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FROM CHALK TO CLICKS: DEEPSEEK AS A CATALYST FOR ELT TRANSFORMATION IN KHYBER PAKHTUNKHWA

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Abstract

This research investigates the perceptions of EFL teachers regarding the integration of DeepSeek into English Language Teaching (ELT) practices, examines the pedagogical benefits that DeepSeek may offer for students and ELT practitioners, and explores the challenges associated with the utilisation of DeepSeek in the ELT context of Khyber Pakhtunkhwa. The study also aims to examine the familiarity of the tool among teachers, as well as the difficulties they encounter when using it. The research employs survey and interview techniques to gather insights into the experiences and perceptions of teachers. Specifically, out of 50 interviewees and surveyed, 67.2% had used DeepSeek previously, 29.4% had never heard of it, and 3.4% were unsure. Additionally, 12 teachers were interviewed in detail to provide qualitative insights complementing the quantitative data. Most teachers had used DeepSeek and found it helpful for professional development. According to survey data, more than 75 per cent of those interviewed rated the platform as very useful, 20 per cent as somewhat helpful, and only 5 per cent as not applicable. Regarding its application to ELT, 86 per cent of teachers considered DeepSeek to be very useful, 9 per cent found it helpful, and 5 per cent found it not beneficial. These results provide strong evidence that DeepSeek can increase the number of resources and instructional strategies that teachers use. DeepSeek has significant potential to transform the teaching and learning of English in higher education institutions. It has demonstrated its ability to enhance student engagement, support effective teaching practices, and help teachers improve their professional skills. While particular challenges exist, the tool is not useless and shows promise for broader adoption.

Keywords: *DeepSeek, English Language Teaching (ELT), instructional strategies, pedagogical benefits.*

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1. Introduction

Education is undergoing radical change, driven by the rapid growth of artificial intelligence (AI) applications. AI is no longer seen as a mere imitation of human intelligence; instead, it has become an inevitable and irreplaceable part of modern educational systems. According to Tan (2025), the application of AI is being adopted universally in a manner that attempts to customise the modelling of education for individuals, simplifies teaching patterns, and even makes good education highly accessible to most individuals. Not only is it a change in technological paradigm, but it is also an epistemological paradigm shift, as the nature of what knowledge is and its constructions, including globalisation and interiorisation, changes. The conversational artificial intelligence application, which is called DeepSeek, has been presented as one of the newest innovations that the community of researchers took interests in, due to their capabilities to alter not only the pedagogical process in the educational setting with the existing imbalance, but also in the area with the Khyber Pakhtunkhaw (KPK) in Pakistan, where the problem of infrastructural limitations is present. DeepSeek is an ambitious initiative that Pakistan can undertake, given that the country is still on the learning curve of digital transformation. Hussain and Zahra (2024) argue that this initiative aims to improve the quality and independence of language instruction while reducing systemic failures in access and quality.

DeepSeek's introduction and subsequent implementation of AI in the education sector in Pakistan will help alleviate the gap in English proficiency. Oshodi (2024) believes that DeepSeek can be integrated into the existing system, focusing on the needs of students by filtering information pertinent to them based on their profiles. The introduction and implementation of AI into the education industry in Pakistan is not a quick or instant process. Still, it takes place in a realm of education that is already lagging in terms of infrastructural measures and pedagogical preparation. The proposed introduction of the National AI Policy is a specifically foreseen tactical change by the government, giving the impression of a digital transformation as it attempts to establish a hybrid intelligence model and environment in which machines and individuals will work in a symbiotic cycle (Fatima, 2025). Basit (2024) highlights that although China and the United Arab Emirates have low scores in international rankings measuring the level of preparedness and advancement of AI, the actions conveyed by the state regarding the necessity of educating

one million AI professionals by 2030 underscore the vast reorientation of the country's education focus. Al-Shahrani (2023) points out that those obstacles, nonetheless, have kept online education at bay, with effects on internet connections, an interrupted and disjointed curriculum, and the adoption of the rote-lecture approach, resulting in years of unimpeded growth. Amin & Uddin (2023) reveal that the Khyber Pakhtunkhwa (KPK) region, therefore, had the potential to constitute an ideal microenvironment for introducing AI-assisted English Language Teaching (ELT). Still being historically confined by the classical notion of devoting special attention with the help of the Grammar Translation Method, the ELT professionals in the discussed sphere have not only failed to produce the awareness of the notion of communicative competence and critical thinking, but have also proved incapable of instilling the awareness of these concepts and practices in learners. Moreover, DeepSeek is open-source, and thus, promoting it to the corresponding environment becomes easier, which means that manipulating the instruction contents is simplified in accordance with the language's peculiarities and cultural principles (Bin Hadi et al., 2024).

To sum up, the case of DeepSeek adoption within the ELT environment of KPK presents a negative dialectic between institutional innovation and adaptive practice as it was implemented. As Hazaymeh et al. (2024) conclude that the implementation represents a larger transition in educational practice, and it requires more than technical comfort with technology; rather, it necessitates constant pedagogical reflective practice. As Pakistan undertakes the reconfiguration of its educational system, tools like DeepSeek may become catalytic in achieving language capabilities and epistemic justice.

The following are the research objectives:

1. To investigate the perceptions of EFL teachers in Khyber Pakhtunkhwa regarding the integration of DeepSeek into English Language Teaching (ELT) practices.
2. To examine the pedagogical benefits that DeepSeek may offer for students and ELT practitioners, as identified by English language educators in Khyber Pakhtunkhwa.
3. To explore the challenges associated with the utilisation of DeepSeek in the ELT context of Khyber Pakhtunkhwa

2. Literature Review

The mainstream use of artificial intelligence machine technologies, which inevitably finds its way into mainstream education, represents a paradigm shift in the field of education. Rather than being relegated and confined to daily household tasks, AI serves as a present-day interactive learning companion in the educational process. **Jumanov et al. (2023) argue** that updating learning theory is necessary to match this paradigm shift. DeepSeek is such a platform; it is an unprecedented and untested conversational AI platform that has already been introduced. Having addressed the instructional gaps that

have arisen due to low capital outlay in the Khyber Pakhtunkhwa region, resulting in learning inequalities among the people, DeepSeek may be utilised to close the instructional gap. **Hussain and Zahra (2024) suggest** that AI systems can offer personalised curriculum routes, comments to learners, and context-based feedback, thereby reducing the workload of instructors and dignifying learners. The scholars employed a triangulation technique to compare data gathered from interviews with teachers and audits of policies and national statistics sites, with the intention of demonstrating how DeepSeek can rejuvenate English-language teaching.

Focusing on open-source modalities in general, Basit (2025) claims that, given the opportunity to explore new pedagogical approaches, school systems often face limited budgets due to the presence of AI systems. The aggregate results of these studies indicate that AI must be viewed with a great deal of innovation, as not only a tool that is effective and developed, but also a weapon that can introduce changes to make Pakistan a more just and effective place to study and speak a language. **Ali (2025 asserts** that AI will revolutionise learning by promoting efficiencies, participation, and differentiation. Yet, **Faud et al. (2023) warn** that insufficient domestic content production and linguistic limitations may hinder inclusivity. **Ateeq et al. (2024 demonstrate** that learners can memorise vocabulary with higher confidence when interacting with DeepSeek compared to traditional corpus interfaces, while teachers benefit from reduced cognitive load and greater agility in pedagogy. **Dewi et al. (2020) emphasise** that scaffolding enhances these outcomes, enabling both students and teachers to thrive in digitalised academic landscapes. In the sphere of the educational process, the presumptive use of AI solutions, particularly natural language processing and machine learning, is regarded as a priority in AI technologies (Waleed et al., 2024). As Wang et al. (2024) highlight, with the adoption of algorithms capable of questioning vast quantities of data, discovering patterns, and drawing conclusions, AI-enhanced systems enable an instructor to deliver personalised learning to students. There may be several positive consequences, which are generally anticipated to be extended through AI during the learning process. The most optimistic one is the possibilities of one-to-one learning. The students can acquire content in their learning path in spaces that suit their learning profiles. According to Zhai et al. (2024), this capability also provides teachers with more reporting facilities, allowing them to observe individual progress to a certain level of precision. It may also be possible to automate instruction provision and build efficacy, as well as reduce the workload of faculty members, providing more timely and precise feedback to learners. The issue of artificial intelligence continues to receive substantial scholarly and practical attention from the education sphere (Shivangi, 2020). The introduction of DeepSeek among the English classes of KPK can, therefore, be viewed as both an opportunity and a challenge.

Its metamorphoses, to the extent of the long-term caveats regarding its pedagogy, i.e., its homogenisation under the influence of, namely, infrastructural installation, teacher standards, and making policies concrete, are subject to its esterification (Chen et al., 2022). However, this is not a simple task. Dilmouroud (2021) highlights that short-term obstacles include the digital illiteracy of the majority of instructors, the fact that many rural regions lack well-developed infrastructure, and the sociocultural challenges that prevent a large group of learners from utilising algorithms to mediate learning. Al Tkhnayneh et al. (2023) suggest that using AI-assisted tools like DeepSeek not only personalizes the learning environment but also presents the content in an adaptable way and supports with instant feedback, which is incredibly helpful in low-resource settings. Jamshed et al. (2024) emphasize that integrating AI systems, specifically DeepSeek, into the educational framework of Khyber Pakhtunkhwa (KPK) will pave the way for a more balanced, efficient, and competent approach to language teaching. A more thorough analysis will enable educators to make better decisions. With the assistance of AI-inspired administrative systems, the chances of entry into the field of learning will increase, as it will become diversified and personalised. Consequently, the increasing use of AI in education administration and instruction delivery is consistently reflected in contemporary studies.

3. Methodology

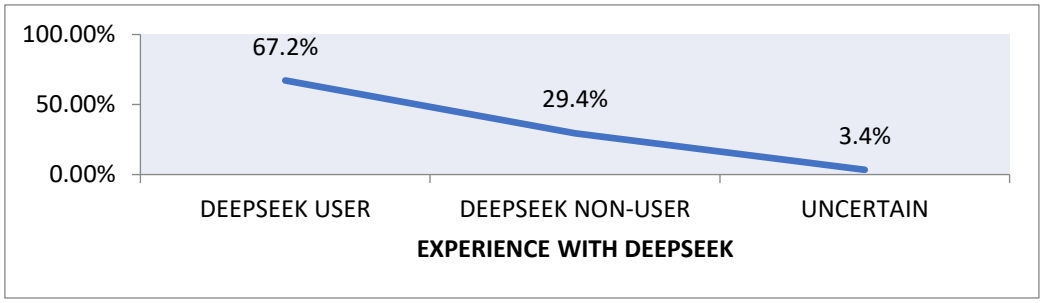
The research on English language pedagogy in Khyber Pakhtunkhwa used a mixed-methods approach to evaluate the effectiveness of DeepSeek in higher education. The study surveyed 50 EFL teachers from colleges or universities in Bannu, Lakki Marwat, Kohat, and Peshawar, comprising 80% male and 20% female participants. Qualitative data were collected through interviews with 12 teachers. A mixed questionnaire featuring both closed- and open-ended questions was developed and refined through a pilot study, and then distributed online. Quantitative data were analysed using SPSS, while qualitative data underwent thematic analysis involving coding to identify patterns and themes. This blended methodology enhanced the study's comprehensiveness and validity.

4. Results & Discussion

4.1. Quantitative Results

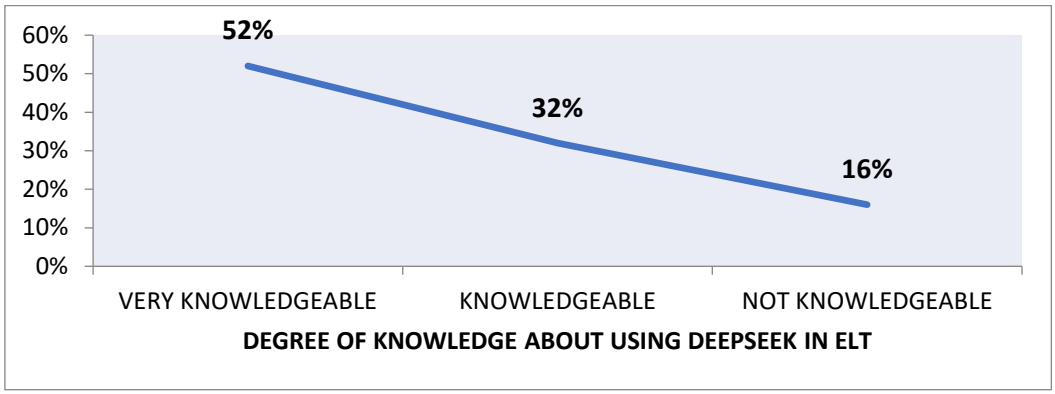
4.1.1. Descriptive statistics

CHART 1. **Experience with using DeepSeek among respondents**



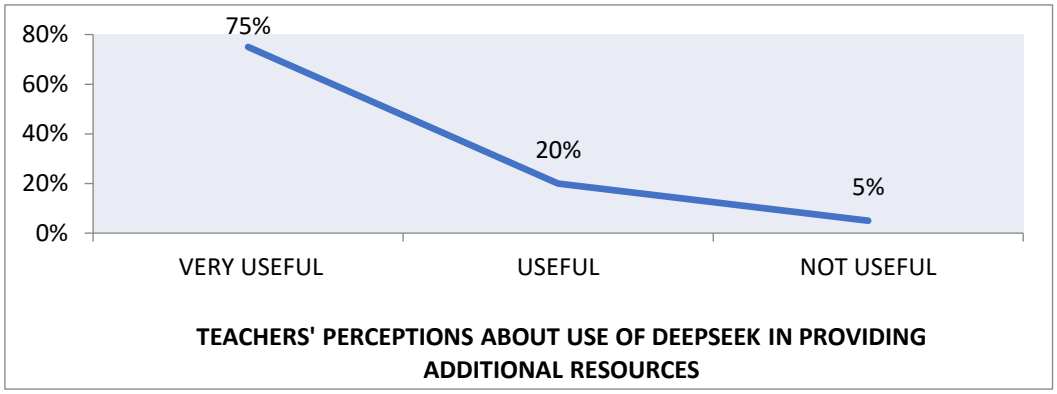
According to our survey, a high percentage (67.2%) of participants report using DeepSeek, indicating a relatively high level of acquaintance with the platform. However, a substantial minority, 29.4% to be more precise, have not had any contact with it, and another 3.4% answered with uncertainty, indicating that they have had less direct contact or knowledge about it. It is essential to note that, although some instructors were willing to learn more about DeepSeek, a hint of reluctance remains regarding its long-term integration into English as a foreign language (EFL) teaching repertoires.

CHART 2. The degree of knowledge about using DeepSeek technology in English Language Teaching (ELT)



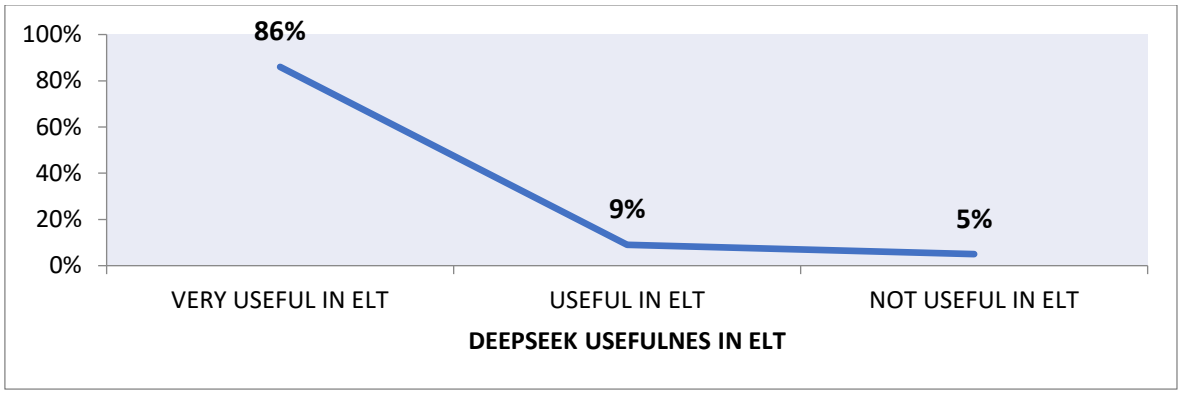
A recent survey examined the depth of knowledge participants have about DeepSeek in teaching the English language. The numbers reflected a continuum of engagement to the extent that 52 % of interviewees recognised themselves as very knowledgeable, with strong expertise and conviction in utilising the platform; 32 % of the interviewees understood themselves to be knowledgeable, with good but possibly more limited knowledge base; and 16 % understood themselves as not knowledgeable, with little or no experience of utilising DeepSeek in teaching approaches.

CHART 3. Teachers' perceptions about the use of DeepSeek in providing additional resources



Among the respondents, three-fourths of the sample (75%) found DeepSeek very useful in providing language teachers with extra resources to develop their professional growth, which reports significant support for the importance of DeepSeek on the development of teachers. Twenty per cent of respondents, when admitting to utility, identified DeepSeek as simply applicable, and thus, a lower, albeit satisfactory, degree of confidence in the effects of DeepSeek on professional development has become evident. The other 5% found the platform not helpful, which would imply that they did not have much confidence in its ability to aid teacher learning.

Chart 4. The level of agreement with the statement about DeepSeek 's usefulness in ELT



These percentages above represent the distribution of responses among the participants. It indicates the level of agreement or disagreement with the statement about DeepSeek's usefulness in ELT. Most respondents (86%) agreed that DeepSeek can be 'very useful' in ELT. Additionally, 9% agreed that it is 'useful' in ELT. On the other hand, 5% of respondents indicated that it is 'not useful' in ELT. It is worth noting that the data provide insights into the beliefs and opinions of the participants regarding the potential usefulness of DeepSeek for language teaching. However, it does not provide information about the specific reasons behind their responses or the rationale for their beliefs. Further qualitative

analysis or additional information would be needed to delve deeper into the participants' perspectives on the topic.

4.2. Qualitative Results

The perception of EFL teachers regarding the integration of DeepSeek into ELT

The perception of EFL teachers regarding the integration of DeepSeek into English language teaching reveals an extensive range and is therefore worth scrutinising. The general reaction to the idea was ambivalently optimistic, with a full realisation of the disruptive potential of the concept, while also seeing its potential in the pedagogical discourse of the time. The respondents in the urban institutions defined DeepSeek as a fresh innovation that could revive the lives of learners. Many of the comments noted that the tool provides students with a sense of ownership, allowing them to feel that they have some control over what they are learning, which was not present in the old, chalk-and-talk techniques. In this way, the concept of learner agency was especially relevant in cases where rote instructions were predominant within a classroom setting.

On the other hand, there is a minority who showed reluctance, in particular, the teachers with more rural backgrounds. The reservations they had were mainly based on a lack of familiarity with AI systems and a fear that DeepSeek would interfere with instructional control. Among the respondents, it was noted that the classroom is a human environment and that, if the robot starts to give feedback, what will be my position during this event? In this commentary, it was clear that professional identity dissolution and pedagogical loss of control were far more deeply rooted. Interestingly, a few respondents referred to DeepSeek as a colleague, rather than a rival, thereby suggesting that both teachers and AI should cooperate in the future, rather than replacing one another. The cumulative perspective of the survey reveals a broad range of insights, including brimming and thoughtful individuals. The level of receptivity is connected with institutional culture, as well as the digital exposure and the teaching philosophy of an individual. It can be concluded that students will have access to authentically contextualised and real-life practice in English through a critical approach to existing empirical evidence. To this fact, one can add a discovery that suggests AI language systems, such as DeepSeek, might tailor their output to the needs and profile of users, thereby offering them personalised feedback and suggestions, which may include interactive interactions with the AI. As an EFL pedagogical concern, the individualisation aspect is likely to be well-received by practitioners, as it will provide them with the opportunity to offer the appropriate level of support to areas where students identify trouble and correct the processes on the spot. Moreover, DeepSeek can be used as a language input repository, allowing instructors to serve students realistic patterns of language use that take into account language, culture, and pragmatics. These patterns will be developed based on dialogues, writing essays, and

sample conversations provided by DeepSeek. This exposure is particularly relevant when the tool is integrated into learning operations that diversify the traditional boundaries of classroom learning activities. The students can stay in touch with DeepSeek and subsequently apply the knowledge they have obtained to face-to-face or even synchronous communication, thereby making unrestricted learning much faster.

Additionally, DeepSeek can be used as an adjunct to classroom learning to create an environment that fosters active engagement. The value of the system also lies in the writing of testing resources such as tests, quizzes, and passages to comprehend (where the linguistic needs are recreated in real-life communication situations). Finally, DeepSeek can be employed to foster the further professional development of the EFL instructional staff, support them in enhancing their linguistic and professional understanding, and refine their repertoires.

4.3. Pedagogical Benefits Identified by EFL Educators

The second step of this investigation was to examine the pedagogical benefits of DeepSeek, as reported by teachers of English as a Foreign Language (EFL). All the gathered stories were successfully positive and contained many demonstrative examples. The ability of DeepSeek to provide feedback in real-time was another attribute that piqued the interest of many respondents, particularly in situations where one-on-one support was difficult to organise. A teacher who used DeepSeak with her students reported that, when her students requested DeepSeak to correct their sentences, they not only received the correct sentence but also an explanation of why it was not written correctly. This process of reflection was considered one of the essential benefits, as it allowed learners to internalise linguistic rules through iterative feedback.

Another helpful feature was that DeepSeek aimed to replicate realistic conversations, a feature that many teachers identified as effective in developing oral fluency. One of the participants of a semi-urban college said, "*My students will consult with DeepSeek before speech tests. They were more assertive and not shy in the classroom."* This low-pressure rehearsal room allowed students to make mistakes and improve their skills. Teachers also mentioned that the workload had been reduced because DeepSeek was able to automate many questions that they had to do manually, incidentally correcting feedback in the form of writing or even creating quizzes. Another teacher described the advantage as such: *"It can be regarded as an assistant; I use it to pre-check the materials that I want to distribute to students."* Collectively, these answers suggest that DeepSeek facilitated the provision of differentiated instruction, allowing teachers to deliver effective instruction without compromising the quality of English-language teaching experiences.

4.4. Challenges in Utilising DeepSeek in the KPK ELT Context

With the adoption of DeepSeek in the KPK ELT situation, some system and instructional issues have become apparent. The first thing that comes to the mind of educators is the ever-present infrastructure deficit. Educators in the more distant regions report a constant internet connection, poor equipment supplies, and a corporate attitude toward technology integration, which the teachers of these institutions refer to as a lack of technological investment. As one respondent reported, 'We are lucky if we have one computer lab serving 400 people, and I, too, cannot access it at times.' Conditions like these cause damage, even to the most committed efforts towards new technologies.

At the same time, digital literacy appears as a second considerable obstacle. A significant number of teachers require a reliable guide to utilise the platform effectively. Others use professional development activities to gain confidence, and some use the technical-savvy students or colleagues as informal mentors. There is also resistance based on cultural differences, both within the educational institution and in the broader community. The respondents provide affirmation, with a few mentioning the scepticism on the part of administrators and parents regarding the use of AI in English teaching. As the testimonial from one teacher confirmed, I had to make it clear that DeepSeek was not going to replace me, but rather assist me, and that a long-term awareness campaign and policy agreement were necessary.

Ethical aspects also have more depth. Teachers are concerned about the excessive use of DeepSeek, rather than active learning, and an uncritical attitude toward the results of AI work. Various respondents emphasise that students should not regard the trajectories suggested by the platform as infallible and should instead question and follow up. In this way, the issue of technical availability is not the only difficulty to be tackled, as it concerns epistemological ones: how to teach students to be critical in their use of digital tools, inheriting a tradition where teachers were in control of the learning process. Taken together, these findings provide some evidence that DeepSeek can be viewed as a complementary tool and that its integration should be supported by long-term professional development, valuable infrastructural support, and instructional protection. We must remember that DeepSeek relies on the other key building blocks of language acquisition, which include face-to-face communication, interactive content, and authentic and meaningful use of language. A slightly less than insignificant number of respondents suggested that such dependence can dull the creativity of teachers, with one respondent fearing that DeepSeek can also have an adverse effect, making teachers and students lazy. This point raises two more issues: that of laziness and plagiarism. ELT professionals considered DeepSeek to be ultimately useless to them, as, based on their perceptions, the application does not address the particular needs of learners. Interviewing one such teacher, I noted that DeepSeek does not support the variation of learning tasks and unique activities to meet students' varying needs. Therefore, certain classroom teachers would

claim that DeepSeek is inadequate when it comes to addressing the diverse learning styles, proficiency levels, or individualised goals in language.

Furthermore, a significant minority of respondents expressed doubts about the reliability of the content generated by the system, citing inaccurate and unreliable findings, incorrect information, distorted facts, and even fabricated references. However, these constraints cannot be exaggerated too much, because many respondents concerned with ELT realise that there are no constraints in the current usage of DeepSeek. After all, it is still under active development or has not yet been sufficiently applied in practice. They should not be concerned because their reservations can backfire someday due to the development of technology.

5. Summary of Findings

The given research employed a mixed-methods research design to investigate the practical applicability of DeepSeek in the context of teaching English. Specifically, in a survey targeting 50 interviewees, the following data were obtained: 67.2 per cent had tried DeepSeek before, 29.4 per cent had never heard of it, and 3.4 per cent provided uncertain answers to the question. The figures indicate that DeepSeek has achieved a modest distribution rate, but it is in no way common among English as a foreign language instructors. According to the survey results, the DeepSeek's overall contribution to professional development was overwhelmingly positive. Approximately 75 per cent said that they found the platform very useful, 20 per cent found it applicable, and just 5 per cent said it was not valuable. The same tendency was observed when the teachers were asked about the usage of ELT: 86% of the teachers considered DeepSeek very useful, while 9% and 5% answered that this tool could be helpful or not helpful, respectively. These results demonstrate the robust evidence of DeepSeek's capacity to expand the array of resources and teaching techniques available to teachers. The qualitative part: Twelve teachers were selected for in-depth interviews to provide a multifaceted overview of their experience with the technology and offer further explanation of the quantitative question. Respondents in an urban environment reported DeepSeek as a welcome innovation that encouraged learner autonomy. They lauded the fact that it provides immediate explanations and feedback, which they regarded as crucial for students to understand grammatical principles. These interactive exchanges were also characterised as reflective, which became a possible pedagogical strength. By contrast, participants at the rural locations mentioned various barriers, in particular, unstable internet and hardware shortage, along with a lack of institutional support. Persistent infrastructural difficulties accompanied the promise of DeepSeek for these educators, even when the users were highly motivated to use the platform. The technological integration gap in some colleges and universities is thus a persistent problem that stems from a lack of investment in digital infrastructure.

DeepSeek could revolutionise the way English is taught in Khyber Pakhtunkhwa and become a key component of the modern language learning process. Although the current study reveals that the overall level of competence demonstrated by university instructors using the DeepSeek platform appears to be relatively high, it also highlights a significant difference in access, level of familiarity, and institutional support. A considerable portion of the minority remains unfamiliar with or reluctant to use the tool, often citing infrastructural constraints or a lack of exposure as the reasons. The urban-rural digital divide is a significant barrier to the equitable use of educational technologies, with implications that are persistent and very real. Teachers working in rural locations often face challenges such as poor connectivity availability, limited hardware resources, and a lack of options for upskilling, which hinders the successful implementation of DeepSeek in classrooms. In addition, the qualitative data derived from the interviews identify the ultimate role of the contextual factors in shaping the perceptions and experiences of the teachers. Even though DeepSeek has been widely assumed to be a pedagogical innovation capable of revitalising current English-instructional practices, its positive results are reliant on administrative support, technological readiness, and the agency of teachers. Unless there is a structured emphasis on the existing issues, it is possible that the space occupied by the platform will not be used to its fullest potential.

6. Conclusion

The indicators suggest that DeepSeek is regarded as a valuable resource for teaching the English language. Most educators claim to have used the tool and feel confident that it is beneficial to both students and instructors. DeepSeek facilitates education and encourages student-centred pedagogies. Nevertheless, despite the apparent benefits, the tool is not entirely incorporated into every teaching scenario. Some access and insufficient training limit the accessibility of others, and technical limitations on other teachers limit its regular use. It is also necessary to solve these problems to make DeepSeek more widely adopted. DeepSeek has vast potential to transform the process of teaching and learning the English language in higher education institutions, as it has already demonstrated its ability to enhance engagement, support teaching, and help teachers improve their practice. Yet, system-wide efforts are required to address both the current barriers and to create a facilitating environment for the extensive and comprehensive implementation of the platform. The most valuable aspect of the study's proposed idea is the plan that can be shared with all educators, regardless of their geographical location or available resources, to experience the opportunities that DeepSeek unveils.

7. Recommendations

1. Conduct frequent training seminars to shape the competence of the teachers in the use of AI.

2. Enhance digital infrastructure and the internet in the rural and underserved schools.

3. Promote cooperation among the educators to share best practices and experiences with AI.

4. Include AI in the formal curriculum planning process so that the institutions can widely adopt it.

5. Carry out more research on the long-term effects of DeepSeek on the learning outcomes of the students. Provide regular training workshops for teachers to improve their skills in using DeepSeek.

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