

AI-driven Spelling Aid: Filling Spelling Gaps and Cognitive Load among Pakistani ESL Learners

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Abstract

With the growing involvement of AI in language learning, understanding spelling variation among students, especially the ESL learners, becomes crucial. The main goal of this research is that AI tools (ChatGPT and Grammarly) act as a helping tool for reducing spelling variations, overcoming difficulties between both English varieties, and also lessening the Cognitive load of Pakistani ESL learners by giving quick feedback. A mixed-method approach is conducted in this research. The Cognitive Load Theory is applied in this research, which states that our working memory can only hold little information at a time and we must avoid overloading it and therefore maximize learning (Sweller, 1988). The study's findings underscore that AI-based tools have a significant impact on ESL learners' ability to recognize and apply correct spellings across variations of British and American English. Furthermore, the results of this study demonstrate that Pakistani ESL learners have a positive attitude towards AI tools that overcome spelling errors and cognitive load. Despite growing research on AI in language learning, less emphasis has been given to its significance in addressing spelling errors across English variations. The significance of this research paper highlights how AI assists ESL learners in managing language variation without creating dependency.

Keywords: Artificial Intelligence, British and American English, Cognitive Load, Theory, ChatGPT, Grammarly, Pakistani ESL learners

Introduction

The emergence of AI in English as an ESL learning tool is gaining worldwide attention. The influence of Artificial Intelligence in educational settings is constantly shaping new learning and experiences (Al Harrasi et al., 2025). Additionally, AI can adapt to the needs and learning styles of students (Ayeni et al,

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2024). Many AI tools that are widely used are seen as helpful for eradicating confusion between spelling variations. AI tools are appreciated in other countries for their role in language learning, but in Pakistan, they remain underexplored. English is not the native language of Pakistan, so many ESL learners become confused in learning English as a second language. Through AI tools like ChatGPT and Grammarly, it becomes easier to acknowledge the differences between British and American spelling. Only a few studies explore AI as a supportive tool in overcoming spelling challenges among Pakistani ESL learners. Such spelling challenges not only affect learners' written accuracy but also their mental load. Therefore, Cognitive Load Theory is applicable to resolve this issue. So, the link between AI and Cognitive Load Theory, which focuses on how instant feedback can reduce learners' stress or mental burden, has not been studied in the context of spelling errors.

The main objective of this research is to figure out how often Pakistani ESL learners use AI tools to support learners in overcoming their spelling errors and to examine how learners are aware of the distinction between British and American spelling. Moreover, this study aims to mitigate spelling mistakes by applying Cognitive Load theory, which reduces their burden with immediate AI tools' responses.

The significance of the study is to fill the gap by examining how AI assists Pakistani ESL learners in overcoming the spelling challenges between American and British variations. Moreover, this research will give valuable insight to educators to use AI tools effectively in language learning. It also encourages future language learners to use AI responsibly, not just to replace learning, but to improve their accuracy in learning. Through this study, learners also learn the positive and negative aspects of AI tools in the Pakistani context.

Review of the Literature

❖ Spelling Challenges between British and American English

Technology is advanced, due to which AI tools have the attention worldwide. In Pakistan, ESL learners heavily rely on these technological advancements for educational purposes.

So, this literature review gave an overview of earlier studies on AI tools that help student overcome their mistakes. Numerous studies have examined the potential of AI-based tools in educational settings. For instance, the authors point out that the coexistence of American and British English varieties in Pakistani educational

settings disrupts language development. Such variations in spelling, vocabulary, and grammar often cause inconsistency and confusion, leading to lower performance and confusion in their academic activities. (Younis et al, 2025) This study highlights the issue of linguistic inconsistency and neglects modern technology. Building on this gap, the present study explores how AI tools can assist Pakistani ESL learners in overcoming spelling challenges across these English varieties by offering adaptive language learning strategies. Notably, a study conducted in the classroom settings of Bangladesh showed that the majority of learning environments follow a traditional teacher-directed manner, constrained by classroom conditions in Bangladesh. Learner autonomy is not possible in this kind of learning context. Similarly, this problem is visible in Pakistani ESL Classrooms, limiting students' independent learning opportunities due to a teacher centered environment. Although Begum's study focuses on the lack of learner autonomy and the potential of technology, but does not examine particular AI-based interventions for linguistic variations. (Begum, 2019) Based on this observation, the current study fills the gap by examining how AI tools can support self-directed learning and help Pakistani ESL students with immediate feedback to manage spelling errors across British and American English. Several scholars have remarked that, despite the growing presence of Artificial Intelligence in language learning, many AI tools cannot handle linguistic varieties effectively. Studies highlight that most of the AI-based language learning tools are made for Western users and disregard Pakistani learners' linguistic and cultural background.

(Fatima et al, 2025) As a result, these tools give favor to Western English norms, particularly American spelling and vocabulary, creating confusion for learners who are educated under British English standards. In a study by Saleem et al. (2025) he highlights that completely relying on AI tools is not enough as it not fully understands the complete details of language like expressions used in culture or idioms. This problem is common in Pakistan as students also face difficulties of different spellings between British and American English. He suggests these AI tools need proper research to be used efficiently. Therefore, this gap is filled with the analyses of the present study on how AI tools might be designed to recognize and adapt these linguistic variations, ensuring more contextually appropriate and culturally sensitive learning experiences for Pakistani learners. Similarly, Pakistani English Language Learners (ESL) finds it difficult to stick to spelling uniformity due to the variations between British and American English. Novari, Maryani, and Rostiana (2021) worked on the comparative analyses of these two English Varieties,

mainly focused on vocabulary, pronunciation, and spelling. The result exposed that learners often struggle to adopt which form of variation. For example, in British English, it is colour while in American English it is color. Spelling is a fundamental element of written communication. (Novari et al., 2021) stated that misspellings can suggest sloppiness and can lead to downright confusion and misinterpretation. The authors found that learners with English as a second language unconsciously combine both forms of English. By this, they come to the point that accuracy is possible if the learners have consistency in one English. These findings are deeply related to Pakistani ESL learners, who also have exposure to both types and find confusion in following any of them. Comparatively, in a study by Barata (2020), he examined the differences between American and British English with a focus on vocabulary and grammar. The study points out that there are different varieties of English, but the most widely used are British and American English. English is spoken by over 380 million people in countries like USA, UK, and other parts, but the differences between these two varieties confuse non-native speakers. For example, the vocabulary difference in food, where in British English it is “Biscuits” and in American English it is “Cookies “. Same with grammar differences with Simple Past vs Present Perfect British (and American) English: Have you eaten yet? American English: did you eat yet? These differences happen because of the historical spread of English through global expansion. The author shows that these differences become a problem for students, especially for those who are learning it as a second language. Thus, this study highlights that the differences between British and American English can create a problem for non-native speakers, as they are completely unfamiliar with the language. In tackling these challenges, many studies emphasize the emerging role of Artificial Intelligence tools to help in language learning.

❖ Effectiveness of AI tools

The critics discovered AI tools such as Grammarly, Quillbot, ChatGPT, Duolingo, and ELSA can improve the Pakistani ESL learners’ writing, speaking, and overall language proficiency (Shahid, Khan, & Rao, 2024). Students appreciate AI tools and give positive feedback that these tools give them immediate responses, correct their errors, and provide suggestions. AI tools give personalized feedback and suggestions that are quite helpful (Excerpt, December 21, 2023). The authors' findings showed that these tools not only help with spelling mistakes, language skills, and suggestions, but they also make students more independent and confident. (Shahid

et al.). As present research takes AI tools like Grammarly and ChatGPT, which give feedback on the regional spelling variations

(British or American), assisting Pakistani ESL learners to avoid confusion caused by mixed spellings in writing. Fitria (2023) further gives evidence of the AI's ability to enhance writing accuracy through ProWritingAid, an AI writing tool that checks grammar, spelling, and stylistic accuracy. The study found that students can self-correct their mistakes with ProWritingAid, which makes them independent. Moreover, Ariyanto et al. (2023) state that students have a favorable opinion of ProWritingAid because of its ability to improve the effectiveness of class time, give helpful comments on grammar, vocabulary, and mechanics, and build students' confidence in their works (Fitria, 2023). This further proves that the emerging AI writing tools can help Pakistani ESL learners to develop more awareness of English variations and follow spelling forms more confidently. Drawing on these findings, Saeed, Rashid, and Rasheed (2023) further added the language challenges confronted by Pakistani students due to their exposure to both types of English. Their survey-based research discloses that phonological differences, spelling variations, and vocabulary distinctions frequently confuse academic and professional communication. The authors argued that these problems arise from the absence of a state strategy that selects a specific variety of English. This causes learners to mix both forms without knowing any one of them. Therefore, authors give suggestions to solve these challenges by improving teacher training, curriculum design, and exam standards so that teaching English can become more consistent. They further add the integration of AI to help with the two varieties of English. This suggestion aligns with recent studies that AI learning tools play an important role in helping Pakistani ESL learners improve language clarity and spelling accuracy.

❖ **AI's role in reducing Cognitive Load**

In addition, Safar and Anggraheni (2024) investigated the role of AI chatbots in language learning through the lens of Cognitive Load Theory (CLT). The study reveals that chatbots are used to help students learn basic vocabulary and sentences, but not complicated grammar rules. It helps students in increasing vocabulary, but a bit overwhelming as students have to respond to the feedback. Chatbots should be used to help teachers and be designed in a way that does not burden students and making their tasks easier. Building on this framework, the present study examines how AI can be localized to support Pakistani ESL learners in managing spelling variations between British and American English without increasing

cognitive load. Additionally, recent research has also explored the CLT in relation to AI-assisted language learning. Ivanović's (2024) investigation of cognitive load in AI-assisted and traditional foreign language classrooms using CLT as the main framework. Current study revealed that AI tools can effectively manage learners' cognitive load by decreasing the stress and mental efforts through instructions and instant feedback. Different research by Ajmal, Aziz, and Hussain (2025) investigate that English is not the first language of Pakistani students, so they face many problems in learning English, as they make mistakes in using wrong word choices, repetition, and wrong prepositions. They make mistakes because they find English grammar and sentence structure complicated, as they don't get enough English writing practice in daily life. The authors suggest that using Artificial Intelligence and Computational models can help Pakistani students overcome their challenges, as these tools quickly give them feedback and correct their errors. Also, these tools can save teachers' workload and save their time, but the paper also says that these systems need research to be used successfully. This study aligns with the author's viewpoint that using these tools effectively can help Pakistani ESL learners in overcoming spelling and grammar challenges. Therefore, Ahmad, Akhtar, Jahan, and Shaheen (2025) explore how AI-based chatbots can play a vital role in helping Pakistani ESL learners learn English better. The research studies how students make mistakes in grammar, spelling, and sentence structure because British and American English have different spellings. It also says that traditional teaching methods are not enough; they should be blended with AI tools like chatbots and writing assistants, as it will help students learn faster and give them personalized feedback. The authors suggest that these tools should not completely replace teachers but should be used effectively and in a better way. This research emphasizes that by using these tools can save teachers time, too, and can help students learn spelling variations between British and English spelling. Furthermore, Khan and Ghani (2024) explore how AI based writing tools can create an impact on the academic writing skills of Pakistani graduate students. The paper emphasizes that English is an important language as it is used in education, government, almost worldwide but Pakistani students often face difficulties in writing English clearly. The findings reveal that 84% participants reveal that AI saves time in completing written tasks, 88% reveal that it raises the ability to correct mistakes, and 90% agreed that it has a positive impact on the overall accuracy of language. Also, the studies highlight that along with advantages, students face challenges as they have limited exposure, no training on how to use it effectively. The authors suggest that proper training sessions should be given, and these tools should be used along with traditional

teaching classroom. Researchers' point out that with limited exposure to these tools, students cannot use them effectively; instead, they will rely completely on them, and their own developing abilities will be reduced. Another research by Altaf and Shaheen (2025) shows that AI tools are seen as beneficial and helpful for enhancing students' English skills. It helps them in becoming more active in learning instead of passive learners. Tools like Grammarly, Google Translate, etc. are seen as improving tools for reading, writing, speaking, and listening skills. Instead of older method like Call Programs Modern AI applications use machine learning to offer effective learning. Also, some students are worried that AI tools would make learning too machine-like learning. Likewise, this research findings suggest that these tools enhance proficiency and make students feels motivated at an undergraduate level.

Despite all of these studies conducted, there is a lack of research on the effectiveness of AI tools within the Pakistani context. Additionally, Pakistani ESL learners encounter spelling difficulties that lead to mental load. So, addressing this gap, this research examines how AI acts as an effective tool in overcoming spelling challenges among learners by reducing their mental burden.

Methodology

❖ Mixed-Method

This paper employs a mixed-method approach that helps to address the research question. The current study is based on CLT to attain the research objectives by examining the effects of AI-based tools in improving spelling accuracy among Pakistani ESL students. Both qualitative and quantitative approaches are used in the data collection and analysis stages of a mixed-methods inquiry (Creswell & Clark, 2011).

❖ Data Collection

The quantitative data were collected using a Google Form Survey shared online. This approach is taken by researchers so that a diverse audience can participate, and it also reduces the researchers' biasness, which results in accurate responses. The qualitative data were gathered through semi-structured interviews, which were conducted face to face. The objective of interviewing people is to obtain precise, direct personal information from knowledgeable sources (Merriam, 1998, as cited in Zohrabi, 2013). For the current study, 15 participants were chosen for the interview.

The questions were based on the experiences, effectiveness, and opinions of participants regarding AI tools.

Theoretical Framework

Cognitive load theory is about the knowledge of human cognition (Sweller, Ayres & Kalyuga, 2011). By integrating Cognitive Load Theory, AI tools help ESL learners to minimize their burden by instantly giving them feedback on their mistakes. This led to learners self-correcting instead of struggling with their mistakes. Additionally, due to British and American spelling variations, ESL learners find it complicated to decide which variety is correct and which one is not, which creates mental load. AI tools play a role in removing this spelling confusion, and learners get quick corrections. So, Cognitive Load Theory shows how AI tools eliminate the mental effort and make the learning process easier. The data is collected through Pakistani ESL learners, that is, around 120 students. The researchers take students as their audience because nowadays AI tools are mostly used by students for educational purposes. Moreover, this study focuses on Pakistani ESL learners for whom English is a foreign language and who face numerous challenges in understanding various aspects of English.

Analyses

Different authors looked into how AI-based tools facilitate students' affectivity. They studied how AI tools with a structured design can play a role in making students better at learning languages (Chen et al., 2025). This aligns with our research that students need AI tools for their assistance to lessen their burden. The analyses of this research are based on a quantitative method supported by CLT, and the data were collected from Pakistani ESL learners. The main purpose of the current study was to investigate how AI tools are helpful in spelling accuracy for those who learn English as a foreign language. To gather the quantitative data, a 5-point Likert scale and closed-ended items were used in a questionnaire, consisting of 20 questions. The reason for choosing the 5-point Likert scale is that it offers the right level of granularity and ease of responding, allowing respondents to select the option of agree or disagree, which is crucial to describe the perceptions of AI tools. The data included 67 Pakistani ESL students, which is a diverse population in terms of age, level of education, and knowledge of English. This study did not collect any demographic data, but the participants were predominantly students at the university level with an intermediate or advanced level of the English language. The sampling was voluntary, and it was ensured that the information was kept

confidential. The selection was voluntary, and it was ensured that the information would remain confidential. This sample size is not large due to the time limit, and many people did not volunteer to participate. But still, it gives a significant picture of learners' experiences, and it will serve as a foundation for future studies. Researchers analyze the quantitative data using SPSS to determine percentages and bar charts.

❖ **Quantitative Data Analyses (Questionnaire Result)**

This section will cover responses of Pakistani ESL learners' access to AI tools, their overall experiences, AI's effectiveness in reducing American and British spelling variations, and learners' opinions on its impact on cognitive load. This quantitative approach is taken intentionally because it will help measure the results and experiences of learners regarding AI-assisted spelling correction in a statistical way.

Different students have different opinions; around 52.2% of learners said AI helps them a lot in improving spelling mistakes. While others say they still face difficulties as AI sometimes mixes British and American spelling, which confuses them. Almost (53.7%) of students believed that they get jumbled between British and American English spellings. Only 41.8% students noticed that AI really makes their life easier as they can easily change spelling from one variety of English to the other. This reveals that even though AI tools are beneficial, they cannot entirely solve the problem of different spelling styles. Furthermore, (29.9%) students found that feedback from AI spelling confuses them as it mixes British and American spelling rules, which makes learning complex. Additionally, 26.9% of learners observed that using AI tools requires more mental load, which can slow down learning. As Cognitive Load Theory (CLT) states that when mental effort is kept under control, learning works better. Also, AI tools are supposed to make learning easier by automatically spotting mistakes, but sometimes they do the opposite. It also adds extra mental effort when students see mixed British and American spelling feedback and makes learning harder instead of easier. This shows that AI feedback should be clear, consistent, suitable, and use one style of spelling. It should match the learner's level of language and background so that students do not get confused. ESL learners already find it hard to notice the difference between British and American English because both are commonly used in work and studies; therefore, unclear AI feedback can make learning even harder. Students often mix British and American spelling as they are not taught enough about the difference between the two varieties. So, the mixed use of spelling happens by the students, which they don't

even realize. Although AI tools can be helpful because they instantly correct mistakes, they can also create confusion if students don't get why the corrections are made.

Table 1: Students' responses regarding the effectiveness of AI tools in Spelling Variations

Sr. No.	Survey Statement	Number of Responses (N)	Percentage (%)
1	I studied English as a second language (ESL).	67	82.1%
2	AI is used for educational purposes.	67	95.5%
3	The use of AI tools made students independent.	67	62.7%
4	AI tools are useful for spelling correction.	67	52.2%
5	I face confusion between British and American spelling.	67	53.7%
6	AI helps me in correcting my spelling from British to American or vice versa.	67	41.8%
7	AI tools help students differentiate between British and American spelling.	67	67.2%
8	AI tools help improve spelling accuracy between British and American English.	67	65.7%
9	AI helps ESL students overcome spelling confusion.	67	52.2%
10	AI tools help me identify and correct spelling mistakes effectively.	67	59.7%
11	AI tools help me understand the difference between British and American spellings.	67	50.7%
12	AI feedback has improved my overall spelling accuracy.	67	61.2%
13	I find AI spelling feedback confusing because it mixes American and British rules.	67	29.9%
14	AI tools motivate me to practice English writing more regularly.	67	44.8%
15	Using AI tools requires extra mental effort while writing.	67	26.9%
16	I feel comfortable interpreting AI feedback on my spelling errors.	67	53.7%
17	AI spelling suggestions are easy to understand and apply.	67	64.2%

The maximum percentage of agreement for each of the questions is mentioned in the above table. Around 95.5% learners rely on AI-driven tools for educational purposes. Therefore, AI provides learners' autonomy. This reflects the fact that the

majority of Pakistani ESL learners agreed with the effectiveness of AI and that it reduces the mental burden of learners. It indicates that students are increasingly accepting the use of AI to develop their language proficiency. Moreover, around 62.7% students said that they feel more independent after using AI tools. This proves that these technologies foster learner autonomy among learners because they allow them to self-correct and practice their mistakes without the supervision of instructors. Most of the respondents gave a positive response regarding AI tools for spelling correction. Among all the respondents, many are unfamiliar with the difference between American and British English. Unfortunately, students did not identify the varieties of English, and they use a mixed style unconsciously. AI has become modernized; without learners' knowledge, it automatically gives spelling according to context.

AI tools have a positive impact on learners, which is evident in the research. About 44.8% learners get motivated by AI tools in their regular English writing practices. This proves that AI helps in accuracy as well as becomes a motivation for the learners to engage and acquire the English language. Further, according to results, about 64.2% learners perceived the ideas of AI as easy to comprehend, and about 53.7% learners found its feedback agreeable because AI becomes a comfortable platform for learners, which gives them confidence and reduces mental stress.

These findings on the basis of educational perspective, give fewer outcomes. For instance, it is necessary for Instructors to carefully introduce AI tools into ESL classes. Additionally, educators should minimize the confusion of learners who are unable to differentiate between British and American spelling. Spelling Errors and cognitive load can be overcome when learners receive comprehensive teaching on interpreting AI feedback given to learners.

Q 18: Which AI tool do you often use for English learning?

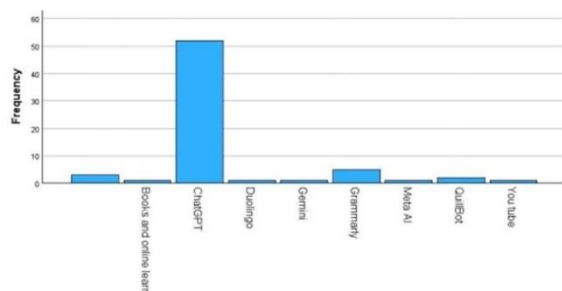
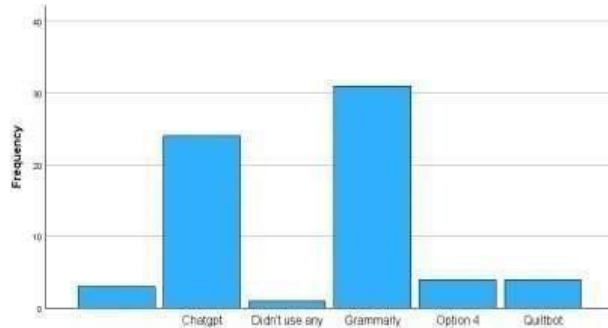


Figure 1 Frequency of AI tools

This figure shows the result of the quantitative questionnaire conducted by the researchers. It suggests that most of the Pakistani ESL learners are familiar with AI powered tools. They use various tools such as ChatGPT, Duolingo, Gemini, Grammarly, Meta AI, and QuilBot for learning aids. But among all of them, more than 50% learners use ChatGPT for learning.

Q 19: Which AI tools do you prefer for spelling correction or checking?

Figure 2 AI Tools for Spelling Correct



This figure demonstrates the result of a quantitative question. It highlights that Pakistani ESL learners use ChatGPT, Grammarly, and Quillbot for spelling accuracy. But among them, most use ChatGPT and Grammarly to enhance English language learning. These tools help them improve their spelling errors and overcome their mental stress. This result aligns with the researchers' research objectives that AI tools like ChatGPT and Grammarly help Pakistani ESL learners in spelling correction by providing them less mental load.

Q 20: Which form of English do you use frequently?

	N	%
American English	13	19.4%
Both	18	26.9%
British English	15	22.4%
You don't notice a difference	21	31.3%

Figure 3 Frequently use English form

This table illustrates that mostly Pakistani ESL learners do not find any difference between the two varieties. Around 31.3% learners did not notice any difference, so they prefer the mixture of both. In Pakistan, British English is more widely used than American English. There are two reasons for this. The first is the colonial legacy, and the second is that the Pakistani curriculum follows the Oxford and Cambridge system.

Semi-Structured Interviews

The qualitative approach was conducted for semi-structured interviews. 13 undergraduate ESL learners were chosen for a face-to-face interview. The duration was about 3-5 minutes. Out of the 3 thematic sections (effectiveness, experience, and suggestions regarding AI tools), researchers took different questions based on our research work. The first question asked the participants, was Which AI tools do you use mostly to check spelling? The responses prove that all participants utilize AI tools for educational purposes. Interviewers use different tools such as ChatGPT, QuillBot, Duolingo, Perplexity, Grammarly, Gemini, and Meta AI. ChatGPT is commonly used among all of them because it has various functions, such as being free and easy to use, while others have limited functions, which restrict their use. This connects with the previous studies that ChatGPT provides quick feedback and suggestions that can help students in writing, grammar, and vocabulary, thus enhancing their overall expertise in the target language (Klimova et al., 2024). The next question was: To what extent do AI tools assist you in distinguishing between American and British spelling? Most of the participants did not even know the proper difference between the two varieties. They answered that the mixed style is used because they can use it according to their convenience. This is parallel with the result of previous studies that native speakers mix both kinds of English unconsciously (Novari et al., 2021). Thus, they do not strictly follow one of them. On the other hand, some of them knew the difference, and they used British style because in Pakistan, British English is preferred over American English. The third question was: How many spelling errors are improved by using AI? Many participants have different opinions in this regard. Some said that they know basic English at this level, so according to them, their spelling errors did not cause any problem. But few of them said that using ChatGPT and Grammarly, they did improve their spelling mistakes as these tools instantly give correct spellings. They enter answers, and these tools provide them with quick feedback to correct any errors. This links with the earlier research that demonstrates that ChatGPT and Grammarly help learners in language proficiency (Shahid, Khan, & Rao, 2024). The

fourth question was: Do AI-based tools enhance learner autonomy? Students accept that AI tools give them autonomy because they do not always need a mentor for guidance. AI tools are enough to take them in the right direction. The earlier research also emphasizes that AI makes students active learners instead of passive ones (Altaf and Shaheen, 2025). Additionally, students also accept the fact that too much reliance on AI technology will lead to disrupting critical thinking. The last question was: Which AI tool do you suggest to ESL learners for spelling accuracy? Why or why not? The interviewees recommended various tools, such as Meta AI, ChatGPT, Grammarly, and Duolingo, for spelling mistakes. Also, this suggestion aligns with the previous researchers' findings that AI tools such as Grammarly, ChatGPT, Duolingo, and ELSA can improve the Pakistani ESL learners' language enhancement (Shahid, Khan, & Rao, 2024). According to them, these tools play an effective role in improving ESL learners' language proficiency, such as reading, writing, listening, and speaking.

Discussion and Findings

English is not an indigenous language in Pakistan, but it is learned as a second language. As one critic stated that English has become important because it has gained international significance (Ali et al., 2020). The 21st century is so modernized; English holds great global importance for educational settings. The findings of this study gave valuable insights into the usefulness of AI-based techniques in enhancing the spelling accuracy between both varieties of English language learning experiences among Pakistani ESL learners. The results of this study reveal that learners found AI-based tools to be productive in providing unique feedback and learning opportunities, which enhance their knowledge. The result of this study is given below:

Referring to research question 1, the result of this questionnaire shows that about 52.2% participants claim the usefulness of AI tools in spelling correction based on the context. This percentage suggests that more than half of the audience relies on ChatGPT. The response of ChatGPT inclusively embraces the crucial parts that characterize good quality feedback, and includes strong, cognitive, and positive aspects (Kerman et al., 2022; Patchan et al., 2016). This emphasizes the notion that the learners are overly reliant on ChatGPT and Grammarly to unburden themselves. It also leads to learners' autonomy, which makes them motivated and self-efficient. In early research, one critic explores that these tools act as a Pro Writing Aid for learners (Fitria, 2023). Thus, this study is similar to the responses of the conducted survey. During the interview, one participant stated that these tools help improve

their Basic English, but too much reliance is a bad thing. Another noted that Grammarly is beneficial for spelling correction. This finding is similar to a previous study, which has shown that these tools not only guide them in spelling accuracy but also assist them in suggestions that make them self-confident (Shahid et al).

Further referring to research question 2, the result of the questionnaire shows that about 31.3% participants do not notice any dissimilarity between both kinds of English, so they follow a mixed style unconsciously. For instance, some of the words, such as color/colour, analyse/analyze, and favor/ favour, etc., learners use these words randomly in the language. About 52.2% respondents claim that AI tools help them in overcoming spelling confusion because AI itself corrects their errors without their knowledge. From this, researchers can argue that auto-correction mode can help for the short term, but it is not beneficial for the long term. It can be maintained in such a way that a person should ask for spelling errors first, rather than auto correction, and then memorize them for their future. In a face-to-face interview, one participant stated that she used British English because she finds it easier. In contrast, another participant said that she is not confused because, till now, she is unaware of the exact difference. AI tools should also be used to differentiate between American and British spelling, and ESL learners should take help from them to clarify the difference. These findings are somehow linked with the previous studies that English is a worldwide language spoken in different countries, but still, many native speakers find it confusing due to its two varieties. (Barata, 2020) Referring to research question 3, the study shows that Cognition is an active mental process, as stated by Jean Piaget (Thompson, 2017). The result of the questionnaire shows that about 64.2% participants believe that using AI tools makes their work easier without extra mental effort. Furthermore, during the interview, one of the participants assured that she feels 70% confident in the effectiveness of AI tools because they help her in reducing her mental load. While another participant noted that "I have been a content writer, so I do not use AI". This informs that there are also other ways instead of AI tools to improve Pakistani ESL learners learning and reduce cognitive load, sticking to AI is not just a good solution. These findings are related to previous studies, which identified that the majority find AI as a time-saving tool in completing their task without giving any mental stress (Khan and Ghani, 2024)

Conclusion and Recommendation

In conclusion, artificial intelligence-powered tools are productive and friendly in enriching Pakistani ESL learners' knowledge about spelling variations between American and British English. This study investigated how AI tools such as ChatGPT and Grammarly are helpful for learners. The findings show that students these days use AI tools, and these tools are very beneficial for them. By utilizing AI-powered tools, they can easily notice their errors and correct them accordingly. This research received positive responses regarding these tools, as it is free of cost, easy to use, and available every time. Along with this, the majority claim that using these tools is not harmful, but completely relying on them blocks students' own learning capabilities. Moreover, these tools help in enhancing spelling accuracy. Also, the study's mixed method approach gives a rich and valuable insight into the participants' perceptions of AI-based tools, serving as a medium for future research.

The researchers' study on how AI helps Pakistani ESL learners to reduce spelling confusion between British and American spelling, and how it reduces mental load. Furthermore, future researchers can study how AI tools contribute to affect students' spelling and learning. They should also study which tools are way better for students to reduce spelling confusion and provide correct and immediate feedback. They can work on how traditional teaching methods and these advanced AI tools blend so that students don't have to rely too heavily on AI and can also learn independently. Also, they can benefit from teachers' guidance and advanced technology. Make students aware of the difference between different kinds of spelling so that they don't get too confused. Future researchers can explore how ESL teachers introduce various methods and lectures on how AI tools should be used in classrooms to foster English language skills among ESL learners. One critic argues that to promote awareness about the advantages and hindrances of AI-based tools, there is a need for policies that support their integration by providing funding for further research (Warschauer, 1997; Egbert, 2005). Despite obtaining positive results, there are certain limitations in this study. The study is geographically delimited to Pakistan, and its findings do not apply to a broader area. For future researchers, it is mandatory for them to apply their research to a larger area, along with a qualitative approach for examining in depth learners' experiences.

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