

CHAPTER II

THEORETICAL REVIEW

This chapter will discuss existing theories and viewpoints for current research. The theoretical review will discuss theories and research that are relevant to the topic, so that the author can conduct this research.

A. Artificial Intelligence

Artificial intelligence technology has developed rapidly along with the advancement of science and technology around the world. With continuous development, artificial intelligence technology is widely used in various fields. It is an indisputable fact that AI is increasingly penetrating the world of education and is becoming more important to people who see how important this technology is for education (Huang, 2021). AI has been used extensively in the field of education and has shown many benefits in its various applications, which have a great impact on improving student learning and creativity.

AI has been widely used in education since the advancement of computing and information-processing techniques. AI in education focuses on real-world trials and the development of standardized modular prototypes in reasoning, data visualization, and learning analytics to make major advances in educational techniques (Limna, Siripattanakul, Kaewpuang, & Sriboonruang, 2023). AI in education is to use and facilitate the learning process, such as understanding and facilitating computer-supported collaborative learning, or providing personalized guidance or learning support to each student based on their learning status, preferences, or personal

characteristics. Amazon, Facebook, Microsoft, Google, and others are some of the technologies that have used artificial intelligence (Fitria, 2021).

1. History of Artificial Intelligence

According to (Mikelsten, Teigens, & Skalfist, 2020) a group of scientists from the fields of mathematics, psychology, engineering, economics, and political science began debating the possibility of creating an artificial brain in the 1940s and 50s. In 1956, the research field of artificial intelligence was established as an academic.

The first studies on thinking machines were conducted in the late 1930s, 1940s, and early 1950s. According to this cutting-edge neurological research, the brain is an electrical network of neurons that emit in all-or-nothing pulses. Herbert Wiener, a cyberneticist, explained the control and stability of electrical networks. Claude Shannon's theory of information explained digital signals, which are all-or-nothing signals. Alan Turing's theory of computation showed that any kind of computation can be explained digitally. The close relationship between these ideas suggests that building an all-electronic brain is possible.

Walter Pitts and Warren McCulloch analyzed the Ideal Model neuron network and showed how they could perform simple logical functions. They were the first to describe what was later referred to as a neural network by researchers. Marvin Minsky, a 24-year-old graduate student, was one of the students inspired by Pitts and McCulloch. Minsky built the first neural network machine in 1951 with Dean

Edmonds. Over the next 50 years, he would become one of AI's greatest innovators and leaders.

B. ChatGPT

ChatGPT or Conversational Generative Pre-training Transformer can be an important tool in higher education to improve study skills as it can save time and improve the quality of student work by creating text, summaries, and outlines. It can also detect style errors or grammar, making written content easier to understand. In addition, ChatGPT can help students improve their research skills by providing information and resources related to a particular field, suggesting undiscovered elements, and incorporating them into a new research subject, allowing students to gain a better understanding and assessment of the subject. The way ChatGPT works can create human-like conversations, discussions, speed, efficiency, and cost-effectiveness as it does not require human labor (Halaweh, 2023).

ChatGPT is trained using millions of text documents available on the internet, be it books, articles, or online conversations, so that it can take the context of the given text and provide accurate answers and information (like human answers in a conversational context) according to the context of the question. These ChatGPT responses cover a wide range of topics and user commands. ChatGPT has this capability and is very useful in Natural Language Processing (NLP) applications (Kusumastuti, Trialdi, & Dyah, 2023). NLP is an area of artificial intelligence (AI) that aims to assist

computers in "understanding" and creating automated text, sentences, and conversations that can be read by humans.

Many people are surprised that ChatGPT's answers seem well-structured, have consistent relationships between words or sentences, and are quite accurate (Putra, Saputro, Hakim, Yayang, & Fuadin, 2023). They also can remember previous conversations. A scientific article or even a book can be created in a much shorter time than usual, even with proper aerial techniques. ChatGPT is available on various platforms, such as web, apps, and software.

1. History of ChatGPT

According to (Rachbini, Evi, & Suyanto, 2023), one of the artificial intelligence (AI) models developed by OpenAI is ChatGPT, which was first released in 2018 and continues to be developed until the latest version released in 2020. The model was created to perform tasks such as machine translation, sentiment analysis, and entity recognition in natural language processing. Rapid development has made this model usable in various applications, such as automatic writers, and chatbots.

ChatGPT has undergone many changes throughout its history. In 2019, OpenAI released the more advanced ChatGPT-2 model, which can create more realistic and stunning text. In 2020, OpenAI released the more powerful ChatGPT-3 model, which has better natural language processing capabilities, including the ability to answer questions, write essays, and perform other natural language processing tasks.

ChatGPT is increasingly used in various applications, such as chatbots, and virtual assistants. OpenAI is updating ChatGPT to improve its capabilities and provide better natural language processing solutions.

2. Usefulness of ChatGPT

The types of tasks that can be completed by ChatGPT include answering general questions, paraphrasing or text reformulation, assisting in writing, language translation, creating summaries, idea generation and brainstorming, text editing and correction, virtual assistant, training and education, creativity and entertainment (Rachbini, Evi, & Suyanto, 2023).

1. Answering general questions: ChatGPT can be used to answer questions related to facts, history, science, and other general matters.
2. Paraphrasing or text reformulation: ChatGPT users can use ChatGPT to request sentences or paragraphs to be changed but retain their original meaning.
3. Assist in writing: ChatGPT can help users write articles, short stories, or other content by providing ideas, suggestions, or even writing text according to user commands.
4. Language translation: ChatGPT can help translate text from one language to another quite well, although it is not an expert language translator.
5. Creating summaries: ChatGPT can be used to combine long texts into a simpler form without losing important information.

6. Idea generation and brainstorming: ChatGPT can help users generate new ideas or thoughts about different things or problems that users face.
7. Text editing and correction: ChatGPT can help users' correct grammar, spelling, and writing style errors in submitted texts, although the results may not be ideal.
8. Virtual assistant: ChatGPT can serve as a virtual assistant to help users organize schedules, remind tasks, or even answer questions about the latest news and weather.
9. Training and Education: ChatGPT can be used as a tool to explain concepts, provide examples, or aid understanding of various academic subjects.
10. Creativity and entertainment: users can create poems, song lyrics, puzzles, or other entertainment content by using ChatGPT.

3. Limitation of ChatGPT

ChatGPT is an advanced platform, but it has its limitations. Some of the limitations include limited knowledge, factual errors, inconsistencies, and inability to think critically (Rachbini, Evi, & Suyanto, 2023).

1. Limited Knowledge

ChatGPT has limited information until September 2021. As a result, the model may lack recent data or be unable to answer questions about new events that occur after that date.

2. Factual Errors

It is important to always verify the information provided by the model with reliable sources as ChatGPT may produce answers that are less precise or contain errors of fact.

3. Inconsistencies

Since this model cannot think critically and cannot differentiate between facts and opinions, as a ChatGPT user we should be careful when relying on the answers provided, especially if our questions involve interpretations or opinions.

4. Inability to Think Critically

ChatGPT can sometimes give different or conflicting answers depending on the way ChatGPT users ask questions. To ensure we get consistent answers, we as users should try asking questions in multiple ways.

C. Academic Integrity

People see academic integrity as a major challenge in education. Academic misconduct continues to increase year after year. Academic problems such as cheating during tests or exams and copying friends' homework are also considered academic offenses. Academic integrity is an attitude and behavior based on values such as honesty, trustworthiness, fairness, respect, responsibility, and courage that are by the religious and cultural teachings of a student and academic in various academic contexts and practices. Dishonesty in the academic world will stem from low academic integrity.

Plagiarism (use unauthorized assistance in an examination by using someone else's original language, concepts, information, or materials without acknowledging all sources) and data falsification are examples of academic dishonesty.

Academic integrity is based on six principles: honesty, trust, fairness, respect, responsibility, and courage.

1. Honesty

In academic integrity, honesty means conveying information correctly and adhering to applicable writing rules, such as citing sources. In addition, academic integrity is honesty-being and behaving honestly in all matters and being able to present oneself as one is. In terms of academic integrity, an honest person does not commit fraud such as plagiarism, cheating, sharing exam answers, copying writings without mentioning the source, asking others to do their work, or buying exam answers.

2. Trust

Students demonstrate trust when they believe they are right. Confidence will encourage and support free communication and a sense of optimism and belief that students can improve. Students' trust is built through experience and built by actions, such as actively participating in class and obeying the rules. Teachers also shape students' trust by showing a positive attitude towards students and responding clearly to students' work.

3. Fairness

Fair behavior is essential in academia. The main components of fairness are predictability, transparency, and clear and reasonable expectations. Fairness in academic integrity means behaving fairly according to the rules in place to create good standards and clear protocols for academic activities.

4. Respect

In an academic environment, respect is reciprocal and requires respect for oneself and others. Respecting oneself means facing challenges honestly. Respecting others means appreciating the need to compete and refine ideas. By valuing and utilizing opportunities to acquire new knowledge, actively participating in discussions, listening from others' perspectives, and performing to the best of their abilities, students demonstrate respect.

5. Responsible

A responsible academic environment can eliminate apathy and inspire others to uphold fair academic standards. Being responsible means refraining from classmate pressure, not making mistakes, and setting a good example. Responsible students believe they are responsible for their choices and strive to avoid the mistakes of others. Learning to recognize and stop the urge to behave immorally is known as cultivating responsibility. Courage is required to maintain the value of responsibility.

6. Courage

Courage is a character trait that allows students to commit to their education by maintaining the highest academic integrity by standing up for themselves and fellow students even when it means risk or negative consequences. Being courageous means following what one believes. Courage, like intelligence, can only develop in challenging situations. In an academic environment, students must not only learn to make reasonable decisions but must also demonstrate the courage to follow their decisions with action. Courage is the only way to build and maintain the integrity necessary to remain a responsible, honorable, reliable, fair, and honest person in any situation encountered.

D. Learning Behavior

Education in secondary schools, both junior and senior secondary, is very different from education in higher education. Students are required to actively participate in learning activities in higher education. Students are required to search and study course materials independently without waiting for instructions from lecturers. This includes asking questions when they don't understand the material taught, taking notes on important topics taught, using learning resources available in the library, and others (Nurhasanah & Suci, 2019).

According to (Asrori, 2020), Learning behavior is the way students understand and respond to learning activities. It shows whether they are active and responsible for the lesson. In terms of learning behavior, there are

two judgments: good or bad, depending on the person who sees it, or even indifferent. The way students learn is also called learning behavior. Thus, it can be concluded that learning behavior is a way or action that contains an attitude towards the application of certain learning policies by individuals or anyone in certain situations and times.

1. Manifestations of learning behavior

The concept and definition of learning behavior varies depending on the person viewing it, as each person has a unique learning behavior. In Asrori's book there are several manifestations of learning behavior often see the following changes usually appear:

a. Behavior

Every student who has experienced the learning process will experience changes in behavior. This behavior comes from the process of responding to repeated stimuli; it is also a reduction in behaviors that are not needed because this reduction process makes the behavior a new behavior. According to Witherington in Andi Mappiare, behavior is a way of learning that stays with students when receiving lessons, reading books, doing assignments, and completing learning activities. Learning behavior can be defined as a way of learning that is continuous, uniform, and fairly automatic.

b. Skill

According to Asrori's book, skills are behaviors that are learned through stages of learning. Rough or uncoordinated movements come from exercise.

The irregular movements then change into smoother movements through the coordination process of discrimination (difference) and integration (fusion). This is done to gain the necessary abilities for a specific purpose.

c. Associative Thinking

In Asrori's book, it is said that associative thinking is a way of thinking in which previous ideas provoke new ideas. Ideas come freely because the path of thought is not predetermined or directed. The level of understanding or knowledge that students gain from learning results greatly affects their ability to make correct associative relationships. However, memory is a form of learning as it is an essential component in associative thinking. Therefore, students who have experienced the learning process will be indicated by an increase in the store of knowledge and understanding in their memory, as well as an increase in their ability to relate the material to the situation or stimulus they face.

d. Critical Thinking

Critical thinking means considering several things that help make a decision. Therefore, it must be done careful thought. Learning behavior especially in solving problems is demonstrated by critical

thinking. Students who think critically usually answer questions using basic understanding. Students are required to use logic in critical thinking to determine cause and effect, analyze, draw conclusions, and even create laws (theoretical methods).

2. Types of Learning Behavior

Learning behavior is divided into two, namely good learning behavior and bad learning behavior. Student learning behavior includes:

a. Behavior during lectures

Good student learning behavior is to take notes on lecture material (Nuryatin & Mulyati, 2021). It can be understood that note-taking is an important part of lectures because, what is explained by the lecturer is the core of the exam material. Taking notes is the best option for students from middle to lower-class families who have difficulty getting books. In addition, students behave well when looking at lecture materials and stay focused, and they also often ask questions if they do not understand.

b. Learning behavior in repeating lessons

Lecturer explanations received by students are sometimes or even often unclear. This is because students still have vague memories of the material or lessons learned during the learning process. Therefore, repetition or stabilization is needed from students to clarify these vague memories (Uran, Kase, & Adinuhgra, 2021). Basically, things like this are meant to be easier to understand.

c. Book Reading Habits

The learning process is inseparable from books; therefore, good student behavior about books includes owning books and reading them as a source of knowledge; books should be read, written, crossed out, plastered with articles, and "dialogued with" so that they become part of themselves.

d. Study behavior during exams.

Students usually do not experience difficulties when facing exams or tests if they have prepared well and studied as much as possible. Exam preparation is students' efforts to organize and carry out their learning activities so that they can understand the subject matter they have received (Sutomo, 2019). It will be easier to prepare by knowing the type of exam that will be faced. The more knowledge we gain, the greater the value we will get. The main purpose of exams is to measure the learning process, the ability to organize the collection of information, and the knowledge of the topics that have been studied.

e. Learning behavior in visiting the library

Visiting the library means a habit of borrowing books, a high frequency of visits, and a habit of reading books in the library. However, whether it is required by the lecturer or because it is done voluntarily, the behavior of visiting the library can move students (Darmawan, 2016). Students who are eager to acquire knowledge will visit the library and make full use of it.

The library is not only built to borrow books, but also to be a place where students do assignments and study. Students will gain more knowledge if they visit and utilize the library more often.

3. Characteristics of Learning Behavior

According to (Asrori, 2020) learning behavior has some characteristics including intentional change, Positive and active changes, effective and functional changes.

a. Intentional change

Changes that occur during the learning process are caused by experiences or practices that are carried out intentionally and consciously. This characteristic means that students realize that they are experiencing changes or at least feel that they are experiencing changes. These changes can include increased knowledge, habits, attitudes, and perspectives on something and new skills.

b. Positive and active changes

Changes that occur during the learning process are positive and active. Positive change means that the change is always incremental, that is acquiring new things, such as new understandings and skills that are better than before. Active change also means that the change is always incremental, meaning that they gain something new.

c. Effective and functional changes

Changes that occur during the learning process are effective, which means that they have a certain impact, meaning, and benefit to those

learning. Functional changes also mean that they are relatively stable and can be reduced and utilized whenever necessary. It is expected that there will be many benefits from functional changes.

E. Previous Studies

The first article written by Aiman Faiz¹ in 2023 states that, the advancement of artificial intelligence technologies such as ChatGPT has brought new developments to today's technological world, particularly in terms of the use of technology in the field of education. With the potential offered by ChatGPT, as educators, they will face greater challenges in carrying out the educational process. It is also very important for students to maintain ethical and moral values along with academic values when using ChatGPT to ensure that students as users can weigh the benefits and effects when relying on unfiltered technology in science.

The second article was written by Alejandro Guadalupe Rincon Castillo in 2023 wrote that, by using chatbots such as OpenAI and ChatGPT models, which provide instant and immediate responses to questions. ChatGPT is changing the learning process of college students as many students find it easy to complete assignments by using it at no cost. This is because ChatGPT generates a larger number of words in seconds, making many students put off completing their final assignment by using AI

The third article is written by Mhlanga in 2023 state, the use of Open AI and ChatGPT in education in the future these latest technologies have the potential to transform the education industry as a whole by improving student

learning, providing individualized instruction, and automating administrative tasks. Open AI and ChatGPT can help students have a more customized learning experience by assessing their learning tendencies and providing content and feedback tailored to them. The integration of AI in education should be led with ethical, social, and practical issues in mind, so that each student can receive a more individualized, effective, and efficient education.

The difference between my research and previous research is that my research focuses on the use of ChatGPT on students' English learning behavior while previous research discusses learning behavior in general.