial intelligence (AI) neural network underlies ChatGPT, a chatbot created to assist consumers through instant messaging. When questions are supplied as input, chatGPT complies with the vast number of data and statistics before attempting to compile pertinent texts and return answers (Pourhoseingholi, 2023).

An advanced language model called ChatGPT was developed by modifying OpenAI's Generative Pretrained Transformer (GPT) language model. Producing text that is almost identical to written material is its aim. It might speak to customers in a way that is surprisingly easy to understand.

2.2.1 The use of ChatGPT in Education

According to Mhlanga (2023) Artificial intelligence has advanced significantly in recent years, which has sparked the creation of ground-breaking technologies like Open AI's ChatGPT. Modern technology like the ChatGPT language model has the potential to revolutionize the educational landscape. As ChatGPT is increasingly widely used in educational settings, it must be done so while adhering to ethical and responsible norms. ChatGPT is currently the most sophisticated chatbot ever made.

In addition, it has generated a lot of hype and doomsday predictions regarding student evaluation in higher education in addition to a number of other issues. Unlike previous chatbots, it can write outstanding writing in a matter of seconds (B & C, 2023).

Students continue to respect credentials highly, even if educational institutions have a monopoly on them. These qualifications cover both research and other types of educational activities, as well as how students are taught. Though there has long been a tendency to see technology as a magic bullet, expectations for dramatic innovation in education are sometimes overblown. This is because it came out that students still place a high value on credentials. Having stated that, ChatGPT's capacity to comprehend and react to human language has demonstrated to be a very useful tool for educators, learners, and other types of learners. However, as ChatGPT is being used in educational settings more and more, its use needs to be limited by moral and responsible guidelines. In addition to guaranteeing technical accuracy, a responsible and ethical application of artificial intelligence in education means considering the ethical and social implications that may arise from its use, including concerns about bias and individual privacy, as well as how AI will shape education in the future.

The Procedure of using ChatGPT

With the presence of ChatGPT in generating various ideas and writing things in a structured and good way. The steps to use ChatGPT.

1. Open a browser on your phone or PC.

2. Visit any page that has ChatGPT, such as https://chat.openai.com.

3. Create an account with the Sign Up menu and then Create an OpenAI account using an email, Microsoft, or Google account.

4. OpenAI will provide a verification code and will be directly redirected to the platform dashboard.

5. Enter the desired command, and a few seconds later AI will provide an answer.

2.2.2 Advantages of ChatGPT Usability in Education

The ethical and effective use of ChatGPT in educational situations is a complex and multidimensional problem that requires a sophisticated, interdisciplinary approach. The necessity of using artificial intelligence in education in a responsible and moral manner has been brought to light by a recent research. Priorities such as privacy, discrimination, and

whether AI might increase the digital gap have been the focus of this topic's study (Garrett et al., 2020).

1. Write an Essay

   Due to the high demand generated by ChatGPT's sophisticated features, the AI tool amassed over 100 million users in just two months after its release. One of its most notable qualities has been its capacity to quickly and easily create various types of literature, such as songs, poetry, bedtime stories, and essays.

2. Time Saving

   To start ChatGPT, only a prompt is required. When students tell ChatGPT what they need from it, it quickly does all the labor-intensive tasks. ChatGPT can provide students with the answers more quickly than they could on their own, whether students require essay topic ideas, a list of synonyms for a specific term, or a brief synopsis of anything they read. ChatGPT is fantastic for saving students' time, especially when it comes to brainstorming. The days of looking blankly at a Google Doc are over since AI is now available to assist students in overcoming that annoying writer's block.

3. Learning and Improvement

   Spend some time each time students utilize ChatGPT to understand the content it has produced in connection to your prompt.

   Examples of appropriate questions to consider while evaluating ChatGPT's results are as follows:

   - How did it arrive at this judgment? How can I use that methodology in my work?
   - Is this response what I anticipated, or am I surprised? Why?
   - Will this help me write better? How so?
   - What can I learn from this situation? How will it influence the way I write in the future?
   - You have the chance to learn something new each time you utilize ChatGPT. Instead of relying on AI for everything, we should learn how to use technology to better ourselves.