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The Role of ChatGPT in Enhancing Pakistani ESL Learners' Writing Skills

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Abstract

Artificial intelligence (AI) in education is a part of the ongoing development process, and its latest chatbot, ChatGPT is a part of it. This research investigates the role of ChatGPT in enhancing ESL learners' writing skills by addressing the following three main goals: (1) To find out the main perceptions of ESL learners to determine ChatGPT's usefulness in enhancing their writing skills,(2) To investigate the ESL learners' perceptions of ChatGPT's ease of use in improving their writing skills among undergraduate ESL students, and (3) To measure the extent of ESL learners' intention to use ChatGPT as a tool for enhancing their writing skills and to investigate the manifestation of this intention in actual use. Using cluster sampling technique, quantitative data were collected from 120 students of the University of Malakand (UOM) through a 5-point Likert scale questionnaire. Data were analyzed using both descriptive and inferential statistics. Employing the Technology Acceptance Model (TAM), the findings indicate a discrepancy between students' perceptions of ChatGPT and their real interactions with it. A lack of new technology literacy and inadequate application advice, low confidence, lack of awareness are attributed to it. The results of this study reveal challenges in adopting ChatGPT as a writing assistant and inform instructional strategies in ESL.

Keywords: ChatGPT, Technology Acceptance Model (TAM), writing skill

Introduction

Across the continuum of ESL education, proper writing form not only leads to academic improvement, it is also essential for success in the job market. However, the path to inducing writing competency may involve obstacles, which are mainly associated with those students studying in the undergraduate ESL. With the advent of the digital age, communication barriers are no longer a cause for concern. The technology enables us to communicate with other people effortlessly. ChatGPT is a tool that incorporates AI technology, to create text, communicate in conversations and can provide meaningful writing samples (Barrot, 2023).

Prastiwi (2019) states that new educational technologies change learning system in the field of education. This research aims to discover how ChatGPT is used in the

process of the development of writing skills among ESL students. The main goal here is to find out as how the students perceive and react to the AI writing assistant, ChatGPT given the context of the Technology Acceptance Model (TAM). The technology integration into ESL writing instruction has represented one of the greatest transformations in how teachers train the basic course. Through digital tools, students, who are struggling, in writing, are provided with immediate feedback, opportunities of collaboration, and access to scaffolding, which helps them while dealing with the complexities of academic writing. Despite the fact that the advancement of AI technology is in view and brings about a distinct field of possibilities for fostering ESL learners' development of writing, the challenge is about how to effectively utilize those opportunities (Fahimirad & Kotamjani, 2019).

The term "artificial intelligence" was coined by John McCarthy in 1956 during a workshop held at Dartmouth College. In the proposal for the workshop, McCarthy defined its aims as follows: "An artificial intelligence study based on the assumption that everything that a human being learns or any other aspect of intelligence can, theoretically, be exactly specified to be simulated by a machine, and then that machine can learn how to use language, develop abstractions and concepts, solve critical problems previously done by humans, even expand their abilities" (Russell &Norvig, 2010, p. 17). In their work, Baker and Smith (2019) categorize AI tools in education into three main groups: a) those that directly involve learners, b) tools for teachers to use, and c) tools that serve institution's needs. The popularity of chatbots is increasing, being one of the primary methods of conversation. A Chabot is a computer platform that is involved in bridging this discussion. Chabot, also known as a chatterbot, is an interactive software that puts humans in a similar intellectual context with one or more people, both audio and text (Falah & Syamsidar, 2021; Haristiani, 2019).

The development of tech-based learning tools, including language learning apps, has been a significant factor in steering the discourse within the realm of linguistics research and teaching applications that has also been propelled by the emergence of the world's first prompt-based AI language model, ChatGPT which was launched by OpenAI in November 2022. Technology brings forward distinctive possibilities for language learners in terms of being able to develop their target

language in an interactive and meaningful way through authentic resources that help a more continuous immersion in the language (Hassan Taj et al., 2017; Loncar et al., 2001). Moreover, technology contributes to learners having a better motivation and being more autonomous as they acquire the ability to control their learning quest (Gikas and Grant, 2013; Peterson, 2017).

To comprehend how users, specifically ESL learners, utilize and view ChatGPT in their writing process, the Technology Acceptance Model (TAM) offers a robust platform. TAM posits that a user's intention to use a technology is influenced by two primary factors: perceived usefulness and perceived ease of use. Usefulness perceived is the extent to which a user believes that technology will make their performance better whereas Ease of Use perceived is the user's opinion of how easy it is to work with the technology (Davis, 1989).

Literature Review

Many people have diverse views on the concept of Artificial Intelligence (AI). One class of definitions states that AI is a machine, a computer or a computer system that simulates behaviors and cognitive functions relating to the human brain. Such functions include learning and problem- solving (Russell &Norvig, 2010). One group defines AI as a particular set of computer skills. For example, Baker and Smith (2019, p.10) argue that "AI is a computer which renders cognitive tasks, oftentimes associated with human minds and particularly knowledge acquisition and problem- solving." Encyclopedia Britannica supports the definition by stating that "AI is the ability of a digital computer or one which is computer-controlled to perform functions that normally are performed by intellectuals." The other perspective of AI is from the broader concept of science which it defines as a science. Stone et al. (2016) state that "artificial intelligence (AI) is a science and a set of computational technologies that are inspired by but typically operate quite differently from the ways people use their nervous systems and bodies to sense, learn, reason, and take action." Merriam-Webster Dictionary combines these aspects of artificial intelligence, defining it as: a) computer science branch that focuses on a machine's ability to mimic intelligent human behavior, and b) a computer's ability to duplicate human behavior.

Fitria (2021b) notes that this technology has been invented to facilitate human activities. Alongside the positive impact, the A.I. presence could also have negative

effects, especially on the jobs provided by humans. AI is a human intelligence simulation that uses computers that are intended to function just like humans do (Fitria, 2021). Some respond using humans and make use of machines to automatically reply to queries from humans (Maitri, 2019). The world is more and more dominated by Artificial Intelligence across various industrial areas, especially Chatbot technology being one of the must-have elements for any company (Luo et al., 2019; Wei et al., 2018). It is a software application that employs NLP (natural language processing) and deep learning methods to interact in text chat conversations over the internet (Dharani et al., 2020). Relations between a person and a machine have been subject of study by many experts for centuries (Thorat& Jadhav, 2020). These days there has been an incrementing number of chatbots deployed to make people's lives easier (Swann, 2019), consequently, choosing tasks, making decisions or other activities. In the age of conversational services, chatbots now reign as the market-leading technological efficiencies (Lalwani, et al., 2018). Chatbot is a class of intelligent systems being designed using artificial intelligence (A.I.) and natural language processing (NLP) technologies.

The latest version of a natural-language system ChatGPT was published to the public on 30 November 2022 (Castelvecchi, 2022). The platform (https://chat.openai.com/) is created by OpenAI, a nonprofit research organization to guide the research and diverse uses of AI. OpenAI is a start-up in San Francisco, California, that received $1 billion from tech entrepreneurs Sam Altman and Elon Musk at its foundation in 2015. A number of past researches have looked into both capabilities and possible uses of chatbots. The use of Chatbot can be accessed through several cloud services (Rahman et al., 2017). Worth mentioning is the role of chatbots in innovating and making the process of long-term commitment to health promotion programs easier as discussed by Fadhil &Gabrielli (2017). Benedictus and his crew (2017) indicated that Chatbot Helpdesk application aims to respond to the problems users experience with the Sam Ratulangi University Integrated Information System. The article, for instance, explains how chatbots respond to questions, give answers as well as serve as customer support units by Mr. Astuti and Fatchan (2019) and Dr. Hakim et al. (2020).

Chen et al. (2021) emphasize the positive impact of chatbots on customer experience,

noting the chatbot's usability as beneficial for extrinsic customer values, and its responsiveness as advantageous for intrinsic customer values. Nugraha & Sebastian (2021) suggest that chatbots can be particularly valuable for companies or institutions lacking specific resources for handling question and answer services. Kadaton & Soekarta (2019) explore the use of Line chatbot services as an interactive medium for delivering information on tourist attractions.

The Role of ChatGPT in Learning

A research study conducted by Agustini (2023) to investigate how ChatGPT, being an AI- powered chatbot, operates as a learning aid in encouraging independent learning of English language among Indonesian students enrolled in the Kurikulum Merdeka Belajar (KMB) program. The study employed a mixed-methods research design that integrated questionnaires that explored how English Language Learners utilize ChatGPT to self-regulate their learning processes, define goals and make decisions about their English language mastery. Furthermore, the study examined how ChatGPT could be an effective tool for the KMB program and used to encourage independence and individualized learning. The exploratory study, which was conducted to synthesize recent literature, proposes the pros and cons of the ChatGPT relative to teachers' instruction and learning process (Baidoo et al., 2023).

Users could take advantage of ChatGPT such as personalized tutoring, interactive learning, activities prompts that provide ongoing feedback for teach and learn, etc. This research has also pointed out some potential weaknesses of ChatGPT including but not limited to the fact that it can produce completely false info, and data bias, which may enhance the existing bias, privacy issues, etc. One of the current studies focuses on the central problem of the educational system, namely can Chat-GPT be used as an educational tool? (Sharma & Yadav 2022). Summing up this article, with its imperfections in the current developmental stage, ChatGPT can be regarded as a useful instrument employed in Academic Sector. On the other hand, both teachers and students need to learn how to manage their uses of this technology in the right ways.

Academic writing is a vital aspect of language learning for ESL (English Second Language) students and requires proficiency in organizations such as coherence, grammar, and vocabulary (Campbell, 2019). Proficiency enables them to

excel in academics as effective communication skills allow them to express themselves in any professional situation (Yoon, 2011). The incorporation of technology sources in English language classes is regarded as one of the techniques to solve the issues in the learning process (Roll and Wylie, 2016, Knox, 2020), especially during writing exercises where time pressure typically emerges (Stapleton and Radia, 2010; Kessler, 2020; Rahimi and Fathi, 2022; Wang, 2022).

Further studies are important to also track the potential effect of ChatGPT on other language skills aside from writing skills. Throughout several past studies, researchers focused on the ways AI impacts the efficiency of the language learning process (Sun et al., 2021; Huang A. Y. et al., 2023). Huang, X. et al. (2023) is an exemplary article that studied the academic performance and degree of participants' engagement in AI courses and non-AI courses respectively. Moreover, a number of researches have been performed on the effectiveness of AI-enhanced language learning devices to improve writing skills in English language learners (Liu et al., 2021; Seufert et al., 2021; Wu et al., 2021; Fitria, 2023; Hsiao and Chang, 2023; Yang, 2023). A research study conducted by Hidayatullah (2023) describes how students use ChatGPT in their English writing skills and avoiding plagiarism. ChatGPT did what nobody could think - being the fastest growing consumer application ever, with an estimated 100 million monthly active users just within two months after the launch (Ruby, 2023).

Although there exists a large number of studies which discuss ChatGPT's usage among plenty of populations around the world such as its impact on writing skills and student's perception in the educational context. However, there is a big gap in the Pakistani higher education system especially in institutions like University of Malakand. Scarcely any research has been conducted about how ESL learners think about the application of ChatGPT with the help of the Technology Acceptance Model. While only two studies have been carried out through TAM standpoint and there was the first one which focused on the perceptions of teachers and the second one focused on the perceptions of medical students about the use of ChatGPT in research writing, both these studies adopted qualitative and mixed methods approach to research respectively. In sum, although, as far as we know, the issue has not been studied quantitatively so as to cover this question comprehensively, Malakand University's

ESL learners' perceptions of ChatGPT can be examined via the applicability of the TAM framework. On the contrary, it is necessary to cover this gap in the literature through quantitative research about the ESL learners' perceptions towards ChatGPT at Malakand University, using the TAM point of view. This study is going to explore these views which in turn will help in advancing the existing body of literature on the technology acceptance in educational context, focusing on the Pakistani context in particular.

Research Methodology

The TAM is the theoretical basis for explaining ChatGPT from the ESL learners' perspectives. Developed by Davis in 1989, the TAM describes that perceived usefulness and perceived ease of use are the significant factors influencing attitude and behavioral intention towards technology adoption.

Components of TAM

The Technology Acceptance Model is based on the assumptions of the TRA (Theory of Reasoned Action) (Fishbein & Ajzen, 1975), and describes a system's acceptance process through 5 factors:

1. **Perceived Usefulness (PU):** The extent to which users believe that ChatGPT will help them enhance their writing skills.
2. **Perceived Ease of Use (PEOU):** The extent to which users believe that ChatGPT is easy to use and handle.
3. **Attitude towards using technology (ATT):** User's general attitude towards ChatGPT for enhancing their writing skills.
4. **Behavioral Intention (BI):** User's intention to use ChatGPT for their writing tasks.
5. **Actual Use (AU):** The degree to which students actually use ChatGPT to improve their writing skills and performance.

This model has been modified by researchers to adapt it to different contexts and to increase the percentage of variance that can be explained by adding constructs from other theories and hypothesis (Hernández García, 2012). For this research, we adapted the Technology Acceptance Model (TAM) by deleting the attitude (ATT). This decision has been based on previous researches that has shown a high correlation between

attitude and behavioral intention (Mailizar et al., 2021; Prieto et al., 2017). As there is such a strong relation between the two components, we decided that behavioral intention would be a sufficient indicator of attitude, and made the attitude component itself redundant. Secondly, the modified version of Technology Acceptance Model (TAM) has eliminated the attitude factor, as behavioral intention has been considered a more direct predictor of actual usage (Venkatesh & Davis, 1996, p. 453). I emphasized the PU, PEU, BI and AU components that affect technology acceptance. By eliminating the attitude component, I simplified the model without the loss of explanatory power, which helped me to focus on the relationships between the remaining components deeper.

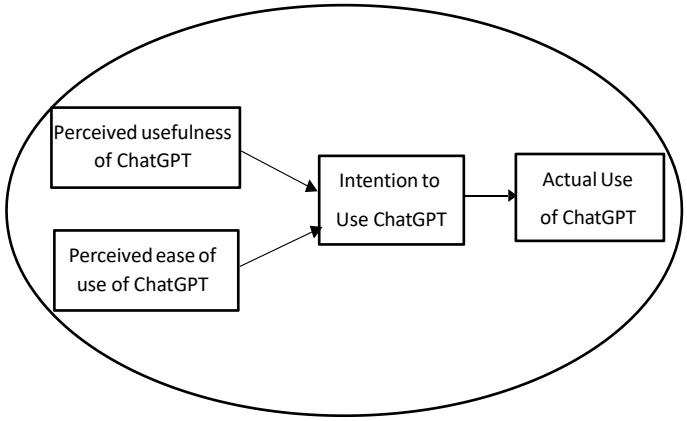


Figure 3. 1: Conceptual Model of TAM

Research Questions

1. How do ESL learners perceive the usefulness of ChatGPT in improving their writing skills?
2. What are the main perceptions of ESL learners to determine ChatGPT's ease of use in enhancing writing skills?
3. To what extent do ESL learners intend to use ChatGPT as a tool for enhancing their writing skills, and how does this intention manifest in the actual use?

Research Methodology

The word "methodology" refers to a process for conducting searches or resolving research issues (Industrial Research Institute, 2010). This research adopted a quantitative method of research employing a survey methodology. A questionnaire was used as a tool by the researcher to collect data from different departments at University of Malakand and took a sample size of 120 respondents, which is considered

a satisfactory number for validating our proposed research study.

Research Design

The research design adopted for this study is quantitative, utilizing a survey methodology. Surveys are questionnaires that are administered to research participants who answer the question. This approach involves collecting data through structured questionnaires administered toparticipants from various departments including English, Psychology and Sociology at the University of Malakand.

Quantitative Research

Studies that can analyze the data in question in numerical terms are considered quantitative research. This research is quantitative in nature. The researcher used questionnaire which is basically a tool of quantitative research. Data are in numerical form and collected using Likert scale which is the characteristic of quantitative research. In this research, Sample was selected through cluster sampling which is a method of random sampling.

Population

The participants in this study are comprised of different departments of University of Malakand, such as English, Sociology and Psychology. The sample is the subgroup of population.

Sample

In this research sample was selected through cluster sampling which is a technique of random sampling. The sample size is 120 respondents which is considered a satisfactory number for validating the proposed research study. The respondents were more familiar with ChatGPT. Therefore, it was expected that this particular choice of respondents would give the researcher access to the perceptions of students regarding the use of ChatGPT. The selection of this sample allowed the researcher to readily approach respondents and determine their perceptions.

Instrument or Tool

The questionnaire was utilized as the primary data collection approach in this research study. This approach was deliberately picked to gather quantitative information on students' perception of using ChatGPT, and to respond to the study's research questions. The four categories of the survey are Perceived usefulness of ChatGPT, Perceived Ease of use of ChatGPT, Behavioral intention to use ChatGPT and Actual

Use of ChatGPT. The researcher used a five-point Likert scale (Likert, 1932):

1. Strongly Disagree 2. Disagree
3. Neutral 4. Agree
5. Strongly Agree

The questionnaire includes items. These items measured a total of 4 components of the TAM model. These components are:

1. Perceived Usefulness of ChatGPT
2. Perceived Ease of Use of ChatGPT
3. Behavioral Intention to use ChatGPT
4. Actual Use of ChatGPT

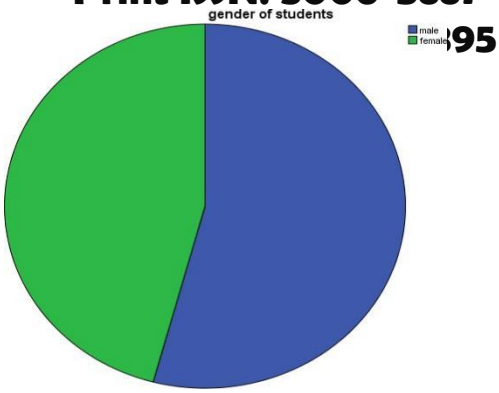
The total number of questions on the survey is 28. Items 1 to 7 belong to Perceived Usefulness; items 8 to 14 belong to Perceived Ease of Use, items 15 to 21 belong to Behavioral intention to use ChatGPT, and items 22 to 28 belong to Actual use of ChatGPT.

Data Analysis

A total of twenty-eight questions were put forth in the questionnaire which were closed- ended. The closed-ended questions were specifically designed to gauge participants' perspectives using the Likert scale, which included response options ranging from "strongly disagree" to "strongly agree". Simple descriptive analysis, which includes frequency, percentage, mean value, and standard deviation, was used by the researchers to analyze the data. With the agreement of the teachers, the researcher visited the classrooms collected the data and then handed the questionnaires to the students during class. It was collected in 35 to 40 minutes. Later, the information was inserted into SPSS statistics (version 22) and used in a straightforward descriptive inquiry to establish a conclusion.

Questionnaire Received Responses Data Analysis

The analysis of the survey data yields significant findings on the perspectives of ESL learners regarding the use of ChatGPT and its role in improving writing skills. This section provides an in-depth analysis of the survey results, offering insights into the perceptions, intentions of participants and their actual use of ChatGPT. The key findings are presented and discussed comprehensively. The data was gathered through a questionnaire and analyzed using SPSS (version 2022). Descriptive analysis was



used that includes frequency, percentage, mean value and standard deviation. Findings and results are presented through tables pie charts and bar charts and further t-test and ANOVA were conducted to find the significance and the results were presented through tables.

Demographic Information

The researcher distributed one hundred twenty questionnaires among ESL learners at UOM from the departments of English, Psychology and Sociology and I received all the one hundred twenty responses back showing an encouraging outcome for the proposed research work.

Age-Wise Distribution of Participants

Table 4.1 depicts the age of the students. According to the results of the survey, the age 23 years old comprises the largest proportion of respondents, comprising 43.3% of all responses. The age category of 22 years comprises 30.8% of the responses, making it the second-largest segment. Only 20.8% of respondents were the age of 24, and only 5.0% were the age of 25.

Table 4.1: Age-wise distribution of participants

Total	Minimum	Maximum	Mean	Std. Dev
120	22	25	23	.85

Gender-wise Distribution of Participants

The data indicates that among all respondents, 54.2% identified as male and 45.8% as female. By incorporating gender as a demographic variable, the researcher can obtain a deeper understanding of how gender may influence the views and responses of survey participants, thereby enhancing the depth and richness of the survey analysis.

Figure 4.1 provides a visual representation of the gender demographics of the population surveyed. It facilitates a quick and simple understanding of the gender distribution among the participants. The comparison between the percentages of male and female participants is notable, with male respondents exceeding the female

respondents.

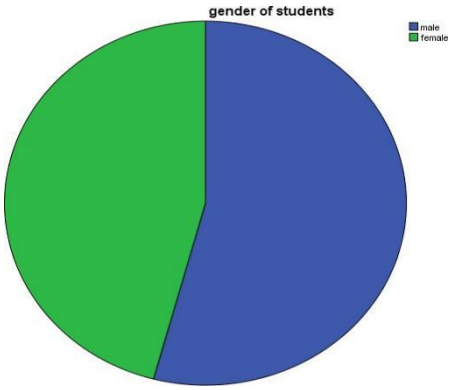


Figure 4.1: Gender-wise distribution of participants

Department-wise Distribution of Participants

The survey reveals the distribution of respondents among the three departments at the University of Malakand. The accumulated data provides insight into the demographic characteristics and academic view of the participants.

Figure 4.2 provides a visual illustration of the distribution by displaying the percentage of participants from each department. Three Departments at UOM provided data to the researchers. An equal percent of data was provided by each department, each contributing 33.3 % of the total data.

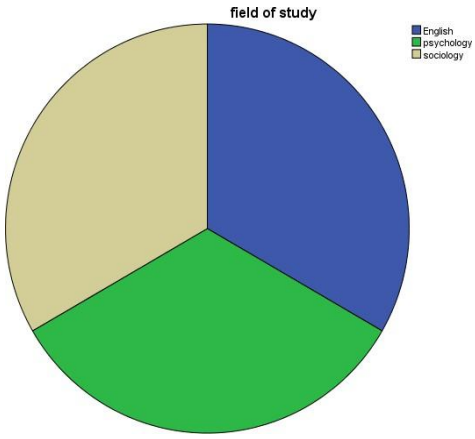


Figure 4.2: Department-wise distribution of participants

Closed-ended Questions Analysis

In this research, the researcher explored the role of ChatGPT in improving writing skills through the framework of the technology acceptance model. I concentrated on the four important components of the Technology acceptance model: Perceived usefulness, Perceived Ease of Use, Behavioral intention and Actual Use. First, I conducted an item-wise analysis to examine each question item related to these

components. Next, I performed a group-one analysis to examine the four components of TAM as a whole.

Item-wise Analysis:

First the researchers carried item wise analysis.

a) Perceived Usefulness of ChatGPT

Table 4.2: Perceived Usefulness

S. No	Statements	S.D %	D %	N %	A %	S.A %	Mean	S.Dev
1.	Using ChatGPT for writing tasks enables me to enhance the clarity of my writing.	7.5	12.5	22.5	45.8	11.7	3.42	1.09
2.	Chat GPT is helpful in generating ideas for my writing assignments.	1.7	7.5	13.3	56.7	20.8	3.88	.88
3.	Using ChatGPT helps me to arrange my thoughts and structure my writing better.	5.0	12.5	23.3	43.3	15.8	3.52	1.06
4.	I find ChatGPT useful for proofreading and editing my writing.	20.8	30.0	16.7	21.7	10.8	2.72	1.31
5.	ChatGPT helps me to use the correct vocabulary and language in my writing.	7.5	19.2	21.7	39.2	12.5	3.30	1.14
6.	Using ChatGPT saves my time and effort in completing my written tasks.	5.8	4.2	11.7	41.7	36.7	3.99	1.09
7.	ChatGPT assists me in creating more coherent	5.8	12.5	30.8	35.0	15.8	3.42	1.08

	and well-structured writing.

First, the researchers carried analysis of the statements of perceived usefulness of ChatGPT. The result is shown in the table 4.2. The perceived usefulness of ChatGPT provided important insights. A significant number of students (78%) showed a high level of agreement/strongly agreement with the statement that ChatGPT saves their time and hard work, 11.7% of the sample chose neutral option while only 10% of the population sample strongly disagreed/disagreed with the statement. Students expressed positive attitude toward the second statement that ChatGPT helps in the generation of ideas for assignments with 77% strongly agreement/ agreement, only 7.5% of the sample disagreed/strongly disagreed and 13.3% remained unanswered. A noteworthy number of the participants, precisely 59% agreed/strongly agreed with the statement that ChatGPT helps in the arrangement of thoughts and structuring of writing while 17.5% either disagreed/strongly disagreed and 23.3% remained undecided. Students' opinions are divided on the statement that ChatGPT helps proofread and edit, with 32% of students of the sample agreed/strongly agreed with the statement, while 51% disagreed/strongly disagreed, and 16.7% chose neutral option. A substantial proportion of respondents (50-58%) demonstrated that ChatGPT helps in enhancing the clarity of writing, using appropriate vocabulary and language, and producing more coherent and well-structured writing. In general, the findings indicate that ChatGPT is a beneficial and important application for students.

b) Perceived Ease of Use of ChatGPT

Table 4.2: Perceived Usefulness

S. No	Statements	S.D %	D %	N %	A %	S. A %	Mean	S. Dev
8.	I am able to easily handle and use ChatGPT for my writing tasks.	2.5	8.3	11.7	57.5	20.0	3.84	.92
9.	ChatGPT is user-friendly and simple							

10.	I can easily access ChatGPT whenever I need to use it for my writing.	5.0	12.5	57.5	25.0	0.00	4.02	.76
11.	ChatGPT offers useful guidelines for utilizing its features.	8.3	31.7	15.0	33.3	11.7	3.08	1.21
12.	I am at ease using ChatGPT for the generation and editing of text.	2.5	15.0	30.0	41.7	10.8	3.43	.96
13.	The interface of ChatGPT is simple and easy to use.	2.5	10.0	10.0	63.3	14.2	3.77	.90
14.	I can easily learn how to use the features of ChatGPT to enhance my writing skills.	5.8	21.7	15.0	38.3	19.2	3.43	1.19

The researchers also carried analysis of the statements of perceived Ease of Use of ChatGPT. The result is shown in the table 4.3

Table 4.3: Perceived Ease of Use

S. No	Statements	S.D %	D %	N %	A %	S. A %	Mean	S. Dev
8.	I am able to easily handle and use ChatGPT for my writing tasks.	2.5	8.3	11.7	57.5	20.0	3.84	.92
9.	ChatGPT is user-friendly and simple to understand, even for a person with little	5.8	10.0	13.3	52.2	18.3	3.68	1.07

technical knowledge.

10.	I can easily access ChatGPT whenever I need to use it for my writing.	5.0	12.5	57.5	25.0	0.00	4.02	.76
11.	ChatGPT offers useful guidelines for utilizing its features.	8.3	31.7	15.0	33.3	11.7	3.08	1.21
12.	I am at ease using ChatGPT for the generation and editing of text.	2.5	15.0	30.0	41.7	10.8	3.43	.96
13.	The interface of ChatGPT is simple and easy to use.	2.5	10.0	10.0	63.3	14.2	3.77	.90
14.	I can easily learn how to use the features of ChatGPT to enhance my writing skills.	5.8	21.7	15.0	38.3	19.2	3.43	1.19

c) Perceived Ease of Use

The perceived Ease of Use of ChatGPT also provided important findings. The majority of the participants 77% either agreed/strongly agreed that ChatGPT is easy to handle and use for writing tasks,11% of the sample either showed disagreement/strongly disagreement towards the statement and 11.7% remained unanswered. Further,71% of the sample either agreed/strongly agreed that ChatGPT is user-friendly and easy to understand, even for people with little technological knowledge while only 16% either disagreed/strongly disagreed with 11.7% remaining undecided. However, students have shown mixed opinions regarding the ease of accessing ChatGPT when they need it and ChatGPT's provision of helpful guidelines with 57.5% remaining unanswered. A large number of students (around 52-77%) expressed strong agreement/agreement that ChatGPT is simple and easy to use including its interface, students feeling at ease to use it for text generation and editing,

and easy to learn its features for writing. Overall, the findings demonstrated that ChatGPT is quite easy to use and also easily accessible.

d) Behavioral Intention

The researchers then carried analysis of the statements of Behavioral Intention. The result is presented in the table 4.4.

Table 4.4: Behavioral Intention

S.No	Statements	S.D %	D %	N %	A %	S. A %	Mean	S.Dev
15.	I plan to use ChatGPT frequently For my writing assignments.	8.3	27.5	18.3	40.8	5.0	3.07	1.10
16.	I intend to employ ChatGPT to assist me with my writing assignments in the future.	8.3	11.7	30.8	38.3	10.8	3.32	1.08
17.	I am willing to use ChatGPT to enhance the quality of my writing.	7.5	15.0	24.2	43.3	10.0	3.33	1.09
18.	I intend to suggest ChatGPT to my classmates for their writing assignments.	8.3	25.0	18.3	40.0	8.3	3.15	1.14
19.	I plan to use ChatGPT to assist me with writing tasks apart from academic assignments.	6.7	20.0	13.3	49.2	10.8	3.38	1.12
20	I am going to keep using ChatGPT even after the assignment is finished.	10.0	33.3	17.5	25.0	14.2	3.00	1.25
21.	I plan to explore more features of	14.2	19.2	19.2	35.8	11.7	3.12	1.26

	ChatGPT to improve my writing skills.							

The majority of the students (around 38-43%) expressed a positive behavioral intention towards the use of ChatGPT showing their inclination to use it for future writing tasks (38.3%), improve the value of their writing (43.3%), and help them in their writing assignments beyond academic tasks (49.2%). These findings suggest that students are willing to continue the use of ChatGPT and investigate its features to enhance the quality of their writing. Further students' opinions are divided on both statements regarding the frequent use of ChatGPT and their intention to suggest it to classmates with 18.3 % remaining undecided. As for as statement number 20 is concerned, 43% of the students have shown strong disagreement/disagreement showing that they are unwilling to use it after the assignment is finished. Overall, the findings indicate that ChatGPT has produced a strong inclination among students to use ChatGPT but its long-term inclusion into their writing patterns is dubious and may need further persuasion and support.

Actual Use of ChatGPT

The researchers also performed Analysis of the statements of actual use of ChatGPT. The result is shown in the table 4.5.

Table 4.5: Actual Use of ChatGPT

S.No	Statements	S.D %	D %	N %	A %	S. A %	Mean	S. Dev
22.	I use ChatGPT to generate ideas for writing assignments, such as suggesting topics or outlines.	5.0	9.2	10.8	63.3	11.7	3.68	.97
23.	I regularly use ChatGPT to help me write coherent and well- structured paragraphs.	7.5	23.3	28.3	32.5	8.3	3.11	1.09

24.	I use ChatGPT for editing and proofreading my writing.	14.2	38.3	12.5	27.5	7.5	2.76	1.22
25.	I rely heavily on ChatGPT to complete my writing tasks efficiently.	28.3	21.7	15.0	27.5	7.5	2.98	4.00
26.	I frequently use ChatGPT for improving sentence structure and clarity to enhance the quality of my writing.	5.0	15.0	31.7	35.8	12.5	3.36	1.04
27.	I use ChatGPT for most of my writing tasks including academic assignments and personal projects.	4.2	24.2	20.0	45.0	6.7	3.26	1.03
28.	I am comfortable using ChatGPT for a wide range of tasks, from brainstorming to finalizing task.	9.2	6.7	28.3	39.2	16.7	3.48	1.13

A considerable number of students have reported the actual use of ChatGPT for different writing tasks and assignments, such as generation of ideas for assignments (74%), enhancing the clarity of writing and structure of sentences (48%) and utilizing it for almost all the writing tasks (51%). Further, approximately 56% of the students are relaxed while using ChatGPT for many tasks, 16% of the students either disagreed/strongly disagreed and 28.3% remained undecided. In addition, a

considerable number of students either strongly disagreed/disagreed with both the statements, the use of ChatGPT for editing and proofreading (53%) and depending excessively on ChatGPT to complete their writing tasks effectively (49%) with 27.5 % strongly agreement/agreement. Students' opinions are divided on statement 23 regarding the frequent use of ChatGPT for coherent and well- structured writing with 41% strongly agreement/agreement and 31% strongly disagreement/ disagreement and 28.3 remained unanswered. In general, the findings highlight that students have actually employed ChatGPT in significant ways, but its integration, strength and usefulness differ across diverse writing tasks and individual inclination. The results demonstrated the requirement of further support, development and training to maximize its potential.

Group-wise Analysis: The researchers also conducted group wise analysis of the collected data. The result is shown in the table 4.6.

Table 4.6: Group-wise Analysis

Components of TAM	Total students	Mean	St. Deviation
Perceptions about usefulness of ChatGPT	120	3.46	.76
Perceptions about Ease of Use of ChatGPT	120	3.61	.63
Behavioral Intention to Use ChatGPT	120	3.19	.83
Actual Use of ChatGPT	120	3.23	1.02

Perceptions about the usefulness of ChatGPT (3.46) and ease of use of ChatGPT (3.61) are comparatively strong, showing a positive perspective of ESL learners towards ChatGPT. This demonstrates that students find ChatGPT as a useful tool and easy to use, which are the two highly associated concepts of Technology acceptance Model (TAM). Behavioral intention to use ChatGPT (3.19) is to some extent high, showing the inclination of students to continue the use of ChatGPT. This concept is linked with the perceived usefulness and perceived ease of use, as students are more willing to employ an application, they find it easy to use and useful. The Actual Use of ChatGPT (3. 23) is also to some extent high, which indicates a relatively high level of integration of ChatGPT in actual use. This concept is linked to behavioral intention as

students who intend to use ChatGPT are likely to utilize it actually.

a) Group differences in students' perceptions, intentions and actual use of ChatGPT for enhancing writing skills based on gender and field of study:

Independent sample T Test and One-way ANOVA were performed to find out significant differences in students' perceptions, intentions and actual use of ChatGPT for enhancing writing skills based on gender and field of study respectively. First, an independent sample T- Test was performed for group differences based on gender then One-way ANOVA was performed for group differences based on the field of study.

b) Gender-based differences

An Independent sample t-test was performed to determine gender differences in the four areas: perceived usefulness, perceived ease of use, behavioral intention and actual use in terms of gender.

Table 4.7: Gender-based differences

		Levene's Test for Equality of Variances		t-test for Equality of Means					
								95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
perceptions about usefulness of ChatGPT	Equal variances assumed	.566	.453	.094	118	.925	.01319	.13975	-.26356	.28993
	Equal variances not assumed			.093	106.506	.926	.01319	.14167	-.26768	.29405
perception	Equal								-.03375	

about ease of use of ChatGPT	Equal variances assumed	.391	.533	1.685	118	.095	.19281	.11441	.41937
	Equal variances not assumed			1.688	115.500	.094	.19281	.11420	-.03339 .41901
behavioral intention to use ChatGPT	Equal variances assumed	.023	.880	.744	118	.458	.11369	.15270	-.18871 .41608
	Equal variances not assumed			.748	116.540	.456	.11369	.15198	-.18731 .41468
actual use of ChatGPT	Equal variances assumed	1.791	.183	1.790	118	.076	.33307	.18605	-.03537 .70150
	Equal variances not assumed			1.858	108.851	.066	.33307	.17925	-.02220 .68834

An Independent sample t-test was carried out to determine gender differences but no significant differences were found.

c) Discipline-based differences

One-way ANOVA was performed by the researcher to determine discipline differences in the four areas: Perceived Usefulness, Perceived Ease of Use, Behavioral Intention and Actual Use of ChatGPT. The result is shown in the table 4.8.

Table 4.8: Discipline-based differences

		Sum of squares	Df	Mean Sq.	F value	Sig.
perceptions	Between groups	3.554	2	1.777	3.193	.045

about usefulness of ChatGPT	Within groups	65.109	117	.556		
	total	68.663	119			
perception about ease of use of ChatGPT	Between groups	1.333	2	.666	1.703	.187
	Within groups	45.789	117	.391		
	total	47.122	119			
behavioral intention to use ChatGPT	Between groups	6.369	2	3.184	4.903	.009
	Within groups	75.990	117	.649		
	total	82.359	119			
actual use of ChatGPT	Between groups	4.190	2	2.095	2.029	.136
	Within groups	120.802	117	1.032		
	total	124.992	119			

In between groups differences for perceptions about the usefulness of ChatGPT based on discipline, F value was found 3.193 at p=0.45 and for behavioral intention, the F value was found 4.09 at p=0.009. No significant differences were found between groups about the actual use and ease of use of ChatGPT. To further determine, where those differences lay, so Post-hoc Tukey test was conducted.

d) Tukey Post-hoc Test Showing within Groups Differences Students' Responses Based on Discipline

To find within-group differences post-hoc Tukey test was conducted. As there were no statistically significant differences in actual use and ease of use so they were removed from the table. The result is presented in table 4.9.

Table 4.9: Tukey Post-hoc Test Result

Dependent Variable	(I) field of study	(J) field of study	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
perceptions about usefulness of ChatGPT	English	psychology	.41786*	.16681	.036	.0219	.8138
		sociology	.25714	.16681	.275	-.1388	.6531
	psychology	English	-.41786*	.16681	.036	-.8138	-.0219
		sociology	-.16071	.16681	.601	-.5567	.2353
	sociology	English	-.25714	.16681	.275	-.6531	.1388
		psychology	.16071	.16681	.601	-.2353	.5567
behavioral intention to use ChatGPT	English	psychology	.53571*	.18021	.010	.1079	.9635
		sociology	.11429	.18021	.802	-.3135	.5421
	psychology	English	-.53571*	.18021	.010	-.9635	-.1079
		sociology	-.42143	.18021	.054	-.8492	.0064
	sociology	English	-.11429	.18021	.802	-.5421	.3135
		psychology	.42143	.18021	.054	-.0064	.8492

*. The mean difference is significant at the 0.05 level.

Significant differences were found among students' responses to the statements about usefulness of ChatGPT in English and psychology students with a mean difference I-J=.42 at *p=0.04.* It shows that the mean difference in English is positive so English students' agreement with usefulness of ChatGPT is stronger as compared to students of psychology.

Further, significant differences were found among students' responses to the statements about intention to use ChatGPT in English and psychology students with a mean difference I-J=.54 at *p*=0.01. It shows that mean difference of English is positive, so English students' behavioral intention towards ChatGPT is stronger as compared to students of psychology.

Also, significant differences were found among students' responses to the statements about intention to use ChatGPT in Sociology and psychology students with a mean difference I-J=.42 at *p*=0.05. It shows that mean difference of Sociology is

positive, so Sociology students' behavioral intention towards ChatGPT is stronger as compared to students of psychology.

The researcher conducted item-wise as well as group-wise analysis. The results of the research showed that students agreed with all the statements about perceived usefulness of ChatGPT except the one about proofreading on which opinions were divided, which shows their positive perceptions of usefulness of ChatGPT. As far as the Ease of Use is concerned, students showed positive responses which indicate that they have positive perceptions of ease of use of ChatGPT, which indicate that students have positive perceptions of ease of use of ChatGPT showing that ChatGPT is easy to use and accessible. Further the results showing the students' behavioral is reasonably low than those of perceptions but still the results mostly showed positive responses of students towards the statements related to Intention to use ChatGPT. And the results about the actual use is concerned these responses were also moderately lower than those of perceptions about usefulness and ease of use of ChatGPT, but almost the same as those of behavioral intention. Moreover, as for group-wise analysis is concerned, Perceptions about usefulness of ChatGPT and ease of use of ChatGPT are relatively strong, showing positive perceptions of ESL learners towards ChatGPT. This indicates that students find ChatGPT a useful tool and easy to use while ESL learners' behavioral intention to use ChatGPT suggests that they are moderately likely to continue the use of ChatGPT in the future and as far as the actual use of ChatGPT is concerned it shows that they have used ChatGPT up to some extent.

Discussions

The research shows the agreements and disagreements of students with four areas of TAM regarding the role of ChatGPT in enhancing the writing skills of ESL learners. As for as the statements of the perceived usefulness are concerned, students have shown greater agreement with almost all the statements except the statement regarding the use of ChatGPT in proofreading and editing on which opinions are divided, which suggest their strong perceptions about the usefulness of ChatGPT. The findings of this study correspond to the findings of the previous research study conducted by Nayab et.al (2023), that ChatGPT is a useful tool, specifically easiness in lesson planning and assessment were also highlighted as major benefits. Further, students have shown positive perceptions regarding the ease of use of ChatGPT which indicates the ease of

use of it. The outcome is consistent with the earlier research carried out by Farah (2023), that the majority of the participants who used ChatGPT found the tool to be user-friendly and easy to use. Most of the participants indicated that they could easily and quickly understand how they could use Chat GPT for research writing. Students' responses regarding the Behavioral Intention to use ChatGPT and the actual use of ChatGPT are relatively low as compared to the perceptions which suggest that they might have low confidence to use it or the lack of facilities which create hurdles for them. The findings are in contrast with the research conducted by Farah (2023), a significant number of respondents specifically expressed their future plans confidently to use ChatGPT while writing research papers.

As far as the group-wise result is concerned, it indicates students' perceptions regarding the ease of use and usefulness of ChatGPT are relatively high as compared to the behavioral intention and actual use of ChatGPT. In my opinion, the low behavioral intention might suggest that the students have such a low confidence or low confidence in using it, or they might have limited access to it which is a hindrance in their way to use it in the future. As the use of ChatGPT requires smartphone and internet, so they might have not access to these things which creates hindrances in their way to use it. And the actual use is also relatively low, its mean value is almost equal to the behavioral intention, which indicates that they might need additional support, motivation and encouragement to actually use it. They might need awareness of the actual use of ChatGPT and its potential benefits. And also, the area in which research has been conducted is a backward and also economically weak area so that may be the reason or hindrance in the actual use of ChatGPT. The behavioral intention and the actual use of ChatGPT are low. In my opinion, there is lack of proper training, facilities like the availability of internet connection and a lack of confidence. Teachers should talk about the use of ChatGPT in classrooms and the potential benefits of it and encourage the students to use it, which will bring confidence in them to continue using it. Students should also be given proper training, workshops should be arranged where students can be taught about the actual use in the context of education, equipping them with the skill to use it, it may increase the actual use.

a) Summary of the Major Findings

This section summarizes the main findings of the research which the researcher found

out. The main focus of the study was considering perceived usefulness and perceived ease of use of ChatGPT, behavioral intention to use this technology and the actual use frequency and pattern among ESL learners. The findings of the study indicate that students have high perceptions of perceived usefulness and ease of use of ChatGPT. While their perceptions of behavioral intention and actual use of ChatGPT are low as compared to the perceived usefulness and perceived ease of use of ChatGPT.

Results show that students mostly have high perceptions of the system usability and usefulness of ChatGPT. These mean values are in line with those parameters, 3.46 and 3.61, representing strong and positive perception among students. These numbers imply that students perceive ChatGPT as a somewhat intuitive and user-friendly technology and are aware of its potential benefits in supporting their learning processes. Positive impressions have a critical role in fostering the fundamental attitudes that might propel the adoption of technology in educational environments. The study found out that behavioral intention to use ChatGPT and actual tool usage were a bit lower than perceived usefulness and ease of use of ChatGPT, despite these positive evaluations. This result points to a discrepancy between student's perceptions of the technology and their real interactions with it. This disparity may be caused by several causes, such as a lack of comfort with new technologies, a lack of direction on how to incorporate ChatGPT into their learning routines successfully, and perhaps a limited understanding of the features of the tool. This difference in values between perception and behavior needs more investigation because it suggests fundamental issues that might prevent the widespread acceptance and application of AI technologies such as ChatGPT in educational settings. To optimize the potential advantages of such technologies in raising students' academic performance, especially in writing, it is necessary to comprehend these obstacles and offer useful solutions.

Conclusion

To sum up, the purpose of this study was to find out how students used ChatGPT and how they perceived it in relation to learning English as a second language (ESL), with an emphasis on writing skills. According to the research, students had favorable opinions of ChatGPT's usefulness and ease of use of ChatGPT, which suggests that they are aware of the potential advantages this AI tool may have for improving their

educational experience. These opinions indicate the tool's user-friendly layout and compatibility with students' requirements for overcoming obstacles in the classroom.

The study also points out a significant difference between students' positive opinions of ChatGPT and their behavioral intention to use it more regularly and then their actual use. This disparity suggests a number of possible obstacles, such as a lack of knowledge regarding the technology's use, inadequate application advice, and perhaps restricted access to essential resources like internet connections and smartphones. In order to enable students to effectively utilize ChatGPT and take advantage of its potential to enhance their academic performance, it is important that these hurdles should be addressed.

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