AI Integrated Grammar Teaching in Language Preparatory School

Turgay Kucuk[1]

[1]English Language Teaching Department, Tishk International University, Erbil-KRI, Iraq
Correspondence: Turgay Kucuk, Tishk International University, Erbil, Iraq.
Email: turgay.kucuk@tiu.edu.iq

Doi: 10.23918/ijsses.v11i1p1

Abstract: The main goal of this research is to investigate the impact of artificial intelligence tools such as ChatGPT and chatbots on the acquisition of grammar skills, punctuation, subject-verb agreement, verb tenses, and others among students. Within this setting, a series of groups were established, consisting of twelve control groups and twelve experimental groups, employing the convenience sampling technique. The control group adhered to the traditional method of grammar instruction, whereas the experimental group employed a grammar learning approach that incorporated artificial intelligence capabilities. Based on the findings from tests and interview analyses, it has been ascertained that the integration of artificial intelligence in grammar education has a good impact on students' academic achievement. Implementing Chatbot and ChatGPT technologies in education may provide some challenges, although it may also be an enjoyable endeavor. Simultaneously, conducting controlled tests in broader areas will yield more efficient outcomes. The pre-test data were analyzed using SPSS 27 statistical software. Initially, the students' levels exhibited no variation. However, during the ten-week research, a statistically significant difference of .004 was observed. The experimental group exhibited a statistically significant increase of 27.25% in their success in learning grammar. The study revealed the presence of worries regarding privacy and addiction among students alongside the beneficial features. However, it was determined that the benefits surpassed the drawbacks, and this study will be a useful resource for scholars who will investigate the impact of artificial intelligence tools in education in the future.

Keywords: Artificial Intelligence, Chatbots, ChatGPT, Grammar Teaching

1. Introduction

The area of education is undergoing fast transformations due to advancements in technology. Artificial Intelligence (AI) assumes a particularly significant role in altering the manner in which we engage in learning and teaching activities. Many scholars have conducted studies on the integration of artificial intelligence tools into the field of education and grammar learning, and they have mentioned the benefits that such applications offer, as well as the concerns they bring, albeit a little (Li et al., 2018; Lee & Hwang, 2022; Zhai et al., 2022). The incorporation of Artificial Intelligence (AI) tools like Chatbots and ChatGPT into this field of grammar learning and instruction has resulted in significant transformations within this particular domain (Kim, 2019). The incorporation of this technology offers an abundance of advantages for educators, learners, and the realm of education (Zhai et al., 2021). Simultaneously, the utilization of artificial intelligence to facilitate grammar instruction is progressively gaining strength and significance (Daskan, 2023). In addition to the instruction of grammar, there exists a plethora of technical instruments that employ artificial intelligence capabilities.

Received: Nov. 11, 2023
Accepted: Jan. 28, 2024
Kucuk,T (2023). AI Integrated Grammar Teaching in Language Preparatory School. *International Journal of Social Sciences & Educational Studies*, 11(1), 1-17.

Some examples of these tools include grammatical checks, spelling checking, and spelling correction, as well as automated command-based tools that generate a product without human intervention.

Artificial intelligence applications have become an inevitable component in people's lives in recent years. Artificial intelligence, which is mostly dependent on technology, has had a significant impact on the nation as a whole. To put it briefly, technology and artificial intelligence have revolutionized people's lives (Güzey et al., 2023). It has become a necessary component of people's life in the modern world, appearing on everything from computers to phones to online platforms (Zhai et al., 2021).

When we examine the educational process as a whole, we discover that it is composed of four fundamental combinations. The student, the instructor, the curriculum, and the educational field are these components. Artificial intelligence has had an impact on each of the four components individually. Teachers conducted extensive research on the concept and mechanics of artificial intelligence, while students started utilizing and deriving advantages from applications like ChatGPT and chatbots. Administrators incorporated artificial intelligence into the curriculum development process, and schools underwent reforms to accommodate technological tools tailored for artificial intelligence (Whalen & Mouza, 2023). A high-quality output will be produced when these elements have a positive interaction with one another and contribute to the quality of education (İşler & Kılıç, 2021). The teacher is the most crucial factor in ensuring that these four fundamental elements function as intended (Sun et al., 2021). Up until recently, technology products were mostly created to save instructor data. However, this perspective has since changed, and studies are now conducted with the goal of increasing teacher productivity. The research on artificial intelligence is the most significant of these studies. Thanks to developing artificial intelligence applications, educators can give faster and more effective feedback about student work (Celik et al., 2022).

Compared to other fields, the field of education has been greatly influenced by artificial intelligence, and these changes are especially reflected in the perspectives of students and teachers (Tahiru, 2021). In addition, the use of these tools in classrooms is almost revolutionary. These changes, which emerged in the field of education and trickled down to the classrooms, have provided unlimited benefits for both teachers while teaching grammar subjects and students when learning these subjects. Artificial intelligence-integrated grammar teaching offered to students based on traditional and new education models is adapted to the students' wishes. According to a new study conducted by Chen et al. (2020), students' interests today have expanded and, unlike in old times, they do not enjoy learning grammar. Thanks to artificial intelligence, today students can choose courses according to their interests and wishes. Also, Chen et al. (2020) expressed in their study that students were satisfied that they took elective courses thanks to artificial intelligence according to their wishes and desires. These courses encompassed intelligent education technologies, machine learning, and data mining. In addition, this adaptation enhances the effectiveness of language instruction, enabling learners to achieve their goals with greater speed and ease.Artificial intelligence-integrated grammar education has great benefits for students, teachers and education. Artificial intelligence technologies serve as an assistance for instructors in teaching grammar, acting as a virtual teacher that may pose grammatical problems to students at any time, without any constraints of time or location (Ali et al., 2023; Zhai et al., 2021; Kucuk , 2023a).

According to Sabzalieva and Valentini (2023), the primary advantage of artificial intelligence for students is its ability to deliver prompt feedback. With the use of artificial intelligence and technology, children can learn anything they want to know about in a matter of seconds and get passionate about it. Simultaneously, while students input text using computer keyboards, artificial intelligence (AI) fixes their grammar mistakes, suggests improvements, and even offers writing advice (Alam, 2021). They are able to sharpen their language skills and grow from their errors thanks to prompt correction and instruction. Students find artificial intelligence entertaining and appealing because of its accessibility (Tseng et al., 2022). Whether in a typical classroom, at home, or at the park, students can connect with artificial intelligence and receive assistance from it. Unlike these, Fahimirad and Kotamjani (2018) stated in their study that since teachers cannot always know what students need, artificial intelligence makes it easier for teachers to find student deficiencies. It has been studied that students can reach their goals faster by grouping them according to their interests.

Artificial intelligence-integrated education also has many benefits for teachers. It is widely recognized that the task of reviewing homework assignments can be an exhausting endeavor for educators. For instance, the task of a teacher to access five distinct courses, assess the homework of every student, and thereafter give feedback is a challenging undertaking. According to Fahimirad and Kotamjani's (2018) research, artificial intelligence (AI) serves as a valuable aid to educators, functioning in a manner equivalent to an assistant. The authors use the example of Coursera as an example in this regard. According to the individual, within this educational framework, numerous pupils utilize artificial intelligence platforms to submit their homework assignments, and subsequently, the system alerts teachers to any errors made by the kids. Furthermore, it has been asserted that this technology significantly facilitates the process of evaluating student assignments and assigning grades to educators. According to a separate study conducted by Humble and Mozelius (2019), artificial intelligence has been found to assist educators in developing curricula tailored to address students' areas of deficiency, as well as identifying their strengths and weaknesses. Considering the contemporary era characterized by technological advancements, educators must embrace artificial intelligence (AI) and adapt to technological innovations. According to Alam (2021a), educators who use technology in their personal and professional lives can enhance their professional growth and effectively navigate the ever-evolving landscape of educational resources. Another advantage of artificial intelligence is its ability to assist educators in achieving a harmonious equilibrium between their professional responsibilities and personal relationships. According to Alam (2022), educators who effectively and actively utilize technology and artificial intelligence have the potential to not only save time but also attain a sense of equilibrium in their personal and professional lives. Consequently, individuals protect themselves against burnout and demonstrate passion in their professional endeavors.

Many studies have stated that the advantages of artificial intelligence outweigh the concerns it brings (Karthikeyan, 2023; Baidoo-Anu & Ansah, 2023; Whalen & Mouza, 2023). Even though there are many advantages, it would be useful to conduct a balanced research. In addition to the benefits of artificial intelligence and technology-integrated education, such as accessibility, easy use and interactive features, it also has some barriers (Lee & Hwang, 2022). First of all, one of the barriers to artificial intelligence-integrated education is the lack of human interaction (Baidoo-Anu & Ansah, 2023). In the study, it was determined that artificial intelligence-integrated applications or platforms do not interact like a real teacher

or tutor. Such platforms where there are no real teachers can be a disadvantage for students and negatively affect their academic development (Xu, 2019). The feedback that artificial intelligence provides to students may sometimes be insufficient, or it may not understand the student as much as a teacher. In a study conducted by Kabudi et al. (2021), they stated that AI-integrated education is very beneficial to students, but sometimes it does not fully meet student demands and deficiencies. As the name suggests, artificial intelligence is a formation that has limits and draws information from certain sources. Generally, the solutions or suggestions it offers are limited. After a certain time, he cannot exceed his limits and can get into monotony. Grassini (2023) stated this idea in his study that artificial intelligence constantly imitates people and offers the same answers in different ways. Perhaps the most frightening aspect of artificial intelligence is that it may harm privacy (Oseni et al., 2021; Curzon et al., 2021; Kucuk, 2023b). Among these concerns, it has been stated that information shared on digital platforms may be copied by artificial intelligence tools and used as a threat in the future (Khowaja et al., 2023). In addition, Zhou et al. (2023) In addition to this information, they reported that artificial intelligence stores people's profile information on online platforms and will cause privacy vulnerabilities for people. Since it is no longer possible to escape from technology and artificial intelligence applications in today's world, educators must be ready for education integrated with artificial intelligence, even though it brings some concerns.

2. Literature Review

The concept of artificial intelligence was first put forward by McCarthy at the Dortmund conference in 1956 (Arslan, 2020), and according to research, it has been the subject of many studies (Zhai et al., 2021). Additionally, artificial intelligence is being aggressively utilized in all facets of life now (Li et al., 2018).

Education has experienced a significant change with the combination of changing technology, artificial intelligence and developing information networks (Khang et al., 2023; Kara, 2023). With this change, some concepts that have seemed complex for many years can now be solved very easily. For example, teachers' rapid feedback on an exam they have just completed by students using artificial intelligence tools allows them to measure their academic development (Niu et al., 2022; Kucuk, 2023c). Previously, educators need a week to assess a class's tests and generate a comprehensive analysis, which proved to be an arduous undertaking (Ausat et al., 2023). Teachers, particularly in the education sector, formerly had challenges in comprehending and adapting to advancing technology. However, the current proliferation of artificial intelligence technologies like Chatbots and ChatGPT has facilitated their access to accurate information and effective solutions (Zhou et al., 2023).

It is well recognized that grammatical knowledge and foreign language learning are significant concerns in global education, and the elements influencing this process have been extensively studied for several years (Biswas, 2023). To investigate the effect of chatbots on students' grammar skills, Kim (2019) researched college students in Korea. A total of seventy students were included in this study and divided into control and experimental groups. In his study, which lasted 16 weeks in total, he provided human chat partners to the control group and digital chat partners to the experimental group. Pre-tests and post-tests were applied over time to measure the grammatical skills of the students. According to the results of the study, a positive increase was seen in the grammar levels of both groups, but the success of the chatbot group was quite higher compared to the control group.

Limna et al. (2022), unlike other scholars, conducted very comprehensive research on the effects of AI on students' grammar learning. They examined many studies separately to investigate what kind of effect artificial intelligence has on grammatical issues such as tense and subject-verb aggregation. As a result of detailed and long studies, they came to the following conclusion. Artificial intelligence has already entered education and continues to advance rapidly. They have underlined the fact that students and teachers should use artificial intelligence as an assistant, and this will provide them with endless benefits in learning and teaching grammar. In addition to the benefits that artificial intelligence provides in the field of education, they also talked about the concerns it may cause. These are especially areas of security and privacy. Cheng et al. (2022) also mentioned the same concern in their study. As a result, all scholars have written about the benefits of artificial intelligence as well as the concerns it brings.

Recently, Namatherdhala et al. on grammar learning and teaching of artificial intelligence. (2022) conducted a very in-depth research and analysis. In their study, they emphasized that artificial intelligence is undeniably involved in all areas of life and grammar learning and teaching and that educators must have the necessary knowledge about AI and constantly renew themselves. It has been stated that there is artificial intelligence in every aspect of the field of education and that it is frequently used in grammar learning, teaching, and administrative work.

Awalin et al. (2023) examined the role of artificial intelligence applications in students' grammar acquisition in their recent study and took the students' opinions in this context. Awalin and his accompanying researchers stated that artificial intelligence applications correct students' grammar and spelling errors, provide instant feedback, and also offer a guidance service. In this study, in which they used both questionnaire and interview research methods, they reached the following conclusion: Integrating Grammarly and other artificial intelligence applications into lessons increases the grammar skills of both students, teachers and administrators.

ChatGPT, which attracted one million users in just five days following its launch, is another successful language model for use in education (Biswas, 2023). According to current statistics, this number has grown even more to 180 million users, with about 1.5 people visiting it each month (Duarte, 2023; Kucuk, 2023d). A study by Biswas (2023) investigated ChatGPT's function in education. According to the study's findings, ChatGPT offers a setting that speeds up learning for students by providing them with individualized, interactive support. Also, because it provides individualized support, it has been said to help pupils advance academically. After the research, it was found that this application improved students' performance by raising their motivation and involvement in the classroom. The study conducted by Firat (2023) is supportive and explanatory on this subject. According to his study, ChatGPT encourages students to work freely, triggers their curiosity, and more importantly, increases the participation of autodidactic students in class.

Fuchs (2023) has done a study investigating the benefits of other artificial intelligence applications and ChatGPT in the field of education and the concerns they bring. Perhaps the biggest benefit that artificial intelligence provides to students is that it offers solutions according to their needs based on their interests. Furthermore, students can receive timely and proper assistance when they feel the need for guidance. In addition, it provides support for Natural Language Processing (NLP). Besides all these, Fuchs (2023) also focused on the disadvantages of ChatGPT in his comprehensive study. The most worrying aspect of

Scholar ChatGPT is that the accuracy of the information it provides us is questionable. The biggest reasons for this are that such programs do not produce appropriate answers to student and teacher requests since their cognitive abilities are low and they do not have emotional aspects. In addition, such programs make students overly dependent on themselves and minimize students' critical thinking abilities. Fuchs (2023) warns both educators and students on this issue. According to the results of his study, he reported that people who depend on artificial intelligence applications such as chatbots or ChatGPT pacify themselves and accept the information they obtain without subjecting them to any criticism.

In addition to the benefits of integrating artificial intelligence into technology and education, it is also seen that it creates some ethical problems (Huallpa, 2023). A large study was conducted with the participation of 220 university students to analyze the benefits and harms of artificial intelligence applications in the field of education. The research results have yielded very important and noteworthy results. At the same time, when integrating such artificial intelligence applications into education, the moral values of the students, their gender, what kind of background they have and even their gender distribution need to be reviewed. Most importantly, such applications must be filtered by people who know the subject before being integrated into education (Jeon & Lee, 2023).

Ausat et al. (2023)'s studies on AI are similar to the studies of Jeon and Lee (2023). In both studies, they reported that teachers experienced great difficulties in the transition period and adaptation to ChatGPT and other artificial intelligence applications. The common conclusion of many studies on artificial intelligence is that artificial intelligence applications have made significant progress in education and other fields, and these advances will continue in the future. In addition to this information, it has been stated that artificial intelligence applications cannot replace an entrepreneur or teacher, but can be used as an auxiliary material in education and training. As a result, it has become necessary for rapidly advancing artificial intelligence applications to be accepted correctly and used in education and other fields. (Xu, 2019; Firat, 2023; Sabzalieva & Valentini, 2023).

In order to optimize the educational experience, evaluating the advantages offered by artificial intelligence applications such as Chatbots and ChatGPT and the concerns they bring, using different research methods, rich evaluation methods and feedbacks will be of great benefit to both teachers and students.

2.1 Purpose of the Study

The purpose of this research endeavor was to investigate the impact and significance of artificial intelligence on the acquisition of grammar skills among students enrolled at the language preparatory school of Tishk University in Iraq. The students of the university's language preparation school were selected based on their exclusive focus on English language studies for a year, as well as their affinity for using technology gadgets such as phones and tablets. Conducting this study at the language preparation school of Tishk University, as well as in the language education departments of other institutions or schools, will provide favorable outcomes. The goal of this study was to assess the potential difference in academic progress between the control group and the experimental group by incorporating artificial intelligence (AI) techniques into grammar instruction. During the course of this study, students were chosen to participate on a voluntary basis, and the responses provided by the students were treated as secret and not disclosed to other students. Prior to commencing the study, students were duly informed and

cautioned of the duration of the study, with a particular emphasis on the need to safeguard privacy. The study of grammar has a significant role in the acquisition of foreign languages. In the modern day, artificial intelligence plays a crucial role in several educational domains, particularly in the realm of grammar instruction. In this particular setting, two research questions were attempted to be answered. This will highlight the benefits of artificial intelligence technologies, such as chatbots and ChatGPT, in facilitating grammar acquisition, as well as the associated challenges they raise.

1. What are the contributions of artificial intelligence (AI) tools to students' grammar acquisition?
2. What disparities would arise between grammar education that incorporates artificial intelligence and education that is centered around teachers?

3. Methodology

3.1 Research Design

In this study, a mixed method was used to combine and analyze the students' answers to the interview and the data obtained from the pre-test and post-test. The researcher used several instruments to ensure the validity and reliability of the study. The Oxford Placement Test, which consists of grammar questions that had been applied to other preparatory classes at the beginning of the study and were checked by the examination commission, was applied to the control and experimental groups. Cronbach Alpha index was calculated as .86, and this result showed that the questions were prepared according to student levels and met the reliability criteria. The same procedures were applied during the post-test. Quantitative data was obtained by applying a pre-test to see the levels of the two groups at the beginning of the study and a post-test to measure the academic success of the students at the end of the study. As a result of the study, a semi-structured interview was applied to get the students' opinions about artificial intelligence, qualitative data was obtained, and the obtained data was analyzed. During the preparation of the interview questions, the perspectives of academics with prior experience in this field were considered, and any questions that may provide a challenge for the students were eliminated. An endeavor was undertaken to formulate questions in accordance with the proficiency levels of the pupils. The interview questions were validated by administering them to a pilot group before being used with the students included in the study.

3.2 Participants

This study was conducted with the participation of 24 students at the language preparatory school of Tishk University in the 2022-2023 academic year. Students were selected based on volunteering using the Convenience Sampling method. Using this method, the attitudes of students in different classes about learning grammar were learned (Lynn, 2019). In addition, this method helps the researcher to collect data quickly, be cost-effective, and finally reach results quickly. Twelve students, five girls, and seven boys, were placed in the control group, and 12 students, seven boys, and five girls were placed in the experimental group. According to the common European framework of reference for languages (CEFR) standards, the students' level is at the B2 level.

3.3 Data Collection Procedure

The duration of this investigation included a precise period of ten weeks. The reason why this study took ten weeks is that students completed approximately one unit in two weeks. For this reason, the study lasted for ten weeks, and the students completed 4 units and were subjected to a comprehensive exam on the grammar sections of these three units. Initially, a language proficiency assessment was administered to all students enrolled in the language preparatory school in order to evaluate their aptitude in a foreign language. The purpose of this test was to evaluate students' ability in the four core English language skills: reading, listening, speaking, and writing. Ninety minutes was the time limit for the students. Students answered listening, reading, and writing-related questions in order throughout the course of ninety minutes. When the test was over, instructors gave a speaking test with three different levels of difficulty to see how well the students could communicate orally. This test was applied to all students who would study in the preparatory class. The students' mean score on the test was 52.3, according to the data. The exams were examined and analyzed by the exam commission. Using a convenience random sampling technique on volunteering, a total of 12 students were assigned to the control group and another 12 students to the experimental classroom based on the results of this evaluation. While distributing the students to the control and experimental groups, care was taken to ensure a homogeneous distribution, and care was taken to ensure that the knowledge levels of the students in both classes were close to each other according to the test results.

The students in the control group were provided with grammatical education using the teacher-centered Scope-2 book of Oxford University Press, without employing any technological apps or artificial intelligence techniques apart from the book. Scope books are world-renowned, and their reliability has been proven by scholars (Hughes, 2019). The experimental group was granted permission to utilize their mobile devices during grammar courses, and whenever they experienced any challenges in grammar, they received assistance from chatbots, specifically ChatGPT, as well as other online programs. Students mostly preferred to use ChatGPT because it is more modern, user-friendly, responds quickly, generates answers tailored to students' requests, and most importantly, is free. Students commonly utilized artificial intelligence programs to tackle spelling errors, prevalent grammatical faults, and confusing grammar concerns, hence obtaining prompt responses and comments on grammar. The students were closely monitored by teachers while utilizing these artificial intelligence platforms. While students were using chatbots and ChatGPT applications, they were warned and supervised by teachers to use them only for answering questions and for lesson purposes. For example, to find grammatical errors within a paragraph, the teacher allowed the students to use the ChatGPT application. In some courses, for example, when students learned the present simple, they opened the chatbot application and asked questions to the chatbots and received answers using only the present simple. Teachers did not allow students to use their phones for any other purpose, and thus, this study tried to determine the effect of the targeted artificial intelligence applications on students' grammar education.

In the second stage, a twenty-five-question pre-test that was created by Oxford University Press and approved by the teachers at the language school was given to the control group and the experimental group to determine their starting levels of grammatical competency. The questions were chosen from the sources of the Scope-2 book that the students had been studying, and the language preparatory school teachers

verified them. Pre-tests are an important instrument for evaluating students' early academic competency (Stratton, 2019). Conventional grammar instruction focused on the teacher was given to the control group. The experimental group received education in grammar along with additional support from ChatGPT, an AI tool. During grammar courses, the experimental groups used ChatGPT and artificial intelligence tools under the teacher's supervision on their mobile devices.

A post-test of thirty questions was given at the conclusion of the tenth week of the study to assess the students' academic development and grammar competency. Post-test questions were taken from Oxford University Press' own resources. The answers that the pupils provided were recorded for examination. While creating the pre-test and post-test questions, they were checked by the exam committee, and care was taken to prepare them in accordance with the student level. Semi-structured interviews were used to get the students' opinions on artificial intelligence and to evaluate how the ten-week study affected them. The purpose of doing this form of interview is to help students in articulating their thoughts, experiences, and emotions more effectively, hence achieving more precise outcomes. Prior to the interview, the interview questions were reviewed by proficient educators, and a total of 14 students took part in the interview. Before collecting students' opinions, they were reminded that this information would not be shared with others using their names. While recording the students' opinions, privacy was taken into consideration, and one student's opinion was not shared with another. The opinions of the students were then documented

4. Findings

The findings in this section are collected under three main headings. Pre-test, post-test, and interviews. Through these studies, our objective was to ascertain the advantages of utilizing artificial intelligence tools in the context of students' grammar acquisition. Additionally, we aimed to highlight the distinctions between teacher-centered education and education centered around artificial intelligence.

In line with the information obtained, educators' integration of artificial intelligence applications into grammar lessons will yield beneficial results both for themselves and for the students. According to study analysis, artificial intelligence acts as an assistant for teachers and an emergency whole for students. The important thing to consider is to prevent students from being overly dependent on artificial intelligence applications and to provide environments where students can easily express their thoughts. While doing this study, it was difficult to implement the study because there was not much work on the grammar learning of artificial intelligence before, this study would serve as an example for future studies, and more productive results could be obtained if it was carried out with slightly larger groups and over a longer period of time.

Table 1. Pre-test and Post-test Results of the Experimental and Control Groups in Grammar Levels

Variables	Measurement	*N*	*M*	*SD*	*t*	*df*	*p*
Pre-test	Control	12	58.58	12.369			
Pre-test	Experimental	12	60.83	13.176	-.431	22	.670
Post-test	Control	12	70.75	5.396			
Post-test	Experimental	12	88.08	6.501	-7.107	22	.001

The results of the students' grammar pre- and post-tests are displayed in Table 1. A pre-test was used at the beginning of the study to determine the students' levels in the experimental group and control group. SPSS was used to investigate the acquired data. The average for the experimental group was 60.83, while the average for the control group was 58.58, indicating that there was no significant difference between the two groups at the beginning, according to estimated t-statistics. At the end of the ten weeks, a thirty-question test prepared by Oxford University Press was administered to both groups to measure their grammar levels. The questions for both tests were prepared and analyzed to ensure transparency. They were reviewed by an experienced exam committee and tested on parallel courses as a pilot application. According to the SPSS t-statistics results, the control group increased from 58.58 to 70.75, showing an increase of 12.17. In the experimental group with artificial intelligence tools and ChatGPT integrated, it increased from 60.83 to 88.08, showing an increase of 27.25. According to the t-statistics results, there is a significant difference of .001 between the experimental group and the control group, and the p-value is .670. According to the results obtained, artificial intelligence-integrated grammar lessons have a serious role in increasing students' grammar levels.

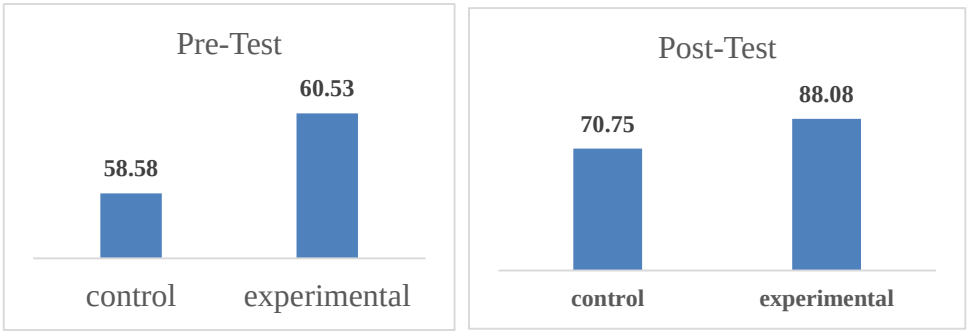

Figure 1: Differences between control and experimental groups in pre-test and post-test.

Figure 1 illustrates the disparities in students' grammar proficiency levels before and after the pre-test and post-test examinations. The graph clearly illustrates a minimal disparity of 1.95 between the two groups at the beginning of the investigation. Based on this information, it may be inferred that the students' grammatical proficiency levels are similar and that the control and experimental groups have been appropriately established. Upon analyzing the second figure on the right, we ascertain a disparity of 17.33 between the two groups. Based on this data, it is evident that the experimental group, who received

grammatical instruction combined with artificial intelligence, had more success compared to the control group, which followed a teacher-centered approach.

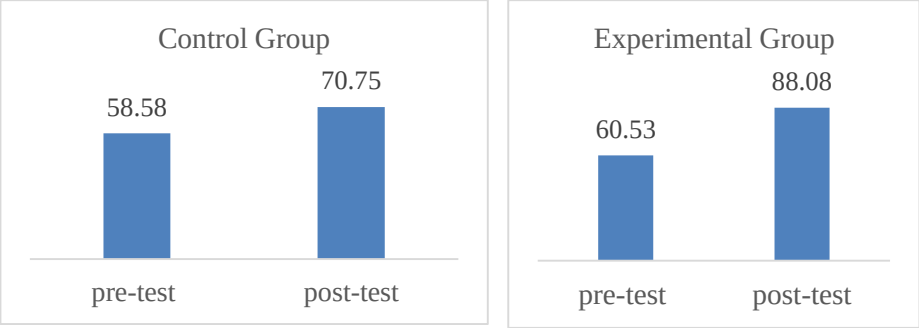

Figure 2: Enhancement in grammatical proficiency in both the control and experimental groups.

Figure 2 shows the Enhancement in the grammatical level of the control and experimental groups. When the figure on the left belonging to the control group is examined, the average success rate, which was 58.58 in the pre-test, increased to 70.75, an increase of 12.17. The figure on the right shows the increase in success of the experimental group. Their average, which was 60.53 at the beginning of the study, increased to 88.08, showing a significant increase of 27.55. Although these statistics offer valuable insights and promote traditional book-based learning, students' grammatical proficiency remains restricted. Conversely, there is a notable surge in the number of pupils benefiting from grammar instruction coupled with artificial intelligence. The discrepancy was evident in the Spss-27 t-static analysis, with a value of .001.

4.1 Interview Analysis

In this part of the study, students were asked about what they thought about artificial intelligence-integrated grammar lessons, and the analysis of the students' answers is as follows. The feedback gathered from the students played a pivotal role in demonstrating the influence of artificial intelligence applications on grammar and the associated issues, which constituted the objective of our study.

Analyzing the students' responses revealed that it was challenging to keep education distinct from technology and artificial intelligence. Students are growing more used to interactive and customized learning as technology becomes more prevalent in both our daily lives and educational settings. The results of the interview indicate that there are concerns as well as advantages to incorporating artificial intelligence into grammar instruction.

The positive result obtained from the students was that all the students reported that they were excited about the dynamic aspect of artificial intelligence. Student A said, “Since I love technology, I love artificial intelligence integrated courses.” Student D said, “Technology-integrated grammar lessons were very useful for me because I was able to get answers instantly and specifically tailored for me.” When the answers obtained are examined, it is generally more advantageous than the traditional method as it offers interactive features, instant feedback, and specially tailored learning methods for students provided by artificial intelligence applications. The students' prompt response can be attributed to the expeditious

feedback they obtained by articulating the grammatical challenges encountered throughout the courses to ChatGPT and chatbot applications. Indeed, several students in the experimental group explicitly expressed to their professors that the responses provided by ChatGPT precisely aligned with their preferences and catered to their specific requirements. Furthermore, they found the language employed by this program to be easy to understand. In addition, according to the answers received from the students in general, they reported that they found artificial intelligence applications useful because ChatGPT corrected their grammatical errors, and they received answers exactly as they wanted.

Despite the benefits of artificial intelligence applications, there are also some worrying aspects. According to the answers obtained from the students, they emphasized that they have become addicted to artificial intelligence, that they cannot produce anything themselves, and even if they do, they cannot express it for fear of it being wrong. Another concern is that students are worried that the information they share with artificial intelligence tools may be used against them in the future. For example, students stated that their passwords, which they had previously shared on social platforms, were stolen and their private photographs were used for other purposes. In addition, the fact that chatbots and ChatGPT, which are artificial intelligence applications, gave complete and clear answers to the specific questions asked by the students surprised and worried the students.

In line with the data obtained, it is a fact that artificial intelligence is entering our lives more and more day by day and will increase in the future. What needs to be done is to use its beneficial aspects to the maximum extent, while necessary studies should be put forward to minimize the risks that may arise. While integrating artificial intelligence applications into lessons, teachers and students must first undergo training. When using such applications, personal information should not be shared on such platforms and privacy should be kept confidential. Educators who will conduct this type of study will definitely inform their students before the study, which will yield more beneficial results.

5. Discussion

According to the results of the extensive literature review, pre-test and post-test and finally the interview conducted in this study, the great benefits of artificial intelligence integrated grammar teaching on students have emerged. In addition to these benefits, some concerns may arise.

When the pre-test and post-test in the first table are examined, there is no significant difference between the control group and the experimental group at the beginning of the study. This data is supported by the difference of 2.25 between the two groups and it is seen that the levels of the two groups are close to each other. According to the post-test results using SPSS 27 t-statistic calculations, the difference between the two groups has increased significantly. SPSS calculated this data as .001 and proved that the success of the students in the experimental group increased significantly compared to the control group. These results are similar to the results of the Kim (2019) study. In both studies, it was determined that artificial intelligence helped students' academic success and that the grammatical development of students using Chatbot progressed faster than the group that did not use it. In this study conducted at a language preparatory school, students used artificial intelligence platforms, applications on computers phones, and some, as in the Fitria (2021) study, applications such as Google Translate and Chatbot. Both studies yielded common results supporting artificial intelligence. Among the results that emerged are that it

provides individual benefits to students, provides a real conversation environment, gives direct feedback to students and makes learning more personal.

The study of semi-structured interviews, which serves as the final method of data gathering, revealed significant findings. The findings of the study indicated that the students belonging to the experimental group exhibited a higher level of enjoyment towards the grammar lessons facilitated by artificial intelligence tools in comparison to the control group, who received lessons through conventional instructional approaches. The primary rationale for this is that each student possesses a mobile device, which, although prohibited during regular class sessions, is permitted for usage during this particular study. Furthermore, a significant number of contemporary students who are immersed in the era of technology derive immense satisfaction from courses that use artificial intelligence. This is mostly due to their desire to swiftly obtain knowledge and their aversion to arduous routes. According to Khang et al. (2023) and Lee and Hwang (2022), various studies have indicated that students in the experimental group perceived artificial intelligence tools as valuable due to their prompt responsiveness, ability to provide feedback tailored to their requests, constant accessibility, and capacity to rectify grammatical errors. According to Saura et al. (2022), people are worried about artificial intelligence. This study's participants also expressed some worry about AI. As a specific example, during the study, some students asked whether the names and personal information of the students participating in this study would be shared with others or on artificial intelligence applications. The researcher stated that all the feedback they gave, and the data obtained would not be shared using any names or personal information. The issue they are worried about is that in the future, artificial intelligence will be in every aspect of life, and perhaps even artificial intelligence will replace teachers. In addition, they fear becoming dependent on artificial intelligence programs and that their privacy or personal information may be compromised.

Artificial intelligence technologies are, therefore, very beneficial for teaching grammar and for general education, but it is crucial to be able to anticipate potential problems and take appropriate action when necessary. Based on the comprehensive data analysis, we conclude that incorporating artificial intelligence into grammar education has a favourable impact on students' grammar learning. Furthermore, we observe that artificial intelligence-integrated grammar education offers greater advantages compared to traditional teacher-centered grammar education.

6. Conclusion

Upon careful examination of the substantial literature study, pre-test and post-test analysis, as well as the subsequent interview analysis, it becomes evident that artificial intelligence tools yield a favorable impact on students' acquisition of grammar skills. Upon doing a separate analysis of the results, it was seen that the post-test outcomes indicated a higher level of success in grammar acquisition and application among students who received instruction integrated with artificial intelligence (AI). The analysis of the interview findings has unveiled that artificial intelligence tools and ChatGPT have a beneficial impact on students' academic progress and acquisition of grammar skills. These tools offer immediate feedback, continuous availability, error correction for grammatical mistakes, and tailored responses that cater precisely to students' requirements. In addition to the favorable parts of the study, certain issues also surfaced. There is a growing apprehension regarding the impact of artificial intelligence technologies on pupils, as they may foster reliance on technology, promote laziness, encourage the pursuit of simpler alternatives, and

perhaps compromise privacy. These emerging concerns should be taken into account. Using these data obtained in future studies, investigating the effects of artificial intelligence not only on grammar learning but also on writing, listening, speaking, and reading will yield useful results for the scientific world. In a speaking class, students can speak, and AI applications can translate it into text or objectively grade students. In reading lessons, artificial intelligence applications can read the text to students with visual difficulties. As it is known, as the number of students in writing courses increases, it takes a longer time to evaluate student work. Teachers can give feedback to students in a short time by using artificial intelligence programs. More importantly, students who waste their time and do not have a purpose can be directed to artificial intelligence applications and spend quality time learning a language. Based on the acquired data, it is an established reality that artificial intelligence has become integrated into various aspects of our lives, particularly within the realm of education. Furthermore, it is anticipated that its influence will continue to expand and intensify over time. It is imperative for educators to possess a comprehensive understanding of artificial intelligence tools and maintain a vigilant stance toward potential challenges that may emerge. Consequently, it is imperative to see artificial intelligence as a means rather than an ultimate objective, and its significance should not be disregarded. Taking all these studies into consideration, this study will be an enlightener for scholars who will investigate the advantages of artificial intelligence applications in education and the concerns they bring.

References

Alam, A. (2021a, December). Should robots replace teachers? Mobilisation of AI and learning analytics in education. In *2021 International Conference on Advances in Computing, Communication, and Control (ICAC3)* (pp. 1-12). IEEE.

Alam, A. (2021b, November). Possibilities and apprehensions in the landscape of artificial intelligence in education. In *2021 International Conference on Computational Intelligence and Computing Applications (ICCICA)* (pp. 1-8). IEEE.

Alam, A. (2022). Employing adaptive learning and intelligent tutoring robots for virtual classrooms and smart campuses: reforming education in the age of artificial intelligence. In *Advanced Computing and Intelligent Technologies: Proceedings of ICACIT 2022* (pp. 395-406). Singapore: Springer Nature Singapore.

Ali, J. K. M., Shamsan, M. A. A., Hezam, T. A., & Mohammed, A. A. (2023). Impact of ChatGPT on learning motivation: teachers and students' voices. *Journal of English Studies in Arabia Felix*, *2*(1), 41-49.

Arslan, K. (2020). Eğitimde yapay zekâ ve uygulamaları. *Batı Anadolu Eğitim Bilimleri Dergisi*, *11*(1), 71-88.

Ausat, A. M. A., Massang, B., Efendi, M., Nofirman, N., & Riady, Y. (2023). Can chat GPT replace the role of the teacher in the classroom: A fundamental analysis. *Journal on Education*, *5*(4), 16100-16106.

Awalin, A. S. A., Iftanti, E., & Umami, M. S. M. (2023, September). Students' Perceptions on The Impact of Artificial Intelligence on English Grammar Learning. In *International Conference on Education* (pp. 169-174).

Baidoo-Anu, D., & Ansah, L. O. (2023). Education in the era of generative artificial intelligence (AI): Understanding the potential benefits of ChatGPT in promoting teaching and learning. *Journal of AI*, *7*(1), 52-62.

Biswas, S. (2023). Role of Chat GPT in Education. *Available at SSRN 4369981*. https://www.opastpublishers.com/open-access-articles/role-of-chat-gpt-in-education.pdf

Celik, I., Dindar, M., Muukkonen, H., & Järvelä, S. (2022). The promises and challenges of artificial intelligence for teachers: A systematic review of research. *TechTrends*, *66*(4), 616-630.

Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. *Ieee Access*, *8*, 75264-75278.

Cheng, X., Su, L., Luo, X., Benitez, J., & Cai, S. (2022). The good, the bad, and the ugly: Impact of analytics and artificial intelligence-enabled personal information collection on privacy and participation in ridesharing. *European Journal of Information Systems*, *31*(3), 339-363.

Curzon, J., Kosa, T. A., Akalu, R., & El-Khatib, K. (2021). Privacy and artificial intelligence. *IEEE Transactions on Artificial Intelligence*, *2*(2), 96-108.

Daskan, A. (2023). The Challenges of Grammar Learning and Teaching and Students' Perceptions in EFL Classes-Tishk International University, Erbil Case. *International Journal of Social Sciences & Educational Studies*, *10*(3).

Duarte, F. (2023, Nov 23). "*Number of ChatGPT Users*" Discover exploding topics. https://explodingtopics.com/blog/chatgpt-users

Fahimirad, M., & Kotamjani, S. S. (2018). A review on application of artificial intelligence in teaching and learning in educational contexts. *International Journal of Learning and Development*, *8*(4), 106-118.

Firat, M. (2023). How chat GPT can transform autodidactic experiences and open education. *Department of Distance Education, Open Education Faculty, Anadolu Unive*.

Fitria, T. N. (2021). The use technology based on artificial intelligence in English teaching and learning. *ELT Echo: The Journal of English Language Teaching in Foreign Language Context*, *6*(2), 213-223.

Fuchs, K. (2023, May). Exploring the opportunities and challenges of NLP models in higher education: is Chat GPT a blessing or a curse?. In *Frontiers in Education* (Vol. 8, p. 1166682). Frontiers.

Grassini, S. (2023). Shaping the future of education: exploring the potential and consequences of AI and ChatGPT in educational settings. *Education Sciences*, *13*(7), 692.

Güzey, C., Çakir, O., Athar, M. H., & Yurdaöz, E. (2023). Eğitimde Yapay Zekâ Üzerine Gerçekleştirilmiş Araştırmalardaki Eğilimlerin İncelenmesi. *Bilgi ve İletişim Teknolojileri Dergisi*, *5*(1), 67-78.

Huallpa, J. J. (2023). Exploring the ethical considerations of using Chat GPT in university education. *Periodicals of Engineering and Natural Sciences*, *11*(4), 105-115.

Hughes, S. H. (2019). Coursebooks: Is there more than meets the eye?. *ELT Journal*, *73*(4), 447-455.

Humble, N., & Mozelius, P. (2019, October). Artificial intelligence in education—A promise, a threat or a hype. In *Proceedings of the european conference on the impact of artificial intelligence and robotics* (pp. 149-156).

İşler, B., & Kiliç, M. (2021). Eğitimde Yapay Zekâ Kullanimi ve Gelişimi. *Yeni Medya Elektronik Dergisi*, *5*(1), 1-11.

Jeon, J., & Lee, S. (2023). Large language models in education: A focus on the complementary relationship between human teachers and ChatGPT. *Education and Information Technologies*, 1-20.

Kabudi, T., Pappas, I., & Olsen, D. H. (2021). AI-enabled adaptive learning systems: A systematic mapping of the literature. *Computers and Education: Artificial Intelligence*, *2*, 100017.

Kara, S. (2023). The Effects of Web 2.0 Tools on Foundation English StudentsSuccess Rates at A Private University in Iraq. *International Journal of Social Sciences & Educational Studies*, *10*(1), 22.

Karthikeyan, C. (2023). Literature Review on Pros and Cons of ChatGPT Implications in Education. *International Journal of Science and Research (IJSR)*, *12*(3).

Khang, A., Muthmainnah, M., Seraj, P. M. I., Al Yakin, A., & Obaid, A. J. (2023). AI-Aided Teaching Model in Education 5.0. In *Handbook of Research on AI-Based Technologies and Applications in the Era of the Metaverse* (pp. 83-104). IGI Global.

Khowaja, S. A., Khuwaja, P., & Dev, K. (2023). ChatGPT Needs SPADE (Sustainability, PrivAcy, Digital divide, and Ethics) Evaluation: A Review. *arXiv preprint arXiv:2305.03123*.

Kim, N. Y. (2019). A Study on the Use of Artificial Intelligence Chatbots for Improving English Grammar Skills. *Journal of Digital Convergence*, *17*(8), 37-46. https://koreascience.kr/article/JAKO201925454134461.pdf

Kucuk, T. (2023). Factors Leading to Writing Anxiety in EFL Classes. *International Journal of Social Sciences & Educational Studies*, *10*(1), 1-12.

Kucuk, T. (2023). Ronaki International School–Erbil (RISE) Students' Attitudes Toward Online Assignment in Learning Management System (LMS). *International Journal of Social Sciences & Educational Studies*, *10*(3), 392-402.

Kucuk, T. (2023). Students' Perceptions of The Use of ICT Tools in Language Preparatory School. *Arab World English Journal (AWEJ) Volume*, *14*.

Kucuk, T. (2023). Technology integrated teaching and its positive and negative impacts on education. *International Journal of Social Sciences & Educational Studies*, *10*(1), 46-55.

Lee, H., & Hwang, Y. (2022). Technology-enhanced education through VR-making and metaverse-linking to foster teacher readiness and sustainable learning. *Sustainability*, *14*(8), 4786.

Li, J., Cheng, H., Guo, H., & Qiu, S. (2018). Survey on artificial intelligence for vehicles. *Automotive Innovation*, *1*, 2-14.

Limna, P., Jakwatanatham, S., Siripipattanakul, S., Kaewpuang, P., & Sriboonruang, P. (2022). A review of artificial intelligence (AI) in education during the digital era. *Advance Knowledge for Executives*, *1*(1), 1-9.

Lynn, P. (2019). The advantage and disadvantage of implicitly stratified sampling. *Methods, data, analyses: a journal for quantitative methods and survey methodology (mda)*, *13*(2), 253-266.

Namatherdhala, B., Mazher, N., & Sriram, G. K. (2022). A comprehensive overview of artificial intelligence tends in education. *International Research Journal of Modernization in Engineering Technology and Science*, *4*(7).

Niu, S. J., Luo, J., Niemi, H., Li, X., & Lu, Y. (2022). Teachers' and students' views of using an AI-aided educational platform for supporting teaching and learning at Chinese schools. *Education Sciences*, *12*(12), 858.

Oseni, A., Moustafa, N., Janicke, H., Liu, P., Tari, Z., & Vasilakos, A. (2021). Security and privacy for artificial intelligence: Opportunities and challenges. *arXiv preprint arXiv:2102.04661*.

Sabzalieva, E., & Valentini, A. (2023). ChatGPT and artificial intelligence in higher education: quick start guide. https://eduq.info/xmlui/handle/11515/38828

Saura, J. R., Ribeiro-Soriano, D., & Palacios-Marqués, D. (2022). Assessing behavioral data science privacy issues in government artificial intelligence deployment. *Government Information Quarterly*, *39*(4), 101679.

Stratton, S. J. (2019). Quasi-experimental design (pre-test and post-test studies) in prehospital and disaster research. *Prehospital and disaster medicine*, *34*(6), 573-574.

Sun, Z., Anbarasan, M., & Praveen Kumar, D. J. C. I. (2021). Design of online intelligent English teaching platform based on artificial intelligence techniques. *Computational Intelligence*, *37*(3), 1166-1180.

Tahiru, F. (2021). AI in education: A systematic literature review. *Journal of Cases on Information Technology (JCIT)*, *23*(1), 1-20.

Tseng, C. E., Jung, S. H., Elglaly, Y. N., Liu, Y., & Ludi, S. (2022, February). Exploration on Integrating Accessibility into an AI Course. In *Proceedings of the 53rd ACM Technical Symposium on Computer Science Education-Volume 1* (pp. 864-870).

Whalen, J., & Mouza, C. (2023). ChatGPT: Challenges, Opportunities, and Implications for Teacher Education. *Contemporary Issues in Technology and Teacher Education*, *23*(1), 1-23.

Xu, W. (2019). Toward human-centered AI: a perspective from human-computer interaction. *interactions*, *26*(4), 42-46.

Zhai, X., Chu, X., Chai, C. S., Jong, M. S. Y., Istenic, A., Spector, M., ... & Li, Y. (2021). A Review of Artificial Intelligence (AI) in Education from 2010 to 2020. *Complexity*, *2021*, 1-18.

Zhou, J., Müller, H., Holzinger, A., & Chen, F. (2023). Ethical ChatGPT: Concerns, challenges, and commandments. *arXiv preprint arXiv:2305.10646*.