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Teaching Program Based on (ChatGPT) and Its Effectiveness in Developing Reading Comprehension Skills for English Language Students at University

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Abstract

The current study aimed at building a teaching program based on (ChatGPT) to develop reading comprehension skills and evaluate its effectiveness in developing reading comprehension skills among undergraduate English language students at university. The study applied the descriptive analytical approach by building a list of reading comprehension skills in the English language (a questionnaire) designed for this purpose, and used the experimental method with a semi-experimental design by using (a pre- and post-reading comprehension skills test). The study's sample consisted of (60) female students divided into two groups: a control group consisting of (30) students and an experimental group consisting of (30) students. The study revealed the effectiveness of the ChatGPT-based teaching program in developing literal, deductive, aesthetic, creative, and critical comprehension skills among the students in the experimental group. The study recommended conducting training courses for faculty members and students on how to use (ChatGPT) and organizing workshops to raise awareness among faculty members about the importance of applying (ChatGPT) in teaching English language courses. Additionally, distribute informational brochures to both managers and supervisors to enhance the role of faculty members in utilizing other artificial intelligence applications.

1. INTRODUCTION

English language is one of the most important international languages in the current century as a medium for exchange of information and knowledge with others, and familiarity with foreign cultures, as it facilitates the process of communication, cooperation, sharing and understanding between all races, genders and cultures. In light of the explosion of knowledge, it began to spread significantly, especially with the emergence of the internet and artificial intelligence applications that are used in all fields of life (Haitham and Alarous, 2021). English language curricula are one of the curricula that contribute to the development of student's abilities and language skills and enable them to communicate with others to communicate with the latest achievements made by the world in various scientific and cognitive fields and apply contemporary modern technologies and benefit from them such as the World Wide Web "Internet", so attention must be paid to teaching it to students, by

preparing and training teachers and enabling them to design plans and lessons according to modern teaching standards. Such as the use of artificial intelligence applications that help focus and interact with students (Zaki, 2022).

With the technical and cognitive development, modern and contemporary applications have emerged such as artificial intelligence applications, and have a prominent role in developing the capabilities of learners in various fields, such as developing reading comprehension skills in the English language and addressing the weakness of learners and their low levels in reaching the ultimate goal of the reading process, which is to realize and absorb the ideas and meanings contained in reading texts, translate them and avoid falling into linguistic errors, and this is indicated by the study of Jr , Generale and Sakthi (2023).

Artificial intelligence applications are one of the outputs of the Fourth Industrial Revolution, which constitutes a simulation of human intelligence, such as learning, thinking, and interacting with those around them, by designing a huge number of applications on the Internet and smartphones, which are widely exploited, such as robots, machine learning forms, machine translation, language processing and teaching applications, cognitive simulation programs, deep learning in problem-solving, voice knowledge, health and energy, and the extent of its prominent impact on human life in helping them to solve the problems facing them and make appropriate decisions logically (Zaki, 2022).

One of the most important applications of artificial intelligence that has a prominent position and multiple uses, including its use in language education, including English, is what is known as the artificial intelligence application ChatGPT - "robot chat", which was announced in November (2022) by the American company OpenAI; this application has its capabilities to collect information from several diverse sources, and also provide training to humans (Sakib, 2023).

ChatGPT application is one of the models of learning artificial natural language, being an artificial language application trained in the English language, and provides deep machine learning technology and neural networks that are based on training for very large texts, learning them through processing, and is also used in generating, translating and correcting texts, and creating automated conversations in an advanced manner, by applying it as a main model to reach solutions to several different problems in the field of natural language (Božic, 2023).

The problem of the current study emerged in response to many recommendations of conferences and seminars, and the directions of the Ministry of Education in the Kingdom of Saudi Arabia, which is interested in developing students' skills in the English language, and stresses the importance of conducting more studies and research in the field of artificial intelligence applications (ChatGPT application), to achieve the goals of 2030 Vision, and the Artificial Intelligence Conference in Jordan (AIDTSEC), which was launched in September 2023, recommended the importance of technological updates in all fields, including the field of education came to emphasize the importance of using smart applications in education at all levels, especially universities.

However, learning English as a foreign language requires full mastery of English language skills and understanding, most notably: reading comprehension skills, as these skills

face great weakness and shortcomings, as the study by Al-Farani and Al-Asmari (2021), Al-Qurashi and Altaf (2022), and Irshid (2022) indicate one of the reasons for the low understanding of the English language and its weakness in learners is due to the usual methods adopted by teachers and the lack of involvement of students in education, and thus reduces their ability to comprehend reading, language and speaking skills.

Zaki's study (2022), found that smart teaching systems improve educational outcomes for teaching students foreign languages when used alone or combined with traditional education, and the study of Ali, Shamsan, Hezam and Muhammed (2023) showed that GPT motivates learners to develop their skills in reading, writing, listening, and speaking. The results of the study of Tlili et al. (2023) revealed that GPT is a powerful tool in education, but users should be careful when using it.

In this study, the teaching program based on ChatGPT was chosen as a result of the lack of studies and references that combined the application of (GPT) and reading comprehension for English language students in universities, and this study came to bridge the gap between the two variables, and also because of the importance of the teaching program based on ChatGPT in developing reading comprehension skills among English language students at the undergraduate level, and the suitability of this application with contemporary teaching methods. This study sought to build a "ChatGPT-based teaching program and measure its effectiveness in developing reading comprehension skills among undergraduate English language students."

The present study seeks to answer the following main question:

"What is the ChatGPT-based teaching program and its effectiveness in developing reading comprehension skills among undergraduate English language students?" The main question was divided into the following sub-questions:

1. What English reading comprehension skills are needed for undergraduate students?
2. What is the effectiveness of the ChatGPT-based program in developing literal comprehension skills among undergraduate English language students?
3. What is the effectiveness of the ChatGPT-based program in developing critical comprehension skills among undergraduate English language students?
4. What is the effectiveness of the ChatGPT-based program in developing aesthetic comprehension skills among undergraduate English language students?
5. What is the effectiveness of the ChatGPT-based program in developing creative comprehension skills among undergraduate English language students?
6. What is the effectiveness of the ChatGPT-based program in developing deductive comprehension skills among undergraduate English language students?

2. LITERATURE REVIEW

2.1. Reading Comprehension Skills in the English language

Improving reading skills is one of the most important goals of the curriculum, and the most important of language skills at all educational levels (Sadiku, 2015, p. 30), as it is a complex and purposeful social, cultural, cognitive and linguistic process in which readers use their knowledge of spoken and written language, their knowledge of the subject of the text, and their knowledge of their culture to construct meaning in the text at the same time (Aquino & Vera, 2018, p. 24).

Liu, Chen and Liu (2022, p.1&2) explain that the quest to prepare and refine a good reader is to make him more understanding of what is included in the written material, no matter how difficult it is, and that the main goal of training the student so that he possesses a visual vocabulary and acquires skill in word recognition and to develop his verbal ability, in general, is to be able to correctly understand the meanings of those written symbols as the level of his skill in reading depends mainly on the extent of His understanding of these meanings and his accuracy in interpreting them, as reading requires students to be able to integrate textual information and apply it with prior knowledge while evaluating and reflecting on the accuracy of arguments in the information conveyed by the text.

Ardiyan, Rosyid & Priyantin, (2022, p. 101) asserts that comprehension is the basis of the reading process and its cornerstone, and comprehension comes in the first place for learning to read, so reading does not occur without understanding, by watching symbols, illustrations or printed discussions and proper understanding of the printed text makes the reader more interactive with the printed material and the reader is able to extract new information and combine it with his previous experiences and reach new meanings.

2.2. Importance of Reading Comprehension Skills in the English Language

Bashir (2019, p. 73) indicates that reading comprehension skills are important in being the main pillar through which the student proceeds to understand and comprehend English language topics and other subjects and reduce students' errors in reading, and reading comprehension skills allow the student the ability to perceive information and knowledge and learn about other cultures, in addition to developing the student's thinking processes, which will reflect on his life in the future and be able to solve problems, and that the learning resulting from comprehension establishes In the minds of students more than learning through memorization and thus building a background of knowledge through which they can face the flood of information resulting from the explosion of knowledge at present.

2.3. Classification Levels of Reading Comprehension Skills

Many scholars have contributed to the classification of reading comprehension skills at graded levels, such as Callahan and Clark, who classified reading comprehension skills into three levels (Imam, 2016, p. 178):

1. Reading what is on the lines: It is considered the basis of understanding and is the verbal understanding of words, sentences and structures.

2. Reading between the lines: It aims to search for evidence, make judgments, and clarify the results.

3. Reading beyond the lines: It is the ability to predict and derive generalizations and applications that are not mentioned by the writer.

Comprehension at the higher levels depends largely on the reader's success in understanding and comprehending the lower levels, and researchers have differed in classifying the reading comprehension skill in terms of the number of levels and their names, and despite this difference, there is a very large similarity between those classifications and the skills in their different levels, as they classified both (Mohidat and Al-Samadi, 2020), and (Al-Hawamdeh and Al-Balihed, 2016, p. 176), reading comprehension skills to five levels:

1. Literal level: At this level, less complex skills are resorted to (basic comprehension skills) that help in understanding the main ideas that the read text acquires, and this level refers to (reading lines). It includes understanding the true meanings of the words contained in the read text, knowing the idea he wants to convey (the general idea of the topic), knowing all the details of the text, identifying partial ideas, understanding all the directives and generalizations contained in it, and understanding the writer's organization of it.
2. Deductive level: Reading here does not need to understand the apparent meaning of the public only, but must understand the implicit meaning of it as well, the reader at this level should think more than the words and symbols themselves to derive new meanings aimed at interpreting the text read, and this level refers to (reading between the lines). This level includes (clarifying metaphorical vocabulary and knowing what you are seeking, concluding the information presented).
3. Organizational level: At this level, the reader must be more aware of the facts mentioned and have the ability to see the relationships between the materials and know the important ones and supporting details.
4. Critical level: This level must be the reader with the ability to make judgments and evaluations of the read text where the reader at this level is able to (discover the writer's point of view, expectation, conclusion and analysis, distinguish between truth and opinion, evaluate evidence and proofs, and apply the ideas acquired in reading) and this level refers to (reading behind the lines).
5. Creative level: It is the highest level of reading comprehension and at this level, the reader is able to (generate the largest possible amount of ideas, their diversity and uniqueness, and the ability to put an appropriate title for the read text).

2.4. Artificial Intelligence

Artificial intelligence began in (1901), and it is considered the most important result of the Fourth Industrial Revolution as a positive output that resulted from the pattern of the relationship between human intelligence and machine and constituted an inevitable necessity in industrialized countries to serve humanity, and developed countries have competed among themselves in using and employing its applications in all institutions, especially educational (Al-Wahsh and Shamis, 2020, p. 627). Majid (2018) points out that artificial intelligence applications have come to dominate all areas of life and their military, industrial, economic and technical fields, as well as medical, educational and service fields, which has brought about radical developments and transformations in human life, and artificial intelligence applications have become at present the basis for the progress and prosperity of societies through their use in new innovations that establish a new world.

2.5. History of Artificial Intelligence

A small group of scientists began in the fifties of the twentieth century to invent a new approach to the design and construction of intelligent machines through modern inventions and explorations in neuroscience, a new mathematical theory of information, and the development of cybernetics and above all, through the innovation of the digital computer, a machine has been invented that can simulate the process of human computational thinking, and the modern field of artificial intelligence research was established in (1956), at the conference on the campus of the College of "Dart Motte", and became the one who attended this conference Leaders of artificial intelligence research for several decades, especially (Marvin Lee Minsky, Herbert Simon, Allen Newell, Marvin lee Minsky, who founded artificial intelligence laboratories at the Massachusetts Institute of Technology, Carnegie Mellon University and

Stanford, and provided in cooperation with their students programs that dazzled humans, where the computer solved problems in algebra, proved logical theories, and spoke English, and these researches in the mid-sixties became heavily funded by the US Department of Defense, and these researchers predicted The following (Raqiq, 2015, p. 15):

1. (Herbert Simon): In (1965) "Within twenty years machines will be able to do whatever work a human can do."

2. (Marvin Lee Minsky): In (1967) "within a generation the problem of AI design will be largely solved," but in 1974 they failed to recognize the difficulty of many of the problems they faced, respond to negative criticisms of AI, and constantly lobby Congress to fund more productive projects, which led to the U.S. and British governments cutting off their funding for targeted exploratory research in AI, the first setback in AI research.

Anyoha (2017) points out that in the eighties, artificial intelligence was restarted again by two sources: the expansion of the algorithmic toolkit, and the increase in funding, as (John Hopfield) and (David Rumelhart) deployed "deep learning" technologies that allowed computers to learn using experience, on the other hand, (Edward Weigenbaum) introduced expert systems that simulate the decision-making process of the human expert, specialized systems were widely used in industries and the Japanese government-funded Specialized systems and other endeavors are largely related to artificial intelligence as part of the Fifth Generation Computer Project (FGCP). From (1982 to 1990), they invested ($400) million to revolutionize computer processing, implement logic programming, and improve artificial intelligence. Unfortunately, most ambitious targets have not been met, (FGCP) funding has stopped, and AI has been knocked out of the spotlight.

The nineties of the last century witnessed great developments in the field of artificial intelligence, as artificial intelligence returned strongly and with an undeniable impact. This time, computerized automation began to emerge, and the nineties saw the beginning of the development of artificial intelligence as it moved from physical robots to digital software (AIbees, 2023, p.6). Researchers also began to use statistical methods to learn patterns and features directly from data, rather than relying on predefined rules. Medical Imaging (Gold, 2023, p. 7).

Oliveira (2023, p.1) explains that the pace of acceleration in artificial intelligence science began at the beginning of the current century, as the development of artificial intelligence has profoundly transformed how we interact with technology and how we perform our professional activities, and artificial intelligence is increasingly able to perform complex cognitive tasks, replace repetitive tasks, and even make decisions based on large quantities.

The year 2018 was a major qualitative leap for artificial intelligence, as this technology has developed more than it was on the ground, and it has become an essential tool used in all fields, as artificial intelligence has emerged from research laboratories and science fiction novels and has become an essential part of daily life, starting from helping to navigate cities and avoid traffic, to creating virtual assistants to assist in performing various tasks (Al-Mahdi, 2021, p. 107).

2.6. Artificial Intelligence in University Education

According to Arnett's fifth report, called "Teaching in the Machine Age", the progress the world is witnessing in the technological field will be a great achievement and an important leap in all areas of life, especially in the educational field, where technology, with the resulting techniques and applications, the most important of which is artificial intelligence, will help advance the educational process and achieve maximum quality in the near future. And interpret data that is difficult for a faculty member to analyze and measure, such as; multiple-choice English language questions, artificial intelligence systems go into great depth in analyzing the student's reactions and trying to find out the most difficult point for him that requires a lot of time from him to understand and then answer it, artificial intelligence according to Arnett Thomas is one of the best methods to help in education and never poses any threat to the educational function, but rather helps facilitate and simplify educational functions and help in administrative work in schools and various educational institutions (Abdul Latif, 2020, Ahmed, et al, 2023).

Al-Suwaidi and Al-Juhani (2023, p. 27) add that although the use of artificial intelligence in education has a relatively short history, it has gained rapid popularity in recent years, especially in the sixties and seventies, when researchers began to employ computers to provide personalized instructions to adapt to the needs of students, and in the early 2000s, the development in machine learning, natural language processing and inputs contributed to the development of educational tools that are more advanced and sophisticated. From the previous tools that work with artificial intelligence, these tools were very able to adapt to the needs of learners, whether individuals or groups, represented by students of various universities and colleges and to provide personalized education.

Al-Mahdi (2021, p. 111) adds that artificial intelligence applications with their various features have increased the importance of their use in the educational process, because the machine learning programs included in artificial intelligence analyze information, obtain conclusions, and then make appropriate decisions, and thus the basic system based on machine learning can be taught through a lot of data, which allows it to carry out different tasks. Large learning platforms such as Carnegie Learning contribute to investing in AI to provide more personalized courses that allow the creation of individual instructions, tests and feedback that will help learners fill gaps in their knowledge and study and can scan and analyze learners' facial expressions if its applications and programs become smarter.

2.7. Artificial Intelligence Application (ChatGPT)

(ChatGPT) application is an abbreviation that refers to "Chat Generative Pre-trained transformer", and the application (ChatGPT) is a technology developed by the American artificial intelligence research company (Open Al) in November (2022), in San Francisco this company is managed by "Sam Ultman", and one of the most important companies that support (Open Al) was "Microsoft", and the technology mogul "Elon Mask", and the company trained that application using large and huge numbers of information available on the Internet and others From public sources, including conversations between humans so that the application can produce texts that are very similar to human texts by learning algorithms that analyze a large number of data and work like the human brain (Mohammed, 2023, p. 7).

Ina (2022) defined ChatGPT as "a huge language model trained by OpenAI, founded by the company's team in 2021, designed to help users produce texts similar to texts written by

humans according to specific inputs and commands to which it responds, and can be used for many tasks such as creating dialogue or translating languages."

ChatGPT is one of the most important models of smart programs available at present, as this application has many capabilities through which it can practice different tasks and work, due to its prior training to analyze large amounts of text data sent through the smart application and customize it to specific use cases (Eid, 2023, p. 5).

2.8. Using ChatGPT in Education

ChatGPT is a linguistic model that has a great ability to revolutionize the field of education, due to its great ability to understand natural language inputs and respond quickly to them like human behaviour, GPT is used in many and varied ways and methods to support the learning process and increase its efficiency, especially the student and teacher, and the following are many ways through which it can be employed and used in education well, as Sakthi points out (2023) that it is possible to use GPT in education in the following areas:

1. Machine Learning: GPT is used as a robotic teacher to give students and provide them with quick feedback and support, and teachers can program (GPT) to answer questions related to specific topics, such as mathematics or English, and support students with detailed explanations and additional resources so that they can understand the material, and many students can consider it as a valuable resource, especially those who study alone based on self-learning.
2. Personal Notes: GPT is used to provide personal feedback to students, for example, teachers use it to classify tasks and duties, provide constructive criticism, and give suggestions for improvement and development, which in turn helps students see the areas in which they need to develop and give them motivation to continue achievement.
3. Interactive tests: GPT is able to create interactive tests for students, where it can be programmed to present, give questions, provide answers to them, and even provide additional information to help students understand the curriculum well, and this can help integrate students into the education process and make it more effective and fun.
4. Virtual Classrooms: Through (GPT), the teacher can provide support to his students in the virtual classrooms, and in the distance learning process, where teachers can use it to answer all students' questions of all kinds in the chat box during live lectures and works to provide various additional resources, and is a support for students, especially those who have difficulty adapting to their peers in the class.

2.9.Using ChatGPT at the University

Al-Suwaidi and Al-Juhani (2023, p. 27) point out some ways for using ChatGPT at university as follows:

1. The use of (ChatGPT) in statistical analysis:

Statistical analysis is an important factor in all areas of life, as it contributes to the organization, discovery and interpretation of information, and therefore it is a key factor in the decision-making process and planning for the future, statistics deals with a large volume of information and statistical analysis contributes to the collection, analysis and interpretation of this information and present it in digital form to take appropriate actions and decisions, and the application (GPT) can analyze previous information and predict future information and data on a large scale, and what distinguishes it is that it gives non-specialized individuals in the science of statistical analysis the ability to use it.

2. The use of ChatGPT in academic writing:

The advantages of applying GPT in academic writing are as follows:

1) Contribute to providing appropriate content for the entered search word, whatever it is, in addition to choosing a formula that suits the needs of the user, and includes the letters he wishes to write.

2) His ability to write stories and tell them according to the desired topic.

3) Ability to write advertising content and contribute to its translation into other languages.

4) His ability to write a person's CV if GPT gives the user's personal information, such as but not limited to (place of residence, and academic qualifications) that GPT arranges professionally.

3. The use of (ChatGPT) in scientific research:

The advantages of (GPT) in scientific research are as follows:

GPT is used to create a high-quality research paper, with the ability to:

1) Give an overview of the topic: GPT helps in the process of searching for all information from different sources, by entering keywords into the GPT application related to the topic in question, it will be able to write a list of articles and papers related to the topic, thus saving time and effort in reviewing the literature.
2) Ask research questions or hypotheses: When providing (GPT) with basic concepts and information related to the research topic, the chat will be able to write a list of expected research questions based on the topic and information provided, and the questions submitted are reviewed and questions that suit the scope and purpose of the research are determined, in addition to employing it to form hypotheses based on the selected research questions.
3) Create a sketch for the research paper: Upon completion of the research, the (GPT) application is employed to make a detailed outline of the paper by providing it with the basic concepts and ideas that will be addressed by the research, as the (GPT) application has its ability to create a logical structure for the research paper that includes (introduction sections, methods, results, and conclusion) in a way that ensures the organization of the paper scientifically and well.
4) Create custom text for each paragraph in the research paper: Upon completion of the outline, the GPT application is employed to create a text for each section of the research paper, for example, it can be asked to write the introduction or conclusion section and others. And that's quick and easy.
5) Ensure that the text follows the correct formatting guidelines: By providing GPT with the formatting guidelines of the research paper such as citation style, font type, and margin size, it is ascertained whether the text of the research paper follows the required formatting guidelines or not, which is an important tool in ascertaining this.

3. METHODOLOGY

According to the nature of the study and its objectives, the descriptive analytical approach was used to prepare a list of reading comprehension skills in English using a questionnaire (presented to a group of arbitrators) and then using the experimental method to measure the effectiveness of the teaching program through the semi-experimental design with two groups (experimental and control).

Table (1) shows the experimental design used in this study:

Pre-Test	Experimental treatments	Study groups	Post-Test
Reading Comprehension Test (only Experimental group)	Teaching Program based on ChatGPT	Experimental Group (30)	Reading Comprehension
	Traditional Teaching Method	Control Group (30)	

Source: Research database. Own elaboration

3.1. Participants and data collection

The study population consisted of all (7010) students of the English language course at King Abdulaziz University in the first semester of (2023-2024), according to the statistics of the Deanship of Admission and Registration, and due to the nature of research that aims to understand the situation or phenomenon and deepen it without the desire or need for generalization, the students were selected intentionally (where the researcher teaches the English language course at King Abdulaziz University). It is a non-probability sample, and it is a branch of sample selection, it uses non-random methods to select a group of people (Daliu, 2022) from first-year students studying the English language course, where they were divided into two groups, each group containing (30) students, where the experiment was applied using the semi-experimental approach to apply the ChatGPT-based teaching program to develop reading comprehension skills among English language students.

3.2. Instrument

Preparing The Teaching Program Based on ChatGPT:

The ChatGPT-based teaching program was prepared to teach the (first, third, fourth, fifth, and sixth) units of (Evolve Level 1, Student's Book) and the reason for choosing these units is because they contain reading texts, and the guide included the following:

1. Introduction.

2. The general objective of the program: is to provide English Language (undergraduate level) with reading comprehension skills, which are: (literal comprehension, deductive comprehension, critical comprehension, inferential comprehension, and creative comprehension).

3. The specific objectives of the program, which are as follows:

Through the acquisition of English language students at King Abdulaziz University extensive knowledge of reading comprehension skills and using the artificial intelligence application ChatGPT, namely: skills (literal comprehension, deductive comprehension, critical comprehension, inferential comprehension, creative comprehension), to reach a high degree of awareness of these skills and develop them. After undergoing the teaching program, English language students are expected to:

1. To acquire literal comprehension skills.

2. To acquire aesthetic comprehension skills.

3. Acquire critical comprehension skills.

4. To acquire deductive comprehension skills.

5. Acquire creative comprehension skills.

3.3.Research Tools

Tool 1: Questionnaire (List of Reading Comprehension Skills):

A list of reading comprehension skills (designed by the researcher) was prepared and judged by a group of specialists. This study aims to develop reading comprehension skills in English, which are suitable for undergraduate students. The final image of this list consisted of five skills: the literal comprehension skill which included (5) sub-skills, the aesthetic comprehension skill and included (1) sub-skill, the critical comprehension skill which included (4) sub-skills, the deductive comprehension skill which included (4) sub-skills, and the creative comprehension skill which included (3) sub-skills.

Tool 2: Reading Comprehension Skills Test:

The reading comprehension test (by the researcher) is designed based on a list of skills that have been prepared in advance. It includes reading comprehension skills, namely: the literal comprehension skill which consists of (4) sub-questions, the deductive comprehension skill consists of (4) sub-questions, the critical comprehension skill consists of (4) sub-questions, the aesthetic comprehension skill consists of a sub-question, and the creative comprehension skill consisted of (2) sub-questions.

3.4.Data Analysis

The stability of the test was calculated by the coefficient of stability of Kuder-Richardson- and Table 2. shows the results of calculating the stability coefficient for the reading comprehension skills test.

Table 2. Stability coefficient values for reading comprehension skills test:

stability	Reading comprehension skills	Number of vocabulary	Coefficient of Coder-Richardson-20
Reading Comprehension Test	Literal Comprehension	4	4 0.856
	Deductive comprehension	4	4 0.822
	Critical Understanding	4	4 0.801
	aesthetic comprehension	1	1 0.884
	Creative Comprehension	2	2 0.901
			0.884
	Overall Test	15	0.961

Source: Research database. Own elaboration

It is clear from **Table 2.** that the value of the stability coefficient for the test as a whole was acceptable, as the value of the Coefficient of stability of Coder-Richardson-20 for the total test was (0.961), and this value is acceptable because it is higher than the permissible limit (0.70), and therefore the reading comprehension skills test is highly stable and can be trusted and applied to the research sample.

4. RESULTS AND DISCUSSION

To find the equivalence indicators between the experimental and control groups in

the pre-application of the reading comprehension skills scale among English language students at the university level, the equivalence of the experimental and control groups was verified before subjecting the experimental group to the test and examining the differences between them using the "T" test for independent sample. Table 3. shows the results of that.

Table 3. A test for independent samples to detect differences in reading comprehension skills among undergraduate English language students among members of the two groups (experimental and control) in the pre-application:

Dimension	Group	Number	Arithmetic mean	Standard deviation	Degrees of freedom	Calculated T value	Significance level	
Literal comprehension skills	Control	30	8.90	1.43				
	Experimental	30	8.95		58	0.163	0.871	1.32
Deductive Comprehension Skills	Control	30	9.10					1.40
	Experimental	30	9.14		58	0.097	0.923	1.23
Critical Comprehension Skills	Control	30	9.22					1.35
	Experimental	30	9.43		58	0.635	0.528	1.17
Aesthetic comprehension skills	Control	30	9.20					1.29
	Experimental	30	9.33		58	0.416	0.679	1.18
Creative Comprehension Skills	Control	30	9.18					1.34
	Experimental	30	9.15		58	0.096	0.923	1.33
Total Grade	Control	30	9.12					1.07
	Experimental	30	9.20		58	0.571	0.770	1.03

Data in **Table 3.** indicate that there are no statistically significant differences between the average performance of the members of the control and experimental groups between the reading comprehension skills of English language students at the university level, whether on the total degree or the sub-skills, and this means that the two groups are equivalent.

The main question:" What is the ChatGPT-based teaching program and its effectiveness in developing reading comprehension skills among undergraduate English language students?".

Was answered as follows:

After reviewing the educational literature that dealt with the preparation and design of programs, a teaching program based on (ChatGPT) was prepared, and a guide was prepared for its use, then the program was presented to a group of arbitrators to provide their opinions and make the necessary adjustments according to their own point of view, and then the final picture of the program was reached. The ChatGPT-based teaching program has been prepared to teach the (first, third, fourth, fifth and sixth) units of (Evolve Level 1, Student's Book) and the reason for choosing these units is because they contain reading texts, and the guide included the following:

1. Introduction.

2. The general objective of the program: Developing reading comprehension skills in English among undergraduate students, namely: skill (literal comprehension, deductive comprehension, critical comprehension, aesthetic comprehension, creative comprehension).

3. The specific objectives of the program, which are as follows:

Through the acquisition of English language students at King Abdulaziz University (first level), extensive knowledge of reading comprehension skills and using the application of artificial intelligence (ChatGPT), namely: skill (literal comprehension, deductive comprehension, critical understanding, aesthetic comprehension, creative comprehension), to reach a high degree of awareness of these skills and develop them. After undergoing the teaching program, English language students are expected to:
1) Acquire literal comprehension skills.
2) To acquire aesthetic comprehension skills.
3) Acquire critical comprehension skills.
4) To acquire deductive comprehension skills.
5) Acquire creative comprehension skills.

The sub-questions were answered as follows:

The first question: "What reading comprehension skills in English are needed for undergraduate students?"

To answer this question, a list of Reading Comprehension Skills has been designed, which we can summarize the basic skills that undergraduate students need to develop their understanding of academic texts written in English, with a focus on literal, aesthetic, deductive, critical, and creative comprehension skills.

The (second, third, fourth, fifth, sixth) questions: "What is the effectiveness of a ChatGPT-based teaching program in developing the (literal comprehension, deductive comprehension, critical understanding, aesthetic comprehension, creative comprehension) skills of undergraduate English language students?":

To answer these questions, the "T" test for independent groups was used to determine the significance of the differences between the average scores of the experimental group and the average score of the control group in the level of (literal, deductive, critical, aesthetic, creative) reading comprehension skills and **Table (4)** illustrates this:

Dimension	Group	Standard mean	Standard deviation	Number of individuals	Standard error	Adjusted mean	T-test value	Statistical significance
Literal comprehension skills	Control	8.82	0.92	31	2.31	8.82	-	0.000
	Experimental	12.25	1.55	31	2,31	12,25	110,774	0,000
Critical comprehension skills	Control	9.00	1.33	31	2.33	9.00	-	0.000
	Experimental	12.43	1.12	31	2.48	12.43	97.100	0.000
Aesthetic	Control	9.00	1.33	31	2.33	9.00	-	9.00
	Experimental	12.61	1.21	31	2.33	12.61	119.988	0.000

Comprehension skills								
Creative Comprehension Skills	Control	9.01	1.44	31	2.32	9.01	–	-
	Experimental	12.50	1.07	31	2.32	12.50	112.610	-
Deductive Comprehension Skills	control	8.70	1.38	31	2.31	8.82	-	-
	Experimental	12.27	1.13	31	2.31	12.25	110.774	-

The results from **Table 4.** indicate the effectiveness of (GPT) in improving (literal comprehension, deductive comprehension, critical comprehension, aesthetic comprehension, and creative comprehension) skills among undergraduate English language students in the experimental group, through the interaction of students with a variety of texts and conversations, as it enables students to interact with and discuss these texts, which enhanced their ability to understand the contents of the texts and absorb the information contained in them.

It appears from Table 4. that the standard mean of **literal comprehension** skills in the control group is (8.82), while in the experimental group, it is (12.25) and this indicates that the experimental group achieved better performance in literal comprehension skills compared to the control group, which may indicate a positive effect of the ChatGPT-based teaching program that was applied to the experimental group. Also, GPT helped the students in this group to better understand the meaning of words and determine their exact meanings by explaining the meaning of words in the text through their context or through the dictionary, and also helped the students in the experimental group to understand the meaning of sentences better and identify the relationships between words through its ability to analyze sentences in the text through their grammatical structure and punctuation. This finding is consistent with (Ali, Shamsan, Hezam & Muhammed)'s study titled: "The Impact of Artificial Intelligence (ChatGPT) on Learning Motivation".

Moreover, it appears from Table 4. that the standard mean of **critical comprehension** skills in the control group is (9.00), while in the experimental group, it is (12.43) and this indicates that the performance of the experimental group was significantly higher in critical comprehension skills compared to the control group, which may indicate a positive effect of the ChatGPT-based teaching program that was applied to the experimental group. This result is due to the effectiveness of (GPT) in developing the critical understanding skills of students in the experimental group because the use of GPT encouraged students to think creatively and visualize new ideas, which motivated them to think outside the box and explore new and innovative ideas and use them critically when expressing their opinions, and GPT helped the experimental group to systematically analyze evidence and information through discussions and interaction in chat. This finding is consistent with (Romero et al, 2023) study, which aimed to identify the importance of using ChatGPT at the university as a tool for complex thinking.

Besides, it appears from Table 4. that the standard mean of **aesthetic comprehension** skills in the control group is (9.00), while in the experimental group it is (12.61) and this indicates that the performance of the experimental group was significantly higher in aesthetic comprehension skills compared to the control group, which may indicate a positive effect of the ChatGPT-based teaching program that was applied to the experimental group. The results showed the

positive impact of "GPT Chat" on the experimental group students in terms of developing their skills in aesthetic comprehension.

In Table 4. Also, it appears that the standard mean of **creative comprehension** skills in the control group is (9.01), while in the experimental group it is (12.50) and this indicates that the experimental group's performance was significantly higher in creative comprehension skills compared to the control group, which may indicate a positive effect of the ChatGPT-based teaching program that was applied to the experimental group. The results indicated the contribution of (GPT) in improving the creative thinking skill of students in the experimental group, where (GPT) focused on the machine learning model and artificial intelligence to provide information and stimulate creative understanding among students.

The standard mean of **deductive comprehension** skills in Table 4 in the control group is (8.70), while in the experimental group, it is (12.27), and this indicates that the performance of the experimental group was significantly higher in deductive comprehension skills compared to the control group, which may indicate a positive effect of the ChatGPT-based teaching program that was applied to the experimental group. The results revealed the effectiveness of using "Chat GPT" in enhancing the deductive comprehension skills of the students in the experimental group to stimulate the "Chat GPT" program critical dialogues and discussions, where ideas and discussions were exchanged between the students in the experimental group, which affected their deductive comprehension skills and information analysis interactively and dynamically.

5. CONCLUSION

The study results revealed the effectiveness of the ChatGPT-based teaching program in developing reading comprehension skills among undergraduate English language students, as

the use of the program enhanced the literal, deductive, aesthetic, creative, and critical comprehension skills of the students in the experimental group. In light of these results, the study recommended a set of recommendations as follows:

1. Conducting training courses for faculty members and students on how to use and develop their use of the ChatGPT application in universities.
2. Preparing workshops to educate faculty members about the importance of using ChatGPT in teaching English.
3. Distribute awareness and educational brochures to both managers and supervisors to enhance the role of faculty members in the use of other artificial intelligence applications.
4. Adapt curricula to use ChatGPT.
5. Directing faculty members to use a more interactive educational approach which may lead to increased participation and motivation in the Classroom to improve learning objectives.

Also, some suggestions for future studies as follows:

1. Conducting other studies on the effectiveness of ChatGPT in other skills such as: (creative writing skills, Grammatical accuracy, problem-solving skills, etc.).
2. Applying the study to other subjects such as: (science majors, social sciences, programming, and others).
3. Conducting various studies on different types of artificial intelligence applications such as (Elicit, Semantic Scholar, QuillBot, Gamma, and others).

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