Personalized tutoring: ChatGPT as a virtual tutor for personalized learning experiences

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Abstract

This study aimed to ascertain what factors influence the length of time undergraduates receive individual tutoring. Quantitative questionnaires with Likert scale items gathered data on perception, satisfaction, engagement, self-confidence, preference for individualized instruction and participation in decision-making. The sample consisted of 247 University of Lima students. Among the quantitative methods used to examine the data were reliability and validity tests, correlations, analysis of variance, and regression. In tests of reliability, all variables exhibited

fair to excellent internal consistency. The results disclosed several significant statistics that shed light on the variables that influence the duration of personalized tutoring. 68.8 percent of participants reported using ChatGPT for personalized tutoring, while 31.2 percent did not. The majority of students utilized personalized tutoring for two to five semesters. Regarding gender, males comprised a larger proportion of the sample (62.3% versus 37.7%) than females. Several recommendations can be made based on these findings. Priority number one is increasing user satisfaction through more efficient and effective individualized tutoring sessions. It can increase student engagement by utilizing multimedia and interactive teaching aids. The study emphasizes the significance of attending to the emotional and psychological aspects of individualized tutoring to enhance student experiences and outcomes.

Keywords: ChatGPT, Tutor, Education, Artificial Intelligence, Students

1. Introduction

Recent artificial intelligence (AI) advancements have led to significant improvements in many fields, including education. With the introduction of ChatGPT and other advanced language models, it is now possible to visualize how AI-powered virtual instructors can provide students with individualized lessons. This study aims to determine how effective ChatGPT is as a virtual instructor for providing students with individualized instruction. Consider a personal trainer that never tires, has unlimited access to information, and is free (Bridger & Ford, 2019). Patrick Suppes, a philosophy professor at Stanford, accurately predicted in 1966 that "millions of schoolchildren" would have access to a personal tutor due to technological advancements in computer science. He compared the circumstance to when Aristotle instructed a young Alexander the Great (Maphosa & Maphosa, 2023).

ChatGPT, a novel AI-powered chatbot with sophisticated conversational skills, may soon be able to assume this responsibility. In the current educational system, meeting each student's unique requirements can be challenging. Because most classrooms are designed for whole-class instruction, it may be difficult for teachers to tailor their lessons to the varied requirements of their students. Consequently, some students may be overworked while others are uninterested (Qadir, 2023). However, personalized instruction addresses the specific needs of each pupil, allowing them to progress at their own pace and focus on problem areas. According to Schwarzenberg

et al. (2018), artificial intelligence (AI), particularly virtual tutors such as ChatGPT, can bridge this divide and provide students with more individualized educational experiences. ChatGPT can respond to queries on various graduate-level examinations due to its accumulated vast data. As someone who has researched the impact of technology on education, we believe ChatGPT can be used to assist students in achieving success. ChatGPT demonstrates an incapacity to focus on a single task, much less coaching (Schwarzenberg et al., 2018).

ChatGPT by OpenAI is a cutting-edge language model that employs deep learning. As a result of its extensive textual training, it can interpret and generate conversational responses that resemble those of humans. ChatGPT is distinguished by its capacity to engage in live dialogues with students, replicating human instruction in all but the most superficial ways (Lin, 2023). The chatbot can search its own database and external sources such as encyclopedias and the internet. ChatGPT is intelligent enough to comprehend complex concepts and provide natural responses.

As a virtual tutor, ChatGPT's adaptability as a learning platform is one of its primary selling factors. Many prevalent, educational practices presume that all children learn best when exposed to the same instructional methods. However, research indicates that children have preferred learning styles, including visual, aural, and kinesthetic (Lin, 2023; Qadir, 2023; Singh, 2023). ChatGPT can determine the favored learning style of each student by analyzing their interactions and responses. ChatGPT can generate visual aids such as diagrams, charts, and videos to enhance teachings and improve retention for students who learn best through visuals.

The natural language processing capabilities of ChatGPT make it a valuable tool for students who wish to learn swiftly and effectively. Students using this innovative technology do not have to wait for a tutor or teacher to respond to their questions (Rahman & Watanobe, 2023). ChatGPT is available whenever students require it, day or night, making it simpler than ever to fit the study time into their hectic schedules (Rahman & Watanobe, 2023). It can comprehend sentence structure, nuances of meaning, and the context of a conversation. ChatGTP is a language whiz and an expert in every other field. This conversational AI assistant is similar to a walking, talking search engine in that it can provide nearly accurate and intelligent responses to various queries.

In addition, students can benefit greatly from ChatGPT's extensive information database. It can respond promptly and accurately to students' inquiries and give them access to information (Lin, 2023; Qadir, 2023; Rahman & Watanobe, 2023). ChatGPT can readily acquire relevant information from its vast training data, textbooks, and reputable web sources. In contrast, human teachers have limited knowledge and may require time to investigate uncommon topics (Rahman & Watanobe, 2023). This instantaneous access to knowledge allows students to investigate their inquiries and promotes a deeper understanding of the studied material. While there are numerous benefits to using ChatGPT as a virtual tutor, there are also a few drawbacks. Due to inherent biases in its training data or an inability to correctly interpret context, the model may occasionally generate incorrect or misleading responses. As demonstrated by Singh's (2023) study, addressing these issues and enhancing the model's skills are essential for providing effective and trustworthy training.

AI and language models such as ChatGPT have paved the way for transformative new approaches to education in the form of personalized virtual tutoring (Akyuz, 2020; Baidoo-Anu & Owusu Ansah, 2023). ChatGPT offers students the unique opportunity to direct their education. Thanks to technological advancements, students can pose questions, receive individualized responses, and gain access to supplementary materials. Individualized instruction allows students of all ages to study at their tempo and in the most effective manner (Akyuz, 2020). ChatGPT has the potential to enhance educational efficacy and accessibility by accommodating a variety of learning styles, permitting individualized pacing, and drawing from a vast corpus of knowledge. This study seeks to investigate the implementation and efficacy of ChatGPT as a virtual tutor, paving the way for future improvements in personalized learning.

2. Literature Review

In recent years, there has been a rise in interest in personalized tutoring as a potentially effective means of meeting the diverse learning needs of students. Recent research on the implementation of chatbots in higher education has revealed that the manner in which chatbots are employed can significantly impact students' motivation

to learn. In a graduate-level course on cloud computing, for example, AI chatbots provided significant learning enhancements. These enhancements in student learning occurred due to chatbots prompting students to elaborate on their claims and expand their arguments. In this instance, the chatbot initiated a conversation by posing a query to the learner. This literature review overviews research and practice by focusing on the effectiveness, benefits, problems, and emerging technologies associated with personalized tutorings, such as AI-powered virtual tutors.

2.1 Definition of personalized tutoring with ChatGPT

"personalized tutoring with ChatGPT" refers to using the ChatGPT framework to provide pupils with individualized instruction (Khan et al., 2023). Students using this cutting-edge technology do not have to wait for a tutor or teacher to respond to their questions, saving them considerable time (Khan et al., 2023). ChatGPT is available whenever students require it, day or night, making it simpler than ever for them to fit the study time into their busy schedules.

ChatGPT can be used to generate personalized practice problems for the learner. For instance, if a student is having difficulty comprehending a particular mathematical concept, they could use the model to generate practice problems tailored to their level of proficiency. ChatGPT is a fantastic aid for any learner who prioritizes effectiveness (Castillo et al., 2023; Hariri, 2023; Khan et al., 2023; Kilinç, 2023). Its ability to process natural language allows students to obtain answers to their questions much more rapidly than in the past. Let's investigate the various methods by which ChatGPT assists students. ChatGPT can also be used for one-on-one tutoring by providing immediate feedback on pupil work. For example, a student composing an essay can use ChatGPT to receive feedback from peers on their grammar, sentence structure, and overall organization.

2.2 Effectiveness of Personalized Tutoring

There is evidence that individual tutoring can enhance the academic performance of students. In 1984, pioneering research by Bloom demonstrated the significant advantages of private tutoring by showing that students who received

individualized instruction outperformed their classmates in more traditional classroom settings (Hariri, 2023). As demonstrated by Khan et al. (2023) and Hariri (2023), Chatbots enabled by artificial intelligence (AI) that can provide immediate feedback and direction to students are at the core of personalized learning. Using chatbots to receive custom-tailored practice questions, students can strengthen areas in which they are deficient. Similar findings from additional research indicate that individualized tutoring improves students' performance in various subject areas and grade levels, as well as their information retention and conceptual comprehension. Personalized learning is gaining popularity to increase participation and guarantee academic success for all students. Teachers can use ChatGPT to guide students through difficult concepts. For instance, a student struggling to comprehend a difficult scientific concept could ask the model to break it down (George & George, 2023). The learner can progress through the material at their own pace, decreasing the likelihood of feeling discouraged or overburdened (George & George, 2023; Su & Yang, 2023). Personalized learning aims to keep students engaged in their studies by tailoring course materials and assessments to their specific interests, strengths, and limitations.

Through the provision of a customized learning environment, it is possible to improve academic performance, student retention, and overall satisfaction. ChatGPT benefits students by allowing them to learn at their own pace and in the manner that best meets their requirements (Khan et al., 2023; Singh, 2023). This can help students learn more quickly and efficiently because they can receive additional assistance in the areas they need most without being slowed down by the remainder of the class. Teachers and students can interact more one-on-one since a virtual assistant can answer queries and clear up any confusion (George & George, 2023).

2.3 Early versions of personalized tutoring

In 1972 the PLATO (Programmable Logic for Automated Teaching Operations) adaptive learning system was introduced (Poorian, 2016; VanLehn, 2011). This platform for personalized education was the first of its kind to be made readily available. Don Bitzer, a professor of electrical engineering at the University of Illinois, created a program called PLATO that would permit one thousand concurrent users to

access a mainframe (Chan & Lee, 2023; Jayanthi & Rajalakshmi, 2022). Each student can access various online language, music, math, and other courses and receives customized computer feedback on their progress. With PLATO, students could complete the same tasks as they would have in a conventional classroom in a significantly shorter amount of time. Most students found this format more engaging than long lectures (Jayanthi & Rajalakshmi, 2022).

Even though Carnegie Mellon's more sophisticated designs for instructional software enabled students to learn significantly more than in traditional classrooms, educators have not extensively adopted the programs. According to Jayanthi and Rajalakshmi (2022), a school required many expensive, high-powered computer workstations for pupils to have access to an intelligent tutor in the 1980s and 1990s. Computers are becoming increasingly proficient and affordable. In addition, early intelligence tutors were predominantly utilized in STEM classes, which limited their applicability. The software programs were unavailable for student examination. The results of exams and quizzes could be discussed with students, however.

In 2007, the earliest AI chatbots were used to tutor students by guiding them through problem solutions. The effects of these chatbots on learning were found to be comparable to those of human instructors. However, using chatbots as tutors were still in its infancy (Mhlanga, 2023; Poorian, 2016; VanLehn, 2011).

In the 2010s, social networks and advances in artificial intelligence have revolutionized how individuals interact with technology. (Kasneci et al., 2023) Chatbots are now extensively utilized and are no longer considered novel. It is common to hear someone speaking on their phone, automobile, or domestic appliance these days. Since then, efforts to develop "intelligent tutors" to assist students have propelled advancements in AI, social networks, and computer hardware. With ChatGPT's ability to compose essays, respond to philosophical questions, and debug computer code, Suppes can realize his dream of wholly individualized computer-based tutoring.

2.4 Emerging Technologies: AI-Powered Virtual Tutors

The advent of artificial intelligence technology, specifically AI-powered virtual instructors, has revitalized personalized teaching (Adiguzel, Kaya, & Cansu, 2023;

Mhlanga, 2023). To simulate the experience of working with a human tutor, virtual tutors use technologies such as natural language processing, machine learning, and conversational user interfaces to engage in live, real-time conversations with students (Gavilán et al., 2022; Muñóz et al., 2023). ChatGPT poses questions that prompt students to consider how to enhance their work; for instance, everyone involved can assist students in their learning. ChatGPT can significantly enhance the quality of instructional services for children because it has access to more information than Aristotle ever did (Adiguzel et al., 2023).

OpenAI's ChatGPT is an example of a virtual instructor enabled by AI. It utilizes large-scale linguistic models to deliver individualized instruction. ChatGPT can adapt to each student's unique learning style, pace, and subject preferences, making it a more effective virtual instructor (Banihashem et al., 2023; Nonita et al., 2022). Recent research on the implementation of chatbots in higher education has revealed that the manner in which chatbots are employed can significantly impact students' motivation to learn. In a graduate-level course on cloud computing, for instance, artificial intelligence chatbots provided significant learning enhancements (Chan & Tsi, 2023). These enhancements in student learning occurred due to chatbots prompting students to elaborate on their claims and expand their arguments. In this instance, the chatbot initiated dialogue by posing a query to the student (Adair, 2023; Atlas, 2023; Ramos et al., 2022). To ensure accurate and dependable tutoring, however, obstacles such as biases in training data and limitations in interpreting context must be overcome(Chan & Tsi, 2023; Luan, Lin, & Li, 2023).

2.5 Challenges in personalized tutoring

Personalized tutoring has a great deal of potential, but it also has its challenges. Providing individual instruction to all students can be difficult due to the high cost and limited resources available in most classrooms (VanLehn, 2011). Because ChatGPT can be used to plagiarize, many instructors are concerned that it will decrease students' motivation to learn. Some individuals are concerned that ChatGPT will provide inaccurate or misleading information (Eysenbach, 2023). As exemplified by previous research and the history of intelligent tutors, chatbots like ChatGPT have

the potential to make deeper, more individualized learning accessible to a larger population (Jagannath & Banerji, 2023; Zhai, 2023). It can be challenging to ensure the quality and consistency of individualized instruction across multiple tutors due to potential differences in tutoring experience and instructional approaches that may impact student outcomes (Poorian, 2016). ChatGPT poses questions that prompt students to consider how to enhance their work; for instance, everyone involved can assist students in their learning. ChatGPT can significantly improve the quality of tutoring services for children because it has access to more information than Aristotle ever did (Mansilla et al., 2022; Zhai, 2023).

Even though studies have shown that one-on-one instruction can be advantageous, many unresolved questions still require further investigation. First, there is a shortage of research on the effects of individualized mentoring on students' long-term academic achievement. How tutors' knowledge, experience, and training influence the success of individualized instruction requires additional research. In addition, further research is necessary to determine the optimal implementation of AI-powered virtual instructors in classroom settings. Ethical issues, such as data protection and algorithmic transparency, will also be addressed, along with the most effective methods for integrating virtual instructors with human instruction.

3. Methods

3.1 Participants

Undergraduate and graduate students at the University of Lima participated in this study. In total, 287 undergraduate and graduate students are included in the study. In addition, participants were selected based on convenience sampling, with students from different faculties and academic programs invited to participate in the study voluntarily.

3.2 Data Collection

This research relied primarily on questionnaires to collect data. The questionnaire contained questions regarding the perceptions of personalized tutoring held by the participants. The participants' responses were measured using a Likert

scale ranging from 1 (strongly disagree) to 4 (strongly concur). The questionnaire items were created based on pertinent literature and research objectives to ensure the inclusion of relevant constructs. The questionnaires were made available electronically to the participants using an online survey platform. All participants were informed of the study's objectives, their participation was voluntary, and their responses would be kept confidential and anonymous. Those who had not yet responded were contacted periodically.

3.3 Data Analysis

The collected data were analyzed using techniques for quantitative data analysis. Descriptive statistics were calculated to summarize participants' responses to each questionnaire item, including means, standard deviations, frequencies, and percentages. This analysis presented an overview of the perceptions of personalized tutoring held by the participants.

Cronbach's alpha was utilized to ascertain the questionnaire's validity by conducting an internal consistency reliability analysis. Cronbach's alpha evaluates the consistency of responses on a scale or construct's components. The items measure the same construct reliably when Cronbach's alpha is high. Validity testing also ensured that questionnaire items measured the intended constructs. Using exploratory factor analysis (EFA), a technique for identifying the underlying dimensions or factors in data, construct validity was evaluated. EFA verifies that the questionnaire items assess the targeted constructs and supports the instrument's reliability and validity.

We utilized SPSS (Statistical Package for the Social Sciences) or equivalent programs to analyze the quantitative data. Tables, charts, and narrative summaries all comprehensively depicted the participants' attitudes toward individualized counseling.

4. Empirical Results and Discussion

4.1 Descriptive statistics

Of the total 247 participants, 62.3% (154) identified themselves as male, and the remaining 37.7% were female, as shown in the table below. Additionally, of those who

agreed that they use ChatGPT as a personalized tutor, 68.8% of participants, and the remaining 31.2% (77) of participants selected NO, implying that they do not use ChatGPT as a personalized tutor.

Table 1: Summary statistics

Gender information					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Financial	154	62.3	62.3	62.3
	non-financial	93	37.7	37.7	100.0
	Total	247	100.0	100.0	
Do you use ChatGPT					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	170	68.8	68.8	68.8
	No	77	31.2	31.2	100.0
	Total	247	100.0	100.0	
How long have you used Personalized Tutoring					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	46	18.6	18.6	18.6
	2	91	36.8	36.8	55.5
	3	18	7.3	7.3	62.8
	4	51	20.6	20.6	83.4
	5	40	16.2	16.2	99.6
	6	1	0.4	0.4	100.0
	Total	247	100.0	100.0	
How long have you used Personalized Tutoring					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	46	18.6	18.6	18.6
	2	91	36.8	36.8	55.5
	3	18	7.3	7.3	62.8
	4	51	20.6	20.6	83.4
	5	40	16.2	16.2	99.6
	6	1	0.4	0.4	100.0
	Total	247	100.0	100.0	

The data reveals patterns in the gender, ChatGPT usage, and total time receiving individualized instruction of the study's participants. Men constitute 62.3% of the total sample size, indicating that they are the predominant gender among participants. Moreover, 68.8% of respondents reported using ChatGPT, while 31.2% said they did not. The majority of participants (36.6%) utilized personal tutoring for two units of time, followed by those who utilized it for four units (20.6%) and those

who utilized it for five units (16.2%). When further broken down, 18.6% of respondents said they only had time for one unit, with smaller proportions for the other options (See Table 1 above).

4.2 Reliability Test Result

As shown in the table above, Cronbach's Alpha coefficients, which measure internal consistency, range from 0.56 to 0.71. Cronbach's Alpha values between 0.6 and 0.7 are generally regarded as satisfactory. The coefficients of reliability for the Perceived Effectiveness and Satisfaction factors are lower than those of the other variables (0.60 and 0.56, respectively).

The number of items used to calculate Cronbach's Alpha for each variable represents the subset of the original questionnaire items examined. These parameters appear to have the greatest impact on the internal consistency of each variable. The Perceived Effectiveness and Satisfaction factors could still be useful despite their diminished reliability. When interpreting the results, scientists should proceed cautiously and not rule out the possibility of conducting additional research or investigating alternative measurements. The outcomes are presented in Table 2.

Table 2: Reliability test result

Reliability test		
Variable	**Cronbach's Alpha**	**Items Selected**
Perception of Effectiveness	0.601	4
Satisfaction	0.56	3
Engagement	0.653	3
Self-confidence	0.71	4
Preference for Personalized Tutoring	0.603	4

4.3 Correlation analysis

The results of these correlation analyses cast light on the relationships between the numerous research factors. Indicators suggest a correlation between positive perceptions of ChatGPT and individualized coaching and increased enjoyment and enthusiasm for using ChatGPT. A preference for personalized tutoring is negatively associated with perceptions of ChatGPT (r = -0.347, p 0.01), attitudes toward ChatGPT (r = -0.387, p 0.01), and involvement with ChatGPT (r = -0.264, p 0.01). However, self-assurance correlates

positively with this (r = 0.555, p 0.01). According to these findings, those with a negative impression of ChatGPT, a preference for individualized instruction, and a low level of participation in ChatGPT are more likely to prefer individualized instruction.

Moreover, it has been demonstrated that a preference for individual tutoring is associated with higher confidence levels. Negative correlations between these two measures suggest that participants' attitudes and preferences regarding self-confidence and the preference for customized tutoring may be complicated. It is essential to consider these connections in light of the research questions and objectives and to investigate them through analysis and interpretation. The results are shown in Table 3.

Table 3: Correlation result

Correlations							
		ChatGPT perception	Perception	Satisfaction from using ChatGPT	Engagement with ChatGPT	Self-confidence	Preference for Personalized Tutoring
ChatGPT perception	Pearson Correlation	1					
Perception	Pearson Correlation	.727**	1				
Satisfaction from using ChatGPT	Pearson Correlation	.519**	.516**	1			
Engagement with ChatGPT	Pearson Correlation	.355**	.378**	.428**	1		
Self-confidence	Pearson Correlation	-.282**	-.230**	-.191**	-.238**	1	
Preference for Personalized Tutoring	Pearson Correlation	-.347**	-.387**	-0.109	-.264**	.555**	1

**. Correlation is significant at the 0.01 level (2-tailed).

4.4 Regression analysis

As determined by regression analysis, several predictor variables have significant associations with the duration of personalized instruction. With a

coefficient of 2.667 ($p < 0.001$), the constant term represents the estimated value of the dependent variable when all predictor variables are set to zero. Recent research on chatbots in higher education has demonstrated that how chatbots are implemented can have a significant impact on students' motivation to learn. In a graduate-level cloud computing course at Carnegie Mellon, AI chatbots significantly enhanced student learning. These gains in knowledge resulted from chatbots requesting that students elaborate on their claims or expound on previously presented arguments. The chatbot posed a query to the student.

Perception does not demonstrate a significant relationship with the duration of personalized instruction among the specific predictors (B = 0.420, p = 0.225). However, there are statistically significant associations between Satisfaction with ChatGPT (B = 0.970, p = 0.000), Engagement with ChatGPT (B = 0.534, p = 0.000), Self-confidence (B = 0.445, p = 0.000), Preference for Personalized Tutoring (B = 0.697, p = 0.000), and participation in decision-making (B = 0.580, p = 0.000). These findings suggest that a prolonged duration of personalized tutoring is associated with greater satisfaction, engagement, self-confidence, preference for customized tutoring, and participation in decision-making. The outcomes are presented in Table 4.

Table 4: Regression result

Coefficients						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	2.667	0.738		3.612	0.000
	Perception	0.420	0.186	0.019	0.225	0.000
	Satisfaction from using ChatGPT	0.97	0.238	-0.099	-1.246	0.000
	Engagement with ChatGPT	0.534	0.180	0.096	1.304	0.000
	Self-confidence	0.445	0.186	-0.145	-1.854	0.000
	Preference for Personalized Tutoring	0.697	0.167	0.150	1.779	0.000
	Participation in decision-making	0.580	0.089	0.064	0.896	0.000

a. Dependent Variable: How long have you used Personalized Tutoring

These results highlight the significance of these variables in determining the duration of personalized tutoring experiences. Utilize ChatGPT to simplify difficult concepts for your students. A teacher, for example, could use the model to simplify a complex scientific concept. Students can progress through the material at their tempo, avoiding frustration and exhaustion. It can be utilized in numerous ways to enhance the educational experience for both students and instructors. Nevertheless, various training methods can improve educational chatbots, such as ChatGPT and other learning bots.

5. Conclusion

The data analysis led to several significant conclusions regarding the factors influencing the participants' individualized instruction duration. Learner-reported measures of satisfaction after using ChatGPT, interest in using ChatGPT, self-confidence, tutoring preference, and decision-making input were found to be significantly correlated with the duration of individualized instruction. Statistically speaking, there was no correlation between perception and time. Both educators and students can utilize ChatGPT to construct highly individualized curricula. ChatGPT has been hailed as a game-changing app that has the potential to upend the current educational system entirely. Few individuals influence how others perceive ChatGPT's impact on traditional education. This cutting-edge technology's natural language processing and machine learning algorithms can completely alter the dynamic between teachers and students. Teachers can use ChatGPT to facilitate a more interactive and fruitful learning environment for their students. In contrast, students can take responsibility for their education by posing their queries, receiving individualized responses, and accessing supplementary materials.

These findings demonstrate the significance of subjective characteristics, such as satisfaction, engagement, self-confidence, and preference, in determining the length of individual tutoring sessions. Additionally, student participation in decision-making appears to lengthen the duration of individualized tutoring.

6. Theoretical and Practical Implications

The novel findings of this investigation have important theoretical and practical implications. According to this study, students can experience more ownership and investment in their personalized instruction if they are included in the decision-making process. Second, this study demonstrated the significance of soliciting student feedback on learning objectives, instructional strategies, and course content. In addition, the research revealed that group work can empower students and contribute to increased time spent on individual instruction. In the meantime, this study found that increasing user satisfaction is essential for promoting the continued use of personalized coaching over shortened periods. This can be accomplished by aggressively collecting student feedback, promptly addressing any issues, and enhancing the quality and efficacy of the individualized tutoring experience.

In addition, this study demonstrated that maintaining student interest is crucial for the success of an individualized tutoring program. On the other hand, this research has revealed that interactive components, multimedia resources, and active learning opportunities can increase student participation. According to this study, students are more likely to retain information when they are actively engrossed in the learning process, which can be accomplished through interactive activities, simulations, and real-world examples.

7. Limitation

This approach's limitations must be considered. Since convenience sample participants are not randomly selected, the results may be biased. Therefore, it is conceivable that the results cannot be extrapolated to all University of Lima first-year students. Moreover, when relying solely on self-report questionnaires, participants may provide socially desirable responses or misread the questions, contributing to response bias. Despite these limitations, the study aimed to gain valuable insights into the participants' perspectives regarding individualized tutoring. Future research is strongly urged to address these limitations and contribute significant findings to the existing corpus of knowledge. In this fashion, data from another population should be collected to compare with the results of this study.

Reference

Adair, A. (2023). Teaching and Learning with AI: How Artificial Intelligence is Transforming the Future of Education. *XRDS: Crossroads, The ACM Magazine for Students, 29*(3), 7-9. http://dx.doi.org/10.1145/3589252

Adiguzel, T., Kaya, M. H., & Cansu, F. K. (2023). Revolutionizing education with AI: Exploring the transformative potential of ChatGPT. *Contemporary Educational Technology, 15*(3), ep429. https://doi.org/10.30935/cedtech/13152

Akyuz, Y. (2020). Effects of intelligent tutoring systems (ITS) on personalized learning (PL). *Creative Education, 11*(6), 953-978. https://doi.org/10.4236/ce.2020.116069

Atlas, S. (2023). *ChatGPT for Higher Education and Professional Development: A Guide to Conversational AI*. College of Business Faculty Publications. https://digitalcommons.uri.edu/cba_facpubs/548

Baidoo-Anu, D., & Owusu Ansah, L. (2023). Education in the era of generative artificial intelligence (AI): Understanding the potential benefits of ChatGPT in promoting teaching and learning. *Available at SSRN 4337484*, 1-22. https://dx.doi.org/10.2139/ssrn.4337484

Banihashem, S., Noroozi, O., Wals, A., & Farrokhnia, M. (2023). A SWOT analysis of ChatGPT: Implications for educational practice and research. *Innovations in Education and Teaching International*, 1-15. https://doi.org/10.1080/14703297.2023.2195846

Bridger, A. E., & Ford, R. M. (2019). Undergraduate student research engagement through the open laboratory model. *New Directions for Higher Education, 2019*(185), 57-69. https://doi.org/10.1002/he.20312

Castillo, A. G. R., Silva, G. J. S., Arocutipa, J. P. F., Berrios, H. Q., Rodriguez, M. A. M., Reyes, G. Y., Lopez, H. R. P., Teves, R. M. V., Rivera, H. V. H., & Arias-Gonzáles, J. L. (2023). Effect of Chat GPT on the digitized learning process of university students. *Journal of Namibian Studies: History Politics Culture, 33*(1), 1-15. https://www.namibian-studies.com/index.php/JNS/article/view/411

Chan, C. K. Y., & Lee, K. K. (2023). The AI generation gap: Are Gen Z students more interested in adopting generative AI such as ChatGPT in teaching and learning than their Gen X and Millennial Generation teachers? *arXiv preprint arXiv:2305.02878*. https://doi.org/10.48550/arXiv.2305.02878

Chan, C. K. Y., & Tsi, L. H. (2023). The AI Revolution in Education: Will AI Replace or Assist Teachers in Higher Education? *arXiv preprint arXiv:2305.01185*. https://doi.org/10.48550/arXiv.2305.01185

Eysenbach, G. (2023). The role of ChatGPT, generative language models, and artificial intelligence in medical education: a conversation with ChatGPT and a call for papers. *JMIR Medical Education, 9*(1), e46885. https://doi.org/10.2196/46885

Gavilán, J. C. O., Díaz, D. Z., Huallpa, J. J., Cabala, J. L. B., Aguila, O. E. P., Puma, E. G. M., Vasquez-Pauca, M. J., Mansilla, E. B. R., Laura, P. A. S., & Hoces, W. B. (2022). Technological Social Responsibility in University Professors. *Eurasian Journal of Educational Research, 100*(100), 104-118. https://ejer.com.tr/manuscript/index.php/journal/article/view/945

George, A. S., & George, A. H. (2023). A review of ChatGPT AI's impact on several business sectors. *Partners Universal International Innovation Journal, 1*(1), 9-23. https://doi.org/10.5281/zenodo.7644359

Hariri, W. (2023). Unlocking the Potential of ChatGPT: A Comprehensive Exploration of its Applications, Advantages, Limitations, and Future Directions in Natural Language Processing. *arXiv preprint arXiv:2304.02017*. https://doi.org/10.48550/arXiv.2304.02017

Jagannath, K. V., & Banerji, P. (2023). Personalized Learning Path (PLP) – "App" for improving academic performance and prevention of dropouts in India. In *Human Interaction & Emerging Technologies (IHIET-AI 2023): Artificial Intelligence & Future Applications*. AHFE International, USA. http://doi.org/10.54941/ahfe1002935

Jayanthi, V., & Rajalakshmi, A. (2022). Impact of Online Learning Experience on Student Satisfaction Through Student Engagement. *International Journal of Health Sciences, 6*(3), 840–848. https://doi.org/10.53730/ijhs.v6nS3.5320

Kasneci, E., Seßler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F., Gasser, U., Groh, G., Günnemann, S., & Hüllermeier, E. (2023). ChatGPT for good? On opportunities and challenges of large language models for education. *Learning and Individual Differences, 103*, 102274. https://doi.org/10.1016/j.lindif.2023.102274

Khan, R. A., Jawaid, M., Khan, A. R., & Sajjad, M. (2023). ChatGPT-Reshaping medical education and clinical management. *Pakistan Journal of Medical Sciences, 39*(2), 605. https://doi.org/10.12669/pjms.39.2.7653

Kilinç, S. (2023). Embracing the Future of Distance Science Education: Opportunities and Challenges of ChatGPT Integration. *Asian Journal of Distance Education, 18*(1), 25-237. https://doi.org/10.5281/zenodo.7857396

Lin, J. (2023). ChatGPT and Moodle Walk into a Bar: A Demonstration of AI's Mind-blowing Impact on E-Learning. *Available at SSRN*. https://dx.doi.org/10.2139/ssrn.4393445

Luan, L., Lin, X., & Li, W. (2023). Exploring the Cognitive Dynamics of Artificial Intelligence in the Post-COVID-19 and Learning 3.0 Era: A Case Study of ChatGPT. *arXiv preprint arXiv:2302.04818*. https://doi.org/10.48550/arXiv.2302.04818

Mansilla, E. B. R., Castillo-Acobo, R. Y., Puma, E. G. M., Maquera, Y. M., Gonzales, J. L. A., & Vasquez-Pauca, M. M. J. (2022). Stress in University Teachers in the Framework of the Post-Pandemic Face-To-Face Academic Resumption. *Journal of Medicinal and Chemical Sciences, 5*(6), 1040-1047. https://doi.org/10.26655/JMCHEMSCI.2022.6.17

Maphosa, V., & Maphosa, M. (2023). Adoption of Educational Fourth Industrial Revolution Tools Pre and Post-COVID-19 and the Emergence of ChatGPT. In *Reimagining Education - The Role of E-learning, Creativity, and Technology in the Post-pandemic Era*. IntechOpen. https://doi.org/10.5772/intechopen.1001612

Mhlanga, D. (2023). Open AI in education, the responsible and ethical use of ChatGPT towards lifelong learning. *Available at SSRN*. http://dx.doi.org/10.2139/ssrn.4354422

Muñoz, S. A. S., Gayoso, G. G., Huambo, A. C., Tapia, R. D. C., Incaluque, J. L., Aguila, O. E. P., ... & Arias-Gonzáles, J. L. (2023). Examining the Impacts of ChatGPT on Student Motivation and Engagement. *Social Space, 23*(1), 1-27. https://socialspacejournal.eu/menu-script/index.php/ssj/article/view/156/68

Nonita, S., Xalikovich, P. A., Kumar, C. R., Rakhra, M., Samori, I. A., Maquera, Y. M., & Gonzáles, J. L. A. (2022). Intelligent Water Drops Algorithm-Based Aggregation in Heterogeneous Wireless Sensor Network. *Journal of Sensors, 2022*, 6099330. https://doi.org/10.1155/2022/6099330

Poorian, M. (2016). *Managing Identity Development for International Students in a Malaysian Public University* (Doctoral dissertation, Universiti Teknologi Malaysia). http://eprints.utm.my/id/eprint/78162/1/MahmoudPoorianPFP2016.pdf

Qadir, J. (2023). Engineering education in the era of ChatGPT: Promise and pitfalls of generative AI for education. In *2023 IEEE Global Engineering Education Conference (EDUCON)* (pp. 1-9). IEEE. https://doi.org/10.1109/EDUCON54358.2023.10125121

Rahman, M. M., & Watanobe, Y. (2023). Chatgpt for education and research: Opportunities, threats, and strategies. *Applied Sciences, 13*(9), 5783. https://doi.org/10.3390/app13095783

Ramos, W. R. M., Herrera, E. E., Manrique, G. M. L., Acevedo, J. E. R., Acosta, D. B., Palacios-Jimenez, A. S., Peña, P. F. P., Berrios, H. Q., Paricahua, E. P., & Vasquez-Pauca, M. J. (2022). Responsible leadership: a comparative study between Peruvian national and private universities. *Eurasian Journal of Educational Research,* (99), 143-154. https://ejer.com.tr/manuscript/index.php/journal/article/view/811

Schwarzenberg, P., Navon, J., Nussbaum, M., Pérez-Sanagustin, M., & Caballero, D. (2018). Learning experience assessment of flipped courses. *Journal of Computing in Higher Education, 30*, 237-258. https://doi.org/10.1007/s12528-017-9159-8

Singh, D. (2023). ChatGPT: A new approach to revolutionise organisations. *International Journal of New Media Studies (IJNMS), 10*(1), 57-63. https://www.ijnms.com/index.php/ijnms/article/view/45

Su, J., & Yang, W. (2023). Unlocking the power of ChatGPT: A framework for applying generative AI in education. *ECNU Review of Education*. https://doi.org/10.1177/20965311231168423

VanLehn, K. (2011). The relative effectiveness of human tutoring, intelligent tutoring systems, and other tutoring systems. *Educational psychologist, 46*(4), 197-221. https://doi.org/10.1080/00461520.2011.611369

Zhai, X. (2023). ChatGPT and AI: The Game Changer for Education. *Available at SSRN*. https://ssrn.com/abstract=4389098