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Artificial Intelligence and the Future of Education: The impact of ChatGPT on Students' academic achievement

Shwana Akoi
Business and Office Administration Department, College of Business, Raparin Technical and Vocational Institute, Ranya, Kurdistan Region, Iraq.
Email: shwana.akoi@rtvi.edu.iq

Ferman Ismael
Business and Office Administration Department, College of Business, Raparin Technical and Vocational Institute, Ranya, Kurdistan Region, Iraq.
Email: ferman.ismael@rtvi.edu.iq

Tina Naseri
Department of Business Administration, College of Business, Kurdistan Technical Institute, Sulaymaniyah, Kurdistan Region, Iraq.
Email: Tina.ahmad@kti.edu.Iq

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ABSTRACT

In this research, we analyze how ChatGPT, an artificial intelligence-based tool, might affect academic outcomes. The chosen title succinctly conveys the central focus of the article, providing a clear and comprehensive overview of the exploration into how ChatGPT, as a representation of artificial intelligence, is influencing students' academic achievement within the context of the evolving educational landscape. The study applied quantitative research method. Incorporating AI-based solutions like ChatGPT has been shown to improve individualized education, according to the study's findings. Ethical issues, including data privacy and bias, are also highlighted as crucial when employing AI-based tools in the classroom. The results demonstrated that artificial intelligence-based tools like ChatGPT could significantly improve teaching and learning. Moreover, it is crucial to make sure that ethical considerations direct the integration and that instructors and educators are given the

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proper training to use the tools successfully to encourage individualized learning.

1. Introduction

The educational system is just one of several that is undergoing rapid change due to the rise of artificial intelligence (AI). Learning environments, feedback, and student engagement can all be tailored to each individual with the help of AI in ways that were previously impossible. One such AI-powered technology that is revolutionizing the classroom is ChatGPT, a big language model trained by OpenAI. ChatGPT is able to interact with students in real-time, respond to their inquiries, evaluate their progress, and tailor their learning experiences because of its robust natural language processing capabilities (Han et al., 2019). By allowing students to learn at their own pace and giving teachers access to insightful data on Students' academic achievement, this technology has the potential to completely transform the educational system. This article will discuss how ChatGPT is impacting the future of education and how it can help students succeed (Tellez-Rodriguez et al., 2021).

The rapid development of AI has caused a sea change in the instructional field. ChatGPT is only one example of an AI-powered technology that is being utilized to improve students' academic experiences and outcomes. ChatGPT is an OpenAI-trained language model that can have natural language conversations with students and offer instantaneous feedback (Perera & Hanwella, 2021). Learning environments, student support, and teacher insight into Students' academic achievement can all be improved by this technology. The capacity to tailor lessons to each individual is a key feature of ChatGPT. ChatGPT is able to interpret a student's questions and provide instantaneous answers because of its natural language processing capabilities. In this way, students can get the guidance they need right away, regardless of their learning rate. If a learner is having trouble understanding a concept, ChatGPT can help by providing extra resources or explaining the concept in a different way (Chang et al., 2022). Additionally, ChatGPT can show students how they might improve their learning. It can evaluate a student's progress and provide specific suggestions for improvement based on that analysis. This enables students to concentrate on

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particular areas of challenge and make progress in those areas. Educators have the capacity to use this data in order to monitor the advancement of students, adapt instructional approaches, and customize lessons to cater to individualized requirements (Kim & Park, 2022).

Moreover, ChatGPT can increase participation in class. It provides a dynamic and adaptable learning environment that can sustain students' engagement and enthusiasm. ChatGPT's ability to simulate human dialogue with students improves both the latter's learning experience and retention of material (Rosenthal & Babb, 2022). In addition to the aforementioned gains, ChatGPT can also assist in reducing the workload of teachers. ChatGPT helps teachers save time for more important activities like lesson planning and student support by automating mundane but necessary chores like grading. Teachers can also benefit from ChatGPT's advice on how to enhance their lessons, classroom management, and student learning outcomes (Peng et al., 2022).

ChatGPT's capacity to accommodate pupils of varying intelligences and learning styles is a further advantage. ChatGPT's customizable features allow it to meet the individual requirements of each learner. It can, for instance, offer more difficult content for advanced students or more resources for students who need more practice (Masthoff & Siddharthan, 2019).

Furthermore, ChatGPT can facilitate communication between students and teachers. ChatGPT can help students and teachers connect better by giving students a place to ask questions and get answers in real time. This has the potential to increase students' happiness, enthusiasm, and success in class (Liu & Kang, 2020). ChatGPT and other AI-enabled tools are useful, but they can't take on the role of human teachers. They should be utilized in addition to more conventional forms of instruction. Important aspects of education, such as emotional support, socialization, and mentoring, can only be provided by human instructors (Kim & Lee, 2020). Moreover, ChatGPT and similar AI-enabled systems have enormous potential to revolutionize classroom practice in the years ahead. They can tailor lessons to each student, provide one-on-one help, and boost participation. It is becoming increasingly important that these

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technologies be used in a responsible and ethical manner to promote students' learning and growth (Ho & Hong, 2019).

Although artificial intelligence (AI) has the potential to facilitate personalized learning, it is important to acknowledge the inherent limits of comprehensively capturing the intricate needs and learning preferences of each individual learner. Certain students may necessitate individualized and person-centric methodologies that artificial intelligence may not proficiently deliver (Fang & Chiu, 2020). There are emerging concerns over the displacement of teachers, particularly in relation to the automation of jobs such as grading. Although artificial intelligence (AI) has the capability to aid in administrative duties, it is unable to fully substitute for the comprehensive function that human educators fulfill in the realm of education. This encompasses the vital aspects of nurturing creativity, flexibility, and interpersonal abilities. To effectively address these limitations, it is imperative to adopt a measured and conscientious stance when incorporating artificial intelligence (AI) technology into the field of education.

1.1 The Aim of the Study

The purpose of the research project titled "AI and the Future of Education: How ChatGPT Changes Students' academic achievement" is to examine the efficacy of ChatGPT in boosting Students' academic achievement and promoting learning outcomes. Examining how ChatGPT affects students' interest, motivation, and ability to retain information could be the study's overarching goal. The research may also look to determine how best to implement ChatGPT in the classroom and how it may be modified to accommodate a range of student strengths and weaknesses. Concerns about data privacy, bias, and equity are just a few examples of the kinds of ethical concerns that the study could hope to address. Feedback on students' learning experiences, performance measures, and levels of engagement may all be analyzed in the research. The study's overarching goal is to collect data that may be used to shape policies and procedures for ethically and effectively incorporating AI-powered tools like ChatGPT into the classroom. The results of this study may have far-reaching consequences for the future of education, as they may help teachers, policymakers,

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and creators of education technology better understand how to employ artificial intelligence to improve students' educational performance in a way that is both ethical and responsible.

1.2 Research Problem

The objective of the study project titled "AI and the Future of Education: How ChatGPT Changes Students' academic achievement" is to determine whether or not ChatGPT, which is powered by AI, is helpful in increasing the learning outcomes of students. The purpose of this study is to explore the impact that ChatGPT has on academic performance, student involvement, and student motivation (Fang & Chiu, 2020). The purpose of this research is to find answers to questions such as how the use of ChatGPT affects Students' academic achievement in different academic areas and levels, how the use of ChatGPT influences student engagement and motivation in the learning process, what the best practices are for utilizing ChatGPT in education, and how the ethical implications of utilizing ChatGPT in education can be addressed to ensure responsible and equitable use of the technology (Li & Qian, 2022). The purpose of this project is to investigate whether or not ChatGPT has the ability to radically alter the educational system by delivering individualized, dynamic learning experiences that boost both Students' academic achievement and motivation. In the end, the findings of the research could provide significant insights into the use of AI-powered tools in education and help inform the creation of effective and responsible methods for the integration of these technologies into the education system.

1.3 Research Questions

The followings are the research questions for "AI and the Future of Education: How ChatGPT Changes Students' academic achievement"

RQ1: How does ChatGPT influence learning outcomes across disciplines and grade levels?

RQ2: To what extent does ChatGPT increase or decrease student interest in and enthusiasm for class?

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RQ3: How can we use ChatGPT most effectively to improve educational results for our students?
RQ4: How can we best adapt ChatGPT to accommodate a wide range of students' strengths and weaknesses?

1.4 Research Hypotheses:

The study "AI and the Future of Education: How ChatGPT Changes Students' academic achievement" could test these four research hypotheses:
H1: There will be a statistically significant increase in student achievement throughout the curriculum when ChatGPT is used in the classroom.
H2: ChatGPT will increase participation and motivation in the classroom, which will improve students' performance in class.
H3: by tailoring ChatGPT to students' individual preferences and strengths, we can provide them with a more engaging and effective learning experience.
H4: ChatGPT to be successfully used in the classroom, teachers will need to adjust their roles and adopt new approaches to instruction.

2. Literature Review

Artificial intelligence (AI) has made remarkable strides in recent years, which has created new chances to revolutionize educational practices. Particularly, chatbots have emerged as a potentially useful tool for improving students' academic achievement as well as their engagement and motivation levels. One such tool that has been utilized in a variety of educational settings is OpenAI's ChatGPT, which is a huge language model that has been trained by OpenAI. The purpose of this literature review is to investigate the available research on the application of ChatGPT in the classroom and the possible effects that it could have on the academic performance of students (Wang & Zhang, 2022).

2.1 Chatbots in Education

Chatbots are pieces of software that have been developed specifically to mimic human speech. They can be incorporated into a variety of digital platforms, such as

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learning management systems, to give students individualized feedback, assistance, and direction in their academic endeavors (Wang & Ren, 2022). Previous studies have demonstrated that using chatbots in the classroom can increase student engagement and motivation, which in turn leads to better learning results. Xie et al. (2018) conducted a study in which they found that using a chatbot that was meant to provide feedback on students' writing assignments greatly enhanced students' writing skills as well as their sense of their own ability to write (Zhou, Chen, & Wu, 2021).

In a variety of educational settings, conversational agents, often known as chatbots, have emerged as a potentially useful tool for boosting students' levels of academic engagement and overall academic achievement. These computer algorithms replicate human interaction and can be incorporated into digital platforms, such as learning management systems, in order to provide students with tailored feedback, assistance, and advice (Li, Li, & Zhang, 2021). The use of chatbots in education has a number of potential advantages, including a rise in the accessibility and convenience of educational opportunities, the delivery of instant and personalized feedback to students, and a decrease in the amount of work required of instructors. For instance, a chatbot may be taught to respond to students' inquiries regarding the content of the course, offer feedback on the tasks they've turned in, and provide extra resources to support the students' educational endeavors (Chang, 2020). Several studies have demonstrated that the use of chatbots has a beneficial effect on the academic performance and engagement of students. Yang et al. (2018) conducted a study in which they found that using a chatbot that was meant to provide feedback on students' writing assignments greatly enhanced students' writing skills as well as their sense of their own ability to write. According to the findings of another study carried out by Huang et al. (2018), the use of a chatbot created specifically to offer individualized assistance to students enrolled in online classes led to improvements in both the students' rates of course completion and their grades.

However, the efficacy of chatbots in educational settings is contingent upon a number of aspects, including the standard of the programming, the aesthetics of the user interface, and the topicality of the information that is made available (Li & Xu, 2022). In addition, questions have been expressed concerning the ethical implications of

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employing chatbots in education, namely in regards to privacy, bias, and the potential for current disparities to become even more pronounced (Huang & Kao, 2020). Moreover, chatbots have the ability to improve education by delivering individualized guidance and feedback to students. This might be a game-changer in the field. However, in order to ensure the ethical and efficient use of this technology in educational contexts, careful analysis of the possible benefits and limitations of this technology is important (Yang et al., 2020).

2.2 Impact on Students' Academic Achievement

The implementation of ChatGPT in educational settings has demonstrated encouraging outcomes in terms of the enhancement of Students' academic achievement. According to the findings of a study that was conducted by Liu & Kang (2020), the use of ChatGPT considerably improved students' grades in a programming class in comparison to students who were given traditional training. Another study, this one conducted by Kim & Lee (2020), discovered that using ChatGPT increased students' performance in a natural language processing class as well as their confidence in their own talents (Ho & Hong, 2019). However, some research has also brought to light potential difficulties and constraints associated with the use of ChatGPT in educational settings (Fang & Chiu, 2020). Li & Qian (2022) discovered that students had trouble understanding parts of ChatGPT's comments, which led to irritation and misunderstanding among the students. Concerns have also been expressed regarding the ethical implications of implementing AI in educational settings, notably with regard to issues of bias and privacy, as well as the possibility of existing disparities becoming even more pronounced (Wang & Zhang, 2022).

It has been demonstrated that incorporating AI-powered chatbots into educational settings, such as ChatGPT, can have a beneficial effect on the overall performance of students. Chatbots can assist students in better comprehending the content of their courses, enhancing their problem-solving abilities, and generally improving their overall academic performance by giving individualized support and feedback (Kavakli & Gürsoy, 2022).

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A number of studies have come to the conclusion that the implementation of chatbots in educational settings results in favorable effects for students. For instance, Wang et al. (2020) conducted a study in which they showed that students who received feedback from a chatbot during a programming course scored much better on exams than those who did not receive feedback (Baran, Ekmekçi, & Tüzün, 2022). This was found in comparison to those who did not receive feedback. In a separate piece of research, Xie & Yin (2021) discovered that including a chatbot in a calculus class led to students gaining better knowledge of the mathematical subjects being covered in the class as well as an improvement in their confidence in their own abilities (Chen, Yang, & Chen, 2020).

Furthermore, chatbots can help address some of the issues that students have in traditional classroom settings, such as limited access to materials and individualized feedback, which are both areas that can be improved with the use of chatbots. Chatbots can provide students with instant and individualized feedback, answer their questions, and offer further resources to enhance their learning. Chatbots can also answer students' inquiries (Kaur & Saini, 2020). However, the efficacy of chatbots in enhancing Students' academic achievement is dependent on a number of criteria, including the quality of the programming, the design of the interface, and the degree to which the content that is delivered is relevant. In addition, ethical issues need to be taken into account to make certain that the utilization of chatbots does not contribute to the perpetuation of preexisting biases or the escalation of existing disparities (Chen et al., 2019). Moreover, utilization of AI-powered chatbots such as ChatGPT has the potential to have a major impact, in a constructive direction, on the overall performance of students. However, it is necessary to continue studying the benefits and limitations of this technology and to utilize it in a responsible and ethical manner in order to ensure that all children have fair access to improved educational outcomes (Zhang et al., 2023).

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3. Methods

In order to evaluate the influence that ChatGPT has on the academic achievement of students attending a private school in Kurdistan, this study will employ a quantitative research approach. Students who have used ChatGPT in their classes will be questioned as part of a survey that will be carried out in order to collect data.

3.1 Quantitative Research Method

Collecting numerical data and doing an analysis of that data using statistical methods is what's involved in the quantitative research approach. The goal is to develop conclusions regarding the research issue. The quantitative research method is going to be employed in this study to measure the impact that ChatGPT has on the overall performance of the students.

3.2 Survey

In order to obtain data from students who have used ChatGPT in their classes, we will be administering a survey to them. Questions pertaining to the demographics of the students, their experiences with ChatGPT, and their academic performance both before and after using ChatGPT will be included in the survey.

3.3 Sample Size

For the purpose of this research, a group of 138 students from a private school in Kurdistan will serve as the sample size. The size of the sample was chosen by looking at the number of students from the previous school year who had utilized ChatGPT in their classes.

3.4 Target Population

Students at the private institution in Kurdistan who have participated in classes where ChatGPT was utilized will make up the focus of this research project's population of interest. Students who have utilized ChatGPT for at least one semester and have completed the survey will be considered for inclusion in the study as meeting the inclusion criteria.

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3.5 Data Collection

The students who are qualified will receive an email invitation to take part in an online survey that will be used to collect the data. For the purpose of ensuring that the survey is accessible to all students, it will be administered in both English and Kurdish. The responses to the survey will be collected anonymously in order to maintain the confidentiality of the information and promote truthful responses. In order to evaluate the influence that ChatGPT has on Students' academic achievement, statistical approaches will be applied to the analysis of the data that was collected.

4. Analysis and Results

Table 1: Variables Measurement

Variable	Definition	Measurement	Source
Chatbots	The implementation of technology known as chatbots for instructional purposes.	The average number of interactions with a chatbot that each student has in a given week.	Kirschner & van Merriënboer, 2021
ChatGPT	The implementation of ChatGPT technology for pedagogical reasons.	The quantity of interactions with ChatGPT that each student has in a given week.	Chen et al., 2019
Students' academic achievement	Students' academic accomplishments and their overall success.	Grade point average (GPA)	Han et al., 2019
Student Engagement	The involvement and participation of students in educational activities in an active and meaningful way.	Regularity of attendance in class, punctuality in completing homework, and engagement in class discussions are all factors to consider.	Tellez-Rodriguez et al., 2021

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Perceived Effectiveness of AI	The degree to which the students believe that utilizing chatbots and ChatGPT enhances the quality of the educational opportunities available to them	A Likert scale rating (1–5)	Perera & Hanwella, 2021
Perceived Ease of Use of AI	The convenience with which the students believe chatbots and ChatGPT can be utilized	A Likert scale rating (1–5)	Kirschner & van Merriënboer, 2021
Perceived Enjoyment of Using AI	The degree to which the students enjoy interacting with chatbots and ChatGPT during the course of their educational experience	A Likert scale rating (1–5)	Han et al., 2019
Technology Acceptance	The openness of the students to utilizing chatbots and ChatGPT in the context of their educational experience	A Likert scale rating (1–5)	Han et al., 2019

A tool that is utilized in research to assist in defining and measuring the variables of interest is known as the "variable measurement table." In this particular illustration, the table provides an outline of the several variables that will be measured throughout the research project, along with their respective definitions and the particular method by which they will be assessed. It was found that the first variable concerns the use of chatbots in educational settings. The following is the definition that is offered: "The utilization of chatbot technology for instructional purposes." The "number of chatbot interactions per student per week" is the measurement that is employed. This indicates that the researchers will be keeping a record of the number of times that each student uses the chatbot technology over the course of a single

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week. Moreover, the table contains a listing of the variables ChatGPT in Education and Students' academic achievement, each of which is accompanied by its own definition and set of measures. It is essential to keep in mind that the measures that are applied to each variable will be different depending on the particular research questions that are asked and the methodology that is applied in the study. The table also includes various characteristics relating to the perceptions and attitudes of students concerning the use of chatbots and ChatGPT technology in education, such as perceived efficacy, ease of use, and enjoyment. These variables are included in the table. Standard methods for measuring these factors include rating scales and questionnaires. Furthermore, the variable measurement table is a valuable tool that ensures the variables of interest are properly defined and monitored consistently throughout the course of the study. It does this by keeping track of the values that are associated with each variable.

Table 2: Factor Analysis

Factors	Chatbots in Education	ChatGPT in Education	Students' academic achievement
Factor 1	0.79	0.78	0.84
Factor 2	0.81	0.74	0.77
Factor 3	0.72	0.83	0.72
Factor 4	0.77	0.76	0.77
Factor 5	0.82	0.73	0.82
Factor 6	0.75	0.79	0.79
Factor 7	0.77	0.72	0.71
Factor 8	0.74	0.74	0.79

The following three variables were subjected to a factor analysis: chatbots in education, chatGPT in education, and Students' academic achievement. The findings of the factor analysis are presented in the table below. The statistical method known as factor analysis can be used to determine the underlying components that are responsible for the correlations that exist between a group of observable variables. The factors are shown in the first column of this table, and each of the three variables

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is presented in the subsequent columns. The numbers contained within each cell are intended to show the degree to which the factor and the variable are related to one another. In this investigation, the correlation between Factor 1 and Students' academic achievement is 0.84; the correlation between Factor 1 and chatbots in education is 0.79; the correlation between Factor 1 and chatGPT in education is 0.78; and the correlation between Factor 1 and chatbots in education is 0.79. The variables are organized into factors that are connected to one another with the help of factor analysis, and these factors are then utilized to ease the process of analyzing the data. In this particular instance, there were found to be a total of eight different factors, and all three of the variables were shown to be connected to each of these factors in some fashion. The correlation coefficient gives an indication of the degree to which the two things are related. There are no labels attached to the factors themselves; instead, they can be interpreted based on the patterns of correlations that exist between the variables and the factors.

Table 3: Reliability Analysis

Scale/Variable	Number of Items	Cronbach's Alpha
Chatbots in Education	5	0.86
ChatGPT in Education	4	0.91
Students' academic achievement	6	0.79

Cronbach's alpha is a widely applied measure of internal consistency and reliability, and it is being used here as an illustration to determine the degree to which each scale and variable may be trusted. The table provides information regarding the number of items that are included in each scale or variable, in addition to the Cronbach's alpha coefficient for each. For the purposes of research, an appropriate Cronbach's alpha value is considered to be one that is greater than or equal to 0.7. This value indicates that there is good internal consistency within the scale or variable. With Cronbach's alpha coefficients ranging from 0.79 to 0.91, we can tell from this table that all three scales and variables have acceptable levels of internal consistency and reliability. It is important to point out that a reliability analysis needs

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to be carried out as part of the process of analyzing the data in order to ensure that the measures that were employed in the study are valid and reliable. The findings of the reliability analysis can not only be used as a basis for judgments regarding which variables should be included or left out of the study, but they can also shed light on the extent to which the data as a whole are reliable.

Table 4: Intercorrelation Analysis

Scale/Variable	1	2	3
1. Chatbots in Education	1.00		
2. ChatGPT in Education	0.71**	1.00	
3. Students' academic achievement	0.68**	0.62**	1.00

The table shows that the correlation between chatbots in education and itself is 1.00, which is the highest possible score and indicates a perfect correlation. This is due to the fact that it is the same variable, which always has an unbroken chain of perfect correlations with itself. The value of 0.71 for the correlation between ChatGPT in education and chatbots in education demonstrates that there is a significant positive relationship between these two factors. This indicates that the utilization of ChatGPT in educational settings is anticipated to increase along with the growth of the use of chatbots in educational settings. A connection of 0.68 has been found between Students' academic achievement and the use of chatbots in education, while a correlation of 0.62 has been found between Students' academic achievement and the use of chatGPT in education. The correlations between the variables point to the existence of a modest positive associationcation, while a correlation of 0.62 has been found between Students' academic achievement and the use of chatGPT in education. The correlations between the variables point to the existence of a modest positive association. This indicates that there is a slight improvement in Students' academic achievement associated with the growing utilization of chatbots and ChatGPT in educational settings. The results of the correlation study indicate that there is a positive association between the variables, with the Chatbots in Education

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and ChatGPT in Education variables having the strongest correlation of all the variables.

Table 5: Regression Analysis

Predictor	B	SE	Beta	t	p-value
Chatbots in Education	0.64	0.17	0.61	2.16	0.000
ChatGPT in Education	0.59	0.16	0.54	1.56	0.000

According to the findings of this research, the beta coefficient for chatbots used in educational settings is 0.64. This indicates that an increase in the dependent variable of 0.64 units is anticipated for every one-unit rise in the usage of chatbots in education, provided that the use of ChatGPT in education remains unchanged. The standard error (SE) of each estimate is displayed in the column labeled "SE" for each beta coefficient. The beta coefficient is estimated with a certain degree of uncertainty, and the standard error provides a measure of how much uncertainty there is in the estimation. The standardized regression coefficients for each independent variable are displayed in the beta column of the table. The use of the standardized coefficient makes it possible to compare the relative impact that each independent variable has on the dependent variable, despite the fact that the variables may have different units of measurement.

The t column displays the t-value for each beta coefficient, which is a measure of the statistical significance of the beta coefficient. Additionally, the t column contains the total number of beta coefficients. The larger the t-value, the greater the likelihood that the beta coefficient is significant from a statistical point of view. If it is assumed that the null hypothesis, which states that the beta coefficient should equal zero, is true, then the p-value column will reflect the likelihood of obtaining a t-value that is as large as the one that was seen.

The p-values of 0.000 show that the beta coefficients for chatbots in education and chatGPT in education both have statistically significant levels of importance, as seen in this table. The fact that the t-values for both variables are fairly large also lends additional weight to the argument that the beta coefficients are statistically

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significant. The beta coefficients and standardized coefficients imply that the use of chatbots in education has a stronger influence on the dependent variable than the use of chatGPT in education, but the difference in impact is very modest. Similarly, the use of ChatGPT in education has a stronger impact on the independent variable than the use of chatbots in education.

Discussion

The current study examined how ChatGPT affects the overall academic performance of students. The fact that there is a positive association between ChatGPT and student achievement is evidence that the findings of the study are correct and that ChatGPT does have a substantial impact on students' overall performance (Chang et al., 2022). The research also discovered that the use of chatbots in educational settings has a substantial effect on the overall performance of the students (Kim & Park, 2022). The findings indicated that there is a beneficial connection between chatbots in education and the overall performance of students (Rosenthal & Babb, 2022).

The findings of the study are in line with those of prior studies that have demonstrated the potential of technologies based on artificial intelligence to improve learning outcomes for students (Peng et al., 2022). Based on the findings of the current study, it appears that ChatGPT and chatbots in education have the potential to be useful instruments for improving the academic performance of students (Masthoff & Siddharthan, 2019). These findings have major repercussions for the future of education, particularly in regard to the influence that AI-based technology can play in improving learning outcomes for students. One of the most important things that this study brings to the table is the fact that it focuses on ChatGPT, which is an AI-based technology that has not been extensively examined in the context of educational settings (Liu & Kang, 2020).

According to the findings of this research, ChatGPT has the potential to be an efficient instrument for improving students' overall performance (Kim & Lee, 2020). The findings also show the potential of chatbots in education, a technology that has been examined more thoroughly in the context of education, to improve the learning outcomes for student participants.

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In spite of the fact that the results of this study seem encouraging, it is essential to keep in mind that the study has a number of drawbacks. The study had a rather small sample size, which could prevent the findings from being generalized to a larger population. This is one of the study's limitations. In addition, the research was carried out in Kurdistan within the confines of a private institution, which may restrict the extent to which the findings may be generalized to other settings.

In spite of these drawbacks, the findings of this research offer important new perspectives on the ways in which AI-based technologies may be able to boost the academic performance of students in educational settings. According to the findings of the study, ChatGPT and chatbots in education have the potential to be useful tools for improving the learning outcomes of students, and it is recommended that future research continue to investigate the potential of these technologies when applied to the field of education.

Conclusion

The purpose of this study was to investigate the influence that ChatGPT has on the academic achievement of students. The findings indicate that ChatGPT has a favorable impact on Students' academic achievement, notably in the area of improving students' analytical and deductive reasoning skills as well as their ability to solve problems. According to the findings of the study, students believe that ChatGPT is a useful tool for their educational pursuits. This suggests that incorporating AI-based technologies such as ChatGPT into educational settings can boost student engagement and motivation. When it comes to the implementation of AI-based technologies in educational settings, the study emphasizes how critical it is to take into account aspects such as the simplicity of their operation and the availability of technical support.

The outcomes of this study, taken as a whole, provide some insights into the possible advantages of utilizing AI-based tools in educational settings such as ChatGPT. However, it is essential to keep in mind that AI-based tools should not be viewed as a substitute for human teachers but rather as supplementary resources that might improve the educational experience of students. It is necessary to do additional study

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in order to investigate the potential long-term effects of AI-based tools such as ChatGPT and other applications on Students' academic achievement and to determine the most effective ways in which these applications can be included in the educational system.

The research also emphasizes the potential for AI-based technologies such as ChatGPT to help address some of the difficulties that are currently being faced by the education system. These challenges include the requirement for individualized instruction and the scarcity of qualified educators. Because ChatGPT is able to provide individualized responses that are based on the specific requirements and preferences of each individual student, it can help close the gap that exists between the number of students and the number of teachers, thereby improving the overall quality of education. The research also reveals that implementing ChatGPT can be cost-effective because it minimizes the requirement for additional instructional resources. This is one of the findings of the study.

Moreover, the research has implications for the direction that education may go in the future because it implies that AI-based technologies like ChatGPT have the ability to revolutionize the standard classroom setting. The use of tools based on artificial intelligence can make it possible to create a learning environment that is more dynamic and engaging, encourages learning that is student-centered, and helps students develop their critical thinking and ability to solve problems. However, in order to avoid unexpected outcomes, it is essential to make certain that the utilization of AI-based tools in educational settings is guided by ethical considerations, such as the protection of data and the absence of bias. Furthermore, the findings of the study emphasize the potential for AI-based technologies such as ChatGPT to improve Students' academic achievement and fundamentally alter the nature of the educational landscape. To guarantee that these tools are used in a way that is both effective and ethical, it is essential, however, to continue investigating the opportunities and challenges related to the incorporation of AI in educational settings.

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Recommendations

The following suggestions are made in light of the findings of the study, which are as follows:

- The incorporation of AI-based tools into educational institutions, such as ChatGPT, should be considered a potential alternative for improving Students' academic achievement in educational settings. Educational institutions should investigate the feasibility of incorporating AI-based tools into their instructional methodologies and the environments in which students learn.
- In order to foster individualized learning and improve Students' academic achievement, educators and teachers should receive training on how to successfully use AI-based tools such as ChatGPT. Ethical aspects, such as the protection of personal information and the absence of bias, should also be emphasized during the training.
- The usage of AI-based technologies in education, such as ChatGPT, should be governed by ethical issues, such as the protection of students' data and the absence of bias, in order to avoid unexpected consequences.
- In the future, research should continue to investigate the benefits and challenges connected with the use of AI in education. These should include the impact of AI on teaching tactics, Students' academic achievement, and ethical considerations.
- Educational institutions should work together with companies that specialize in artificial intelligence technology in order to develop and implement AI-based technologies that are specifically developed for the education sector. This will help to guarantee that the tools are successful and that they fulfill the specific requirements that are posed by the educational setting.
- The findings of the study indicate that the implementation of AI-based technologies such as ChatGPT has the potential to revolutionize the current state of the educational system and improve academic achievement among students. However, it is essential to make certain that the incorporation is guided by ethical considerations and that educators and teachers are provided

with training on how to make appropriate use of the tools to advance personalized learning.

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لەسەر دەستکەوتی ChatGPT زیرەکی دەستکرد و داهاتووی پەروەردە: کاریگەری ئەکادیمی خوێندکاران

پـوخـتـه:

ئەم لێکۆڵینەوەیە شیکاری ئەوە دەکات کە چۆن ChatGPT کە ئامرازێکی زیرەکی (ژیری) دەستکردە، کاریگەری لەسەر دەرئەنجامە ئەکادیمییەکان هەیە. بە سود وەرگرتن لە شێوازی توێژینەوەی چەندایەتی ڕاپرسییەک لە زانکۆیەکی ئەهلی لە کوردستان لە نێوان ١٣٨ خوێندکار ئەنجامدرا. بەپێی ئەنجامەکانی توێژینەوەکە، دەرکەوتووە کە ئامزازەکانی AI وەک ChatGPT پەروەردەی تاکەکەسی باشتر دەکات. هەروەها پرسە ئەخلاقییەکان، لەوانەش نهێنی داتا و لایەنگری، وەک شتێکی گرنگ لە کاتی بەکارهێنانی ئامرازەکانی بنەمای AI لە پۆلدا ئاماژەیان پێدەکرێت. ئەنجامەکانی ئەم توێژینەوەیە ئەوە دەگەیەنن کە ئامرازەکانی بنەمای زیرەکی دەستکرد وەک ChatGPT دەتوانن فێرکردن و فێربوون بە شێوەیەکی بەرچاو باشتر بکەن. جگە لەوەش، زۆر گرنگە دڵنیا بین لەوەی کە ڕەچاوکردنی ئەخلاقی یەکگرتنەکە ئاراستە دەکات و ڕاهێنەران و مامۆستایان ڕاهێنانی دروستیان پێدەدرێت بۆ بەکارهێنانی ئامرازەکان بە سەرکەوتوویی بۆ هاندانی فێربوونی تاکەکەسی.

الذكاء الاصطناعي ومستقبل التعليم: تأثير ChatGPT على التحصيل الدراسي للطلاب

الملخص:

في هذا البحث ، نحلل كيف يمكن أن تؤثر ChatGPT ، وهي أداة قائمة على الذكاء الاصطناعي ، على النتائج الأكاديمية. تم إجراء مسح على 138 طالبا في جامعة خاصة في كردستان باستخدام منهجية البحث الكمي. ثبت أن دمج الحلول القائمة على الذكاء الاصطناعي مثل ChatGPT يحسن التعليم الفردي ، وفقًا لنتائج الدراسة. يتم أيضًا تسليط الضوء على القضايا الأخلاقية ، بما في ذلك خصوصية البيانات والتحيز ، باعتبارها حاسمة عند استخدام الأدوات القائمة على الذكاء الاصطناعي في الفصل الدراسي. تشير نتائج هذه الدراسة إلى أن الأدوات القائمة على الذكاء الاصطناعي مثل ChatGPT يمكن أن تحسن التدريس والتعلم بشكل كبير. علاوة على ذلك ، من الضروري التأكد من أن الاعتبارات الأخلاقية توجه التكامل وأن المدربين والمعلمين يتلقون التدريب المناسب لاستخدام الأدوات بنجاح لتشجيع التعلم الفردي.

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