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Exploring English Language Teachers' Perceptions Of Computer-Assisted Language Learning At The Primary Level In District Karak, KP



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Abstract: *The purpose of this research was to explore the perception of English language teachers towards computer assisted language learning: a study at primary schools in district Karak, KP. The research explored teachers' perceptions and actual use between perceived usefulness ease of use, organizational support and barriers for implementation of CALL in English Language Teaching. The research study used a convergent parallel equal status design and collected quantitative data through closed ended questionnaires, and qualitative data through open ended questionnaires. The study was conducted on a sample of 30 English teachers selected through stratified random sampling whose goal is to get equal ratio from the enrolled in remote and urban schools. To answer the research questions and to analysis the differences in perceptions of respondents across categories on different demographic and situational attributes, descriptive statistics, t-tests and ANOVA were employed. The research also found that teachers had a positive attitude toward CALL in terms of its efficiency as a language learning tool, and its benefits on student's motivation, and effectiveness of instruction. The results suggested no surprising differences due to the perception of gender, but large differences among teachers urban vs. rural camps as well as trained and untrained on the components pointed at emphasis put on exposure to and training of components. The study also confirmed the greater negative effect of systemic causes of teachers' resistance towards CALL embedded materials than teacher factors. The analysis also described teacher supply and resource centres, more training teachers and activist style policies as targeting least discrepancy in technology access. By moving the marked systemic issues identified, CALL could be introduced as functional workable and sustainable to improve more through good quality of education in general and teaching of English in particular in the more limited resourced Karak districts.*

Keywords: Computer-Assisted Language Learning (CALL), Teacher Perceptions, English Language Teaching, Primary Education, Khyber Pakhtunkhwa

Introduction

1.1 Background of the study

It may not come as a surprise that technology is a double-edged sword that indeed transformed the way we work and live. Just a few decades ago, folks would never have guessed that technology would come to

dominate just about every aspect of daily life. In this day and age our lives are computerized down to near every second now. They were a natural evolution in how we live our lives for tools that are technologically-based. Language Learning is known as Integration Technology (CALL). For the last decade or so, CALL has

been emerging as an essential part of language learning. In general, CALL can be summarized as “using the computer in teaching and learning of language and examining programs available for it”. CALL has to do primarily with how computers can function as teaching tools for the actual language material. “CALL was defined as all forms of language learning or teaching through the use of computers” in 1995 by Schofield (Andujar, Salaberri-Ramiro, & Martínez, 2020).

1.2 Technology in English education

This line between previous specializations of MALL and CALL, however, no longer exists in TELL schools. They work in concert to provide students with an integrated learning experience. Certainly compared to previous specialist ideas of MALL and CALL, TELL covers the full range--from online learning, distant education and distributed learning all the way up to virtual environment, Learning Management Systems (LMSs) on Internet, web 2.0 platforms or massive open online courses (MOOC); from teaching asynchronous or asynchronous e-Learning using any one of those different media at a time through blended and flipped ii wei both include an element of on-campus inter in addition to off-campus study all the way up to SPOCs (small private online courses) as well Personalized Independent Studies as methods of PAN (Post-Tert academic Networking). So, any so-called digital distraction used for formal or informal learning (inside or outside the classroom), falls under the overall heading of TELL (Technology Enhanced Language Learning, Marijuan & Sanz 2017).

1.3 Background of the Study

Its arrival has upended language learning. Computer-Assisted Language Learning (CALL) is the forerunner of these changes. Using computer technology for teaching a foreign language, aims to be more simple and efficient (Chapelle, 2001). CALL includes everything from multimedia software packages (e.g. macromedia, adobe, etc.), online sites, interactive language games and virtual classrooms. All of these tools seek to create a

communicative and intuitive forum for learning, accommodating multiple learning styles and requirements (Hubbard, 2009). The extent to which the teachers these technologies determines CALL effect. Teachers’ understandings and attitudes towards CALL are also vital in some way as it is they who are effectively introducing the tools into a learning context (Murray, 2014). Such insights into the beliefs of teachers towards CALL have the potential to provide useful information about the affordances and barriers of implementing CALL in various educational systems. Since studies are demonstrating the possible benefits of CALL, more and more attention has been paid to the impact of it on language instruction in recent years. Warschauer and Healey (1998)Notes that learners have been found to achieve higher language proficiency levels, as well as more enthusiasm for studying the content when exposed to CALL. CALL tools also facilitate individualized learning experiences and immediate response: specific strengths for language use that could be particularly beneficial (Kim, 2014). Nevertheless, teachers’ confidence in using technology, the amount of resourcing available and the level to which they have been trained also influence CALL implementation (Blin & Munoz, 2010).

1.4 Statement of the problems

Hubbard (2009) argues that Computer-Assisted Language Learning (CALL) has the capacity to improve language learning through the use of captivating, interactive technologies. Yet, positively impactful adoption of CALL is determined exclusively by educators’ mindsets on these tools (Murray, 2014). Analytical scrutiny on these particular attitudes is of utmost significance for superior integration of CALL (Computer Assisted Language Learning) in technology fearful environments as the District Karak of Khyber Pakhtunkhwa /KP in Pakistan. Inadequate access to technological amenities, inadequate trainer coaching, and lack of assist in utilizing new educating methods are couple of academic challenges District Karak faces. The overall efficacy of such instruments in bettering language learning results can also be

compromised by way of these challenges, which might have an effect on teachers' willingness and ability to include CALL of their school rooms.

1.5 Research Objectives

1. To discover and describe the perceptions of English language instructors in District Karak toward the use of CALL equipment in their instructing practices.
2. To pick out and analyze the unique challenges encountered via English language instructors in District Karak when imposing CALL in major schools.

1.6 Research Questions

1. What are the perceptions of English language instructors in District Karak concerning the use of Computer-Assisted Language Learning (CALL) equipment in their classrooms?
2. What precise challenges do English language instructors in District Karak face when enforcing CALL in essential schools?

1.7 Significance of the Study

Significance of the Study The significance of this investigation is that it explores English language teachers' perceptions about Computer-Assisted Language Learning (CALL) in District Karak remotely. By understanding the attitude of teachers and challenges they are facing, targeted interventions and support can be designed. Findings will enable policy makers, educationalists and practitioners alike to develop strategies for better CALL integration with a view to improving language education outcomes in constrained contexts.

1.8 Limitation of study

Limitations The findings of the study may be restricted by its specific focus on District Karak and, therefore, it might not reflect the complete picture of CALL implementation in different regions. Furthermore, the perception and experience of CALL by teachers may be influenced to some extent by differences in availability of technology and expertise with which needs controlling for. Due to these

circumstances, the results might not apply as well to other areas that have different technological and educational conditions.

REVIEW OF RELATED LITERATURE

2.1 Historical Development of CALL

Computer-Assisted Language Learning (CALL) has undergone many years of development and reshaping it from a supplementary learning tool to being the main pedagogical model in language teaching. CALL has its roots in the 1960s, when design of early CALL applications involved navigating and using computers to aid the learning (often confined to linguistic tasks) through a series of specially designed exercises. The early CALL systems, for example PLATO (Programmed Logic for Automated Teaching Operations) and TICCIT were designed mostly in the United States and focused on repetitive drills of grammar and vocabulary tests (Beatty 2010). This period, frequently termed "behaviorist CALL", tended to be based in the behaviorist philosophy of learning with its emphasis on repetition, stimulus-response and reinforcement. The primary objective then was to give learners instant feedback and help the memorization of language forms with drill and practice software (Wu & Tsai, 2022).

2.2 Theoretical Foundations of CALL

The Socio-cultural Theory, proposed by Vygotsky (1978), strengthens the theoretical base of CALL as focus is given to the place of social context, mediation and collaboration in learning. It assumes that human cognitive development is the result of the use of cultural tools and social interaction in a learner's ZPD. In CALL, computers and digital tools are mediating artifacts that mediate the learning process, offering opportunities for collaboration, scaffolding and peer support. By means of collective online spaces and joint tasks, students negotiate meaning together and use language in realistic contexts. Hence CALL is very much in line with socio-cultural theory by providing learners with Situated, Collaborative and Emergent Contexts (Kumaravadivelu), where learning occurs in a social environment as opposed to a simply individual one (Tseng,

Cheng, & Yeh, 2019).

2.3 CALL Type

The evolution of CALL has been conceptualized by Warschauer (1996) and others as progressing through three major phases: behaviorist CALL, communicative CALL, and integrative CALL, each reflecting the dominant pedagogical theories and technological capabilities of its era. Behaviorist CALL (from the 1960s and 1970s onward) was based on behaviorist learning theory, which saw language learning as habit formation through repetition and reinforcement. Commonly used software during this time included drill-and-practice applications that emphasized individual elements of language, such as grammar and vocabulary. The computer served as a tutor, presenting drills and monitoring answers, often giving instantaneous feedback. Although it was very successful for rote learning, communicative skills and creativity development were somewhat overlooked by this method (Teo, Huang, & Hoi, 2018).

2.4 Teachers' Role in CALL

Teachers' are the key aspect of successful utilization of Computer-Assisted Language Learning (CALL). Technology supplies the devices and platforms for inventive language teaching, yet it is the teacher who determines how these tools become part of classroom activity. CALL is not studied in a vacuum and its success relies on the teachers' pedagogical choices, their attitude and competence (Hubbard, 2009). In technology-mediated language learning environment teachers are the facilitators, mediators and motivators. Not only are they required to choose CALL resources suitable for lessons, but also tasks that complement the learners' needs, interests, objectives as well as proficiency levels. Teachers need to mediate the divide between technological potential and pedagogical purpose, so that CALL activities are motivated by genuine communicative and educational objectives (Chapelle, 2001). Without the participation of the teacher, CALL may well only become a masturbatory adjunct to

the curriculum rather than a transformative pedagogical undertaking (Su Ping et al., 2019).

2.5 Teachers' Attitudes, Beliefs, and Readiness

Teachers' attitudes and perceptions toward technology are a key factor that dictates the level of CALL integration and its efficacy. While attitudes may serve to encourage and facilitate new practices, resistance or skepticism may block appropriation. As noted by Liaw (2002), teachers attitude towards perceiving the impact of CALL on their teaching and learning is a significant factor in determining whether they will choose to use it or not. These dispositions are influenced by past experiences, technological confidence, structural support, and by context rather than content. In areas with less exposure to technology, teachers are likely to see CALL as an extra burden rather than as an opportunity for improving pedagogical practice. By contrast, where teachers have regular PD and institution support CALL is more likely to be perceived as a positive supportive resource for improving language proficiency, learner motivation and involvement. Thus, the establishing of positive teacher attitudes by practising is regarded as crucial to long-term CALL integration (Shadiey, Liu, & Hwang, 2019).

2.6 Pedagogical Roles and Transformations in CALL Classrooms

CALL has changed the conventional teacher-oriented teaching to learner-centered instruction. In CALL-centered classroom settings, teachers are no longer the only language expert but a guide to encourage learners in exploring languages on their own and in collaboration with others. Warschauer & Healey, 1998) contend that CALL moves the teacher from being a "transmitter of knowledge" to becoming a "designer for learning", whereby learners interact with authentic materials of 'right now', live communication, and computer-based activities at their own pace. Task-based teaching is supported. A number of interactivity tools serve to support peer interaction and reflection, in order that learning is more active and personalized. Furthermore,

teachers need to weigh the technological and linguistic goals and make sure that digital devices support rather counteracts language learning. This pedagogical transformation necessitates a new set of skills for educators—not just the technical know-how but the savvy to critically assess digital resources and tailor them for different learning environments (Shadiev & Yang, 2020).

2.7 Teacher Training and Professional Development

Successful CALL adoption depends also on the level of digital skills and education of the teachers. The literature shows that insufficient knowledge on how to use CALL is always noted as one of the barriers that prevent language teachers from employing it (Blin & Munoz, 2010). Both technical and pedagogical training is needed to enable the teachers to have sufficient confidence in utilizing CALL tools in their teaching. Technical training teaches them how to use the software, solve technical problems, and apply multimedia features; pedagogical instruction includes ideas about integrating technology with learning goals and language acquisition principles. A confidence and motivation boost is also associated with these types of professional development programs, which are focused on practical experience, collaboration, and reflection (Murray 2014). For countries such as Pakistan which continue to struggle with resource constraints and lack of technology access, the case for long-term professional development is even stronger. Continuous support, mentoring and follow-up training for teachers prevent the CALL integration being an innovation of convenience rather than a pedagogical strategy (Small, 1973).

2.8 Challenges Faced by Teachers in CALL Integration

Although the potential of CALL has been acknowledged, teachers still face various difficulties when trying to put it into practice. Some factors are limited use of computer and internet, lack of institutional support, insufficient trainings and heavy teaching load (Khan et al., 2020). These types of problems are

also multiplied by deficiencies in infrastructure and overcrowded classrooms in most public sector schools, especially at the rural landscape such as District Karak. Teachers may also experience psychological obstacles, including technophobia, lack of confidence, and concern about losing control of ICT classrooms. Additionally, the lack of localized CALL resources that are fully integrated with national curricula continues to limit successful assimilation. As described by Egbert and Hanson-Smith (2007), despite the existence of technological devices, teachers' restricted exposure to the application of innovative teaching models may prevent technologies being used to their full pedagogical potential. These contextual and attitudinal barriers must therefore be tackled in order to achieve the fullest potential for CALL adoption in language learning (Shadiev & Wang, 2022).

RESEARCH METHODOLOGY

3.1 Research Design

The nature of this research is descriptive as this does not aim at changing variables but describes the current trends, attitudes and perceptions among teachers of English language in District Karak. The objective being to discern how teachers view CALL, what obstacles they find in their way and which circumstances determine their attitude toward technology. This descriptive mixed-methods research design is appropriate for educational research studies in which social and setting factors influence teaching (Creswell & Plano Clark, 2018).

3.2 Research Setting

The study is carried out in District Karak, a southern district of KPK Pakistan. The district is characterized as semi-urban rural lacking in technological and educational facilities. Karak's education sector is handicapped by underfunding, a lack of trained English teachers, outdated teaching materials and poor access to computers and the internet.

Primary schools in District Karak, especially ESED KP managed primary schools make an excellent site for the study. These

schools are still in the early stages of a technological implementation for educational purposes and teacher' perceptions are relevant to see how successful these initiatives will be (Henry et al., 2018). The linguistic diversity in the district, marked by daily use of Pashto and Urdu and other local languages, makes its English education system even more challenging. By examining this particular context, the study seeks to provide insights into the realities of CALL practice in a low-resource environment that may be extrapolated to a wider set of challenges faced by Pakistan's rural education system (Huang & Teo, 2020).

3.3 Population of the Study

The number of English teachers in the public-sector primary schools falls at around 120 and who work across three administrative tehsils Karak, Banda Daud Shah and Takht-e-Nasrati, according to the data collected by the District Education Office (2023). This population is the entire population from which a random sample is taken. The private-school teachers are not included in this study in order to still consider the public institution, where pedagogical infrastructure is quite limited and the penetration of CALL is even less.

3.4 Sample and Sampling Technique

From a large pool of 3200 English teachers in total a sample size of 30 numbers was extracted randomly using stratified random sampling. This method ensures coverage of all three Tehsils of the district, thereby potentially including differences in facilities in school, teacher experience and exposure to technology. Stratification is by type of school (boys' and girls' schools) and by geographic location (urban versus rural clusters), thus promoting variety and inclusiveness.

3.5 Research Instrumentation

The main research tool used was the interview guide or structured questionnaire to gather numerical and non-numerical information. Structure of the questionnaire the questionnaire is divided into 3 main sections: This section elicits background information of respondents, such as gender age, teaching

experience qualifications and of school (rural/urban) technology access. The questionnaire was prepared using the literature and modified to make it relevant with Pakistani educational system (Liaw, 2002; Kessler, 2018; Rehman & Saba, 2021). For face and content validity, the instrument was reviewed by two senior faculty members from the Department of English, KUST and for pilot testing five teachers not included in this study was used. Feedback received from this pilot was used to improve the wording and order of questions in an attempt to minimize error and increase understanding.

3.6 Data Collection Procedure

The process of data collection was organized in a structured manner in these successive stages to ensure coherence and ethical aspects. Formal approval was taken from the District Education Office (DEO) Karak and school heads before dissemination of their questionnaires. Subjects were briefed on the purpose of the study and assured that their responses would remain confidential and anonymous.

3.7 Data Analysis Techniques

Data was gathered following a stepwise structured data capture process to ensure uniformity and ethical adherence. Formal approval was taken from DEO Karak and school heads before disseminating the questionnaires. Participants were provided with the purpose of the study and guaranteed that participant's responses would remain confidential and anonymous. Questionnaires were personally administered to the teachers identified during pre-arranged school visits.

3.8 Validity and Reliability

For retaining the integrity of research results Validity and Reliability must be ensured. Validity the quality of an instrument in praying what is being measured. Content validity of the questionnaire was assessed by experts in applied linguistics and educational technology (Huang, Teo, & Guo, 2021). Relevance, clarity and consistency of items were assessed as regards the research goals.

DATA ANALYSIS

4.1 Demographic Information of Respondents

Table 4.1: Gender Distribution

Gender	Frequency	Percentage (%)
Male	18	60%
Female	12	40%
Total	30	100%

As displayed in table 4.1, 60% of the participants in the study were male and 40% were female. Therefore, it can be concluded that there is a higher concentration of male teachers over female teachers who teach English in primary schools located in District Karak. The male predominance in the workforce is the same with the case of Khyber Pakhtunkhwa where male

teachers remain the majority of the education workforce, particularly in the rural parts. However, the addition of female teachers brings balance and diversity to the study. This balance adds to the diversity of perspective to the study and brings about a more inclusive understanding of the perceptions of teachers towards using CALL, for male and female teachers.

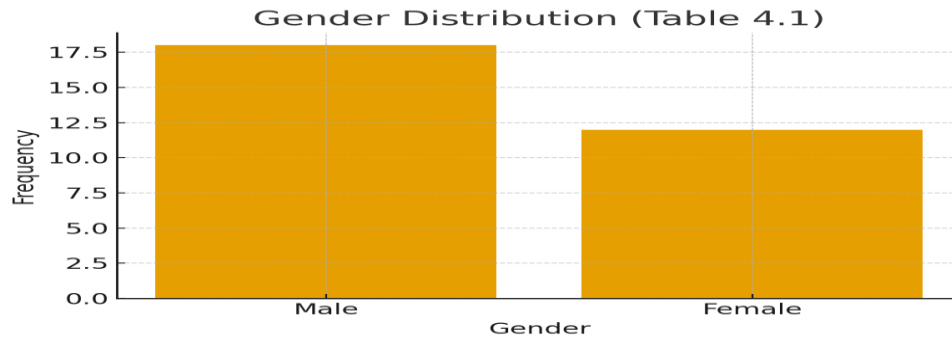


Figure 1

Table 4.2: Age of Respondents

Age Group	Frequency	Percentage (%)
20–30 years	8	26.7%
31–40 years	10	33.3%
41–50 years	7	23.3%
Above 50 years	5	16.7%
Total	30	100%

Respondents aged 31–40 years accounted for 33.3%, while those aged 20–30 years accounted for 26.7%. This suggests that most in the sample

were mid-career teachers who were mature and professionally stable, and were likely to have average exposure to technology. Also, the

smaller percentage of teachers over 50 years of age suggests that there are fewer senior educators, who might be less tech-savvy, in the district's primary schools. Therefore, the age profile indicates a workforce that could be

trained to adapt to technological changes.

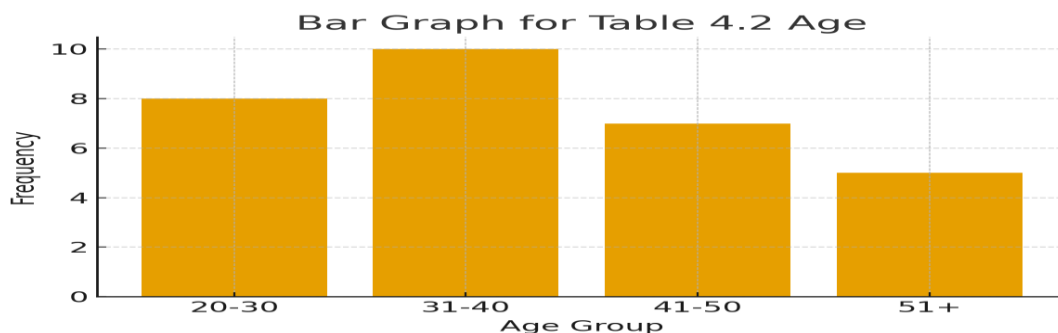


Figure 2

Table 4.3: Academic Qualification

Qualification	Frequency	Percentage (%)
B.A / B.Ed	10	33.3%
M.A / M.Ed	14	46.7%
M.Phil	4	13.3%
Other	2	6.7%
Total	30	100%

In looking at Table 4.3, it is possible to see that 46.7% of the teachers have M.A/M.Ed qualifications, while 33.3% have B.A/B.Ed qualifications. M.Phil. qualifies, comprising 13.3% of the cohort; reflect an apparent deficiency of higher degrees. Primary-level teachers, for the most part, have documentation featuring M.A/M.Ed degrees, as primary

teachers are more qualified than is often the case. As for the educational technology and/or linguistics-based CALL training, it is unfortunately more uncommon than expected. This educational blend helps to clarify not only the eagerness to use, but also the reluctance to employ technology in the instruction of English.

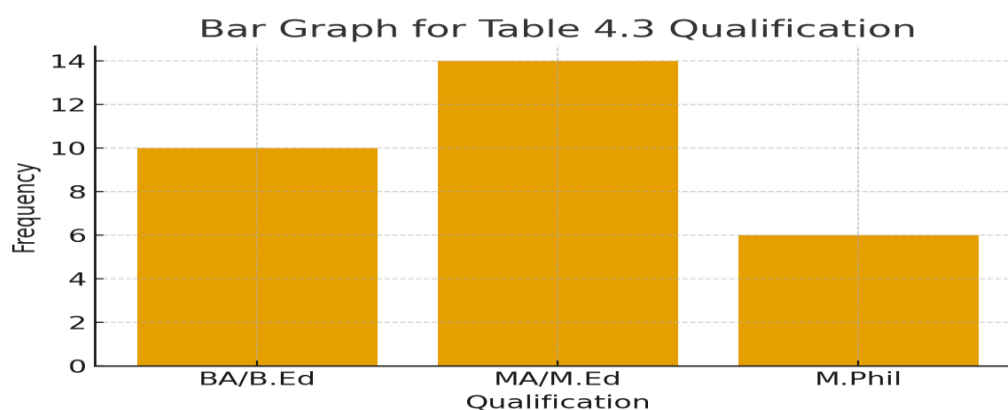


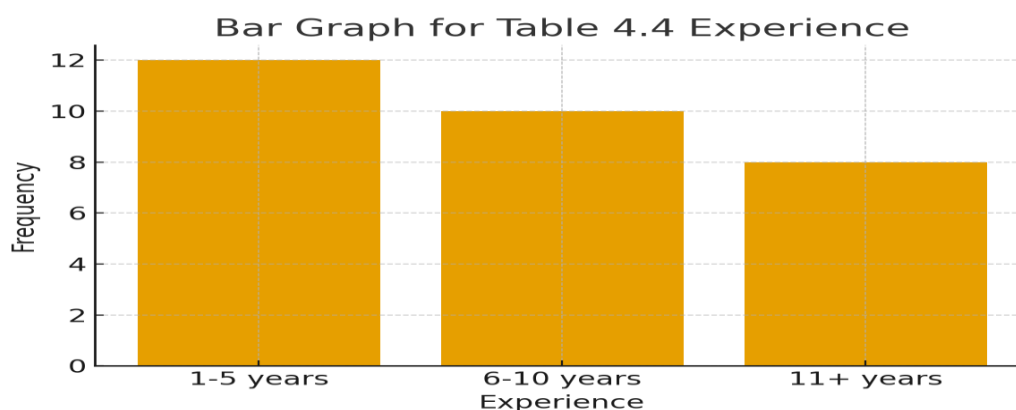
Figure 3

Table 4.4: Teaching Experience

Experience (Years)	Frequency	Percentage (%)
1–5 years	7	23.3%
6–10 years	10	33.3%
11–15 years	8	26.7%
Above 15 years	5	16.7%
Total	30	100%

The data presented in Table 4.4 indicates that the largest percentage (60%) of respondents is teachers who experience spanning six or more years. Following that is a significantly lower percentage (23.3%) that includes teachers that experience of 4 to 5 years. The data demonstrates that there is some sort of equilibrium in the experience of teachers whom respondents are surveyed to ideology to CALL. It can be inferred with the majority of respondent's profusion of years of experience that they would be capable of providing a

substantial review with regard to the teaching methodologies and methods that are implement within the classroom. Out of pedagogical perspective, the older and more experienced teachers sustain substantial amounts of knowledge with regard to teaching. However, the younger teachers, comparatively, would be more adaptable to new technologies and changes to the teaching. Overall, it can be argued that the sample surveyed had a very broad knowledge with regard to the use of CALL within the teaching methodologies.

**Figure 4****Table 4.5: School Type**

School Type	Frequency	Percentage (%)
Urban	9	30%
Rural	21	70%
Total	30	100%

Table 4.5 portrays that 70% of interviewees teach in rural schools and 30% teach in urban schools. This disparity shows that Karak District has rural schools only. Rural schools, by their nature, are resource deficient, have weak

infrastructure, and little access to CALL ICT facilities. This sample thus ensures that the findings represent the difficulties of implementing CALL.

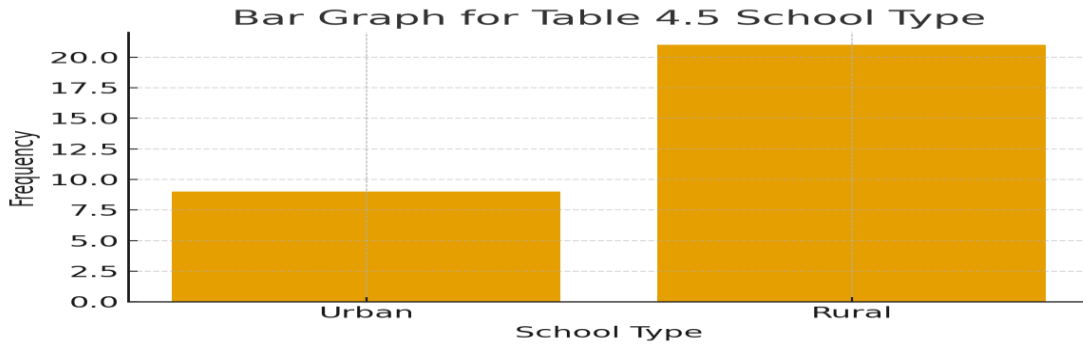


Figure 5

Table 4.6: Access to Technology

Access to Technology	Frequency	Percentage (%)
Yes	12	40%
No	18	60%
Total	30	100%

Table 4.6 shows that 40% of teachers have computers, multimedia equipment, and other technology, leaving 60% of educators with none of these resources. This detail exposes the infrastructural shortcomings among the district's primary schools. Lack of access to technology affects teachers' capacity to engage

with and implement certain CALL tools, resulting in the perception of CALL as a potentially useful tool, yet one that is too challenging to integrate into classroom practice.

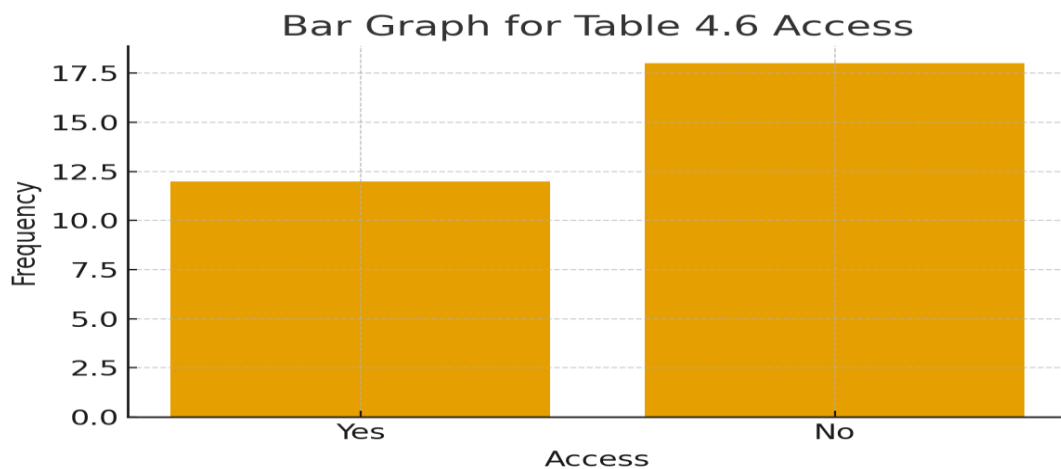


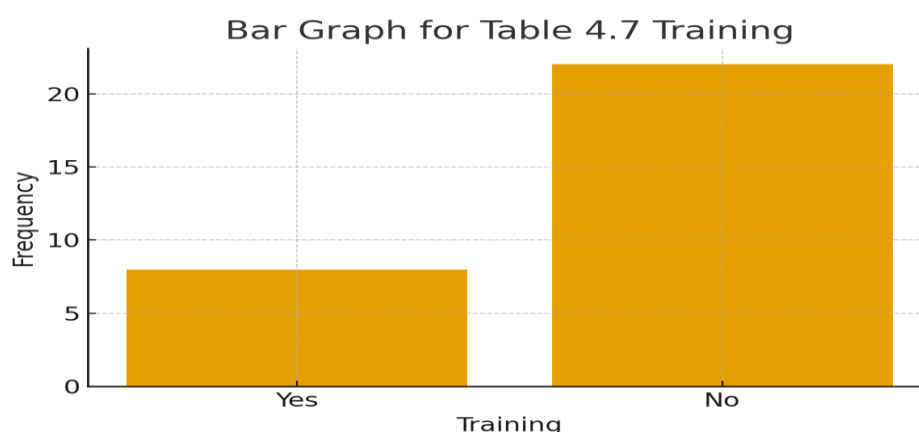
Figure 6

Table 4.7: CALL Training Experience

Received CALL/ICT Training	Frequency	Percentage (%)
Yes	8	26.7%
No	22	73.3%
Total	30	100%

Table (4.7) indicates that while a little over a quarter of teachers (26.7%) attended training sessions/workshops related to CALL/ICT skills, a large majority, (73.3%) of teachers indicated that they had not received any formal ICT training. This statistic signifies a major deficiency in the PD that teachers receive regarding the integration of technology in their teaching. This also suggests a possible

deficiency in teachers' confidence and/or competence to even use CALL. There is ample evidence that suggests/points to the fact that a lack of professional training is a major contributor/defining reason for teachers' lack of willingness to embrace technology in the classroom and lack of positive attitude toward the integration of technology in their teaching.

**Figure 7**

4.2 Analysis of Research Questions and Questionnaire Responses

Research Question 1:

Table 4.8: Perceived Usefulness of CALL

Statement	Mean (M)	SD
1. CALL helps me teach English more effectively.	4.10	0.77
2. CALL enhances students' motivation to learn English.	4.23	0.68
3. Computers make lessons more engaging.	4.17	0.72
4. CALL improves students' listening and speaking skills.	4.00	0.88
5. CALL supports individualized learning.	3.90	0.80

Statement	Mean (M)	SD
6. CALL helps assess students' progress accurately.	3.77	0.85
7. CALL builds students' digital literacy.	4.13	0.70
Overall Mean	4.04	0.77

Table 4.8 presents teachers' responses regarding the perceived usefulness of CALL. The overall mean score ($M = 4.04$) indicates strong agreement that CALL enhances teaching effectiveness, student motivation, and classroom engagement. Teachers particularly value CALL

for its ability to promote active participation and improve listening and speaking skills. The findings show a general awareness among teachers that CALL has pedagogical benefits. However, consistent access and support are essential to translate this awareness into regular practice.

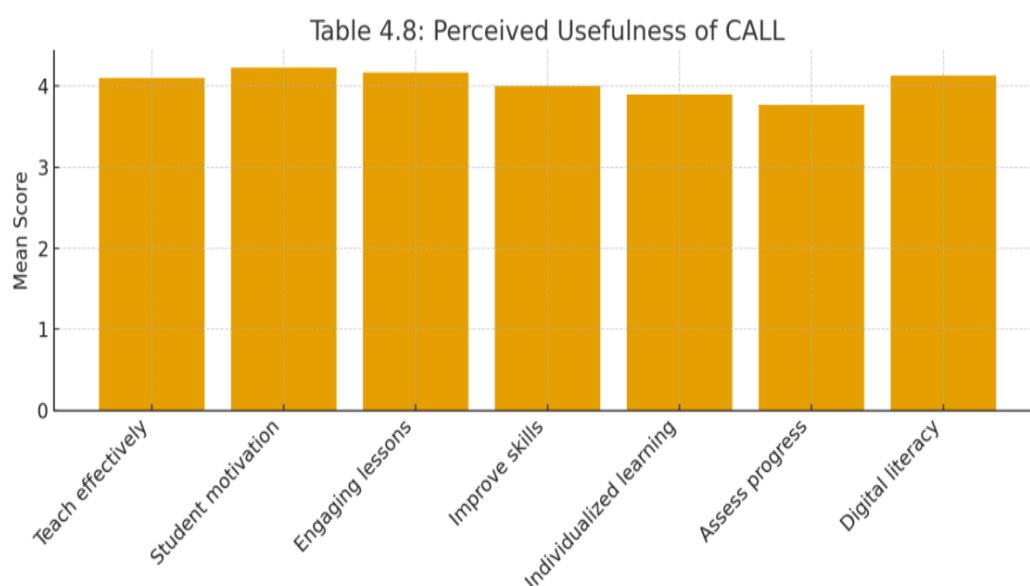


Figure 8

Research Question 2:

Table 4.9: Challenges in CALL Implementation

Statement	Mean (M)	SD
26. Lack of infrastructure limits CALL use.	4.47	0.64
27. Difficulty finding CALL materials matching curriculum.	4.10	0.79
28. CALL requires extra preparation time.	4.23	0.72
29. Students lack access to computers at home.	4.37	0.66
30. Resistance from management/colleagues.	3.73	0.90
Overall Mean	4.18	0.74

Table 4.9 conveys that educators overwhelmingly indicate that there are more infrastructural limitations ($M = 4.47$) and restricted access by students to technology ($M = 4.37$) challenges. The overall mean ($M = 4.18$) suggests that challenges have great magnitude on every one of the indicators. Teachers report that inadequate facilities, insufficient technical

aid, and misalignment of the curriculum all constrain the effective use of CALL. These results strongly indicate that although there are positive opinions, circumstantial barriers still prevent actual constructive use in the District of Karak.

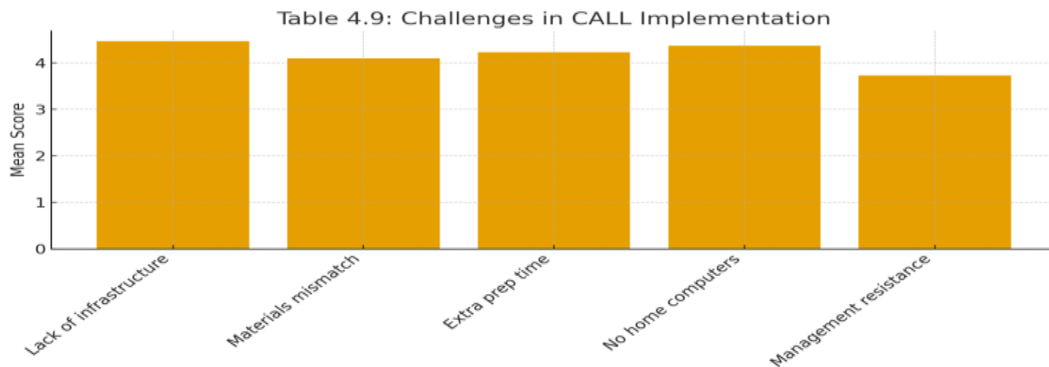


Figure 9

Table 4.10: Independent Samples t-Test Based on Gender

Research Dimension	Group	N	Mean (M)	SD	t-value	p-value	Interpretation
Perceived Usefulness of CALL	Male	18	4.08	0.73	0.43	0.67	Not Significant
	Female	12	3.98	0.80			
Perceived Ease of Use	Male	18	3.61	0.77	1.13	0.27	Not Significant
	Female	12	3.32	0.92			

Table 4.10 indicates that there is no significant difference in perception between male and females towards all CALL dimensions ($p > 0.05$). There was no significant difference between male and female teachers in terms of the perceived usefulness, ease and challenges of

CALL. This indicates that sex does not affect attitudes towards technology implementation. Thus, the CALL promotion policy should target both genders and consider underlying factors above gender.

Table 4.11: Independent Samples t-Test Based on School Location (Urban vs Rural)

Research Dimension	Group	N	Mean (M)	SD	t-value	p-value	Interpretation
Perceived Usefulness	Urban	9	4.36	0.60	2.14	0.04	Significant
	Rural	21	3.90	0.79			
Ease of Use	Urban	9	3.78	0.66	1.88	0.07	Not Significant
	Rural	21	3.34	0.88			

As illustrated in Table 4.11, significant

differences were found between urban and rural

teachers in perceived usefulness ($p = 0.04$) and institutional support ($p = 0.03$). Urban teachers rated CALL higher due to better infrastructure and resource availability, while rural teachers expressed lower satisfaction. No significant

difference was found in other dimensions. This indicates that location-based resource disparities shape how teachers experience and perceive CALL effectiveness.

Table 4.12: Independent Samples t-Test Based on CALL Training

Research Dimension	Group	N	Mean (M)	SD	t-value	p-value	Interpretation
Perceived Usefulness	Trained	8	4.32	0.61	2.05	0.049	Significant
	Untrained	22	3.93	0.78			
Ease of Use	Trained	8	3.89	0.66	2.27	0.031	Significant
	Untrained	22	3.32	0.87			

.Table 4.12 shows significant differences between trained and untrained teachers in perceived usefulness ($p = 0.049$), ease of use ($p = 0.031$), and teacher confidence ($p = 0.048$). Trained teachers reported greater comfort, enthusiasm, and competence in applying CALL

tools. No significant differences were found in institutional support or perceived challenges. This confirms that training directly enhances teachers' perceptions and capabilities in technology integration.

Table 4.13: One-Way ANOVA for Gender-Based Differences in Teachers' Perceptions toward CALL (N = 30)

Research Dimension	Source Variation	Sum of Squares (SS)	df	Mean Square (MS)	F-value	p-value
Perceived Usefulness of CALL	Between Groups (Gender)	0.112	1	0.112	0.41	0.527
	Within Groups	7.624	28	0.272		
	Total	7.736	29			
Perceived Ease of Use	Between Groups	0.308	1	0.308	1.17	0.289

Table 4.13 presents ANOVA results comparing male and female teachers' perceptions across all CALL dimensions. All p-values exceeded 0.05, indicating no significant gender-based differences. Both male and female teachers share similar levels of agreement regarding

CALL's usefulness, ease of use, and relevance. The results confirm that gender does not statistically affect CALL perception, suggesting a uniform attitude toward technology integration across both groups.

Table 4.14: Summary of ANOVA Results (Gender-Wise)

Research Question / CALL Dimension	F-value	p-value	Significance Level	Result
RQ1: Perceived Usefulness	0.41	0.527	$p > 0.05$	Not Significant
RQ2: Perceived Challenges	0.18	0.674	$p > 0.05$	Not Significant

Table 4.14 consolidates the ANOVA results, reaffirming that none of the five research dimensions show significant gender differences ($p > 0.05$). This implies that teachers' perceptions toward CALL are shaped more by structural and professional variables—like training and infrastructure—than by gender.

Consequently, policymakers and educational planners should focus on improving technological access and training opportunities for all teachers equally.

Table 4.15: Summary of Themes, Sub-Themes, and Sample Responses

Main Theme	Sub-Themes
Theme 1: Positive Perceptions Toward CALL	• CALL improves English learning • Enhances student motivation • Increases engagement
Theme 2: Challenges in CALL Implementation	• Lack of infrastructure • Unreliable electricity/internet • Shortage of devices

Theme 1: Positive Perceptions toward CALL

Theme 1 (Large): The first thematic pattern is that teachers in District Karak interpret CALL as very useful for pedagogy. Respondents always mentioned that CALL enhances motivation of the students, promotes comprehension and is interactive in nature. Teachers noted that digital audio, animated videos and online pronunciation tools make abstract concepts easier to understand, particularly in grammar and phonics. This is also consistent with the quantitative results ($M = 4.04$) which indicate that teachers are aware of CALL as an effective form of modern teaching to improve English proficiency. As few are exposed to it still, the enthusiasm for CALL suggests a possible readiness upon an improved set of circumstances.

Theme 2: Challenges in CALL Implementation

One key topic to emerge across interviews was the crippling demand on infrastructure, coupled with scarce computer access and power-outs; weak internet signal and overfull classrooms. Reliability of electricity and availability of simple technology was cited

by teachers to be the cause of frustration in using CALL. These results are consistent with the quantitative outcomes that participants reported the high level of perceived challenges ($M = 4.18$). Teachers also acknowledged that there were resources but they are not enough or old. Consequently CALL continues to be closer to an ideal model than a lived reality. This is the theme that exposes a huge digital gap between rural and urban schools in District Karak.

DISCUSSION, FINDINGS AND CONCLUSION

5.2 Findings

The findings reveal that the teaching force in District Karak's primary schools is male-dominated, with 60% male and 40% female participants. This imbalance reflects the general demographic pattern in public schools across Khyber Pakhtunkhwa, where social and cultural factors often limit female participation, particularly in rural areas. However, both genders are represented in sufficient proportion to reflect diverse experiences. The gender mix ensures that the perceptions collected represent both male and female perspectives on CALL adoption and its potential in English language

teaching (Kacetl & Klímová, 2019).

According to the data, most of English teachers belong to this section (61%) including 33.3% aged 31–40 and then those who are in their 20s groups account for approximately a quarter (26.7%). This result relates to two possibilities: most teachers are consolidation professionals, who have teaching experience and are able of changing; or there is a great inflow issue making newly qualified teachers nervous. Their age breakdown means they are a cohort that understands old-fashioned teaching methods, but old enough to be receptive to change — and reform when it comes in a digitally-friendly package. As a result, attitudes towards CALL are determined by previous experience and openness to teaching innovation (Karataş & Tuncer, 2020).

The majority of the respondents (46.7%) were M.A/M.Ed., followed by 33.3% with B.A/B.Ed and only 13.3% were M.Phil. This reflects that the teaching staff is well educated but not very academically or ICT qualified. It suggests that, while these teachers may be well- prepared in pedagogy, they are not specialized in educational technology and linguistics. This distance has an impact on their ability to develop CALL-mediated lessons and instruction independently of support or training.

Results of the t-test indicate that the differences between males and females on all CALL dimensions are not significant ($p > 0.05$). This might indicate that male and female teachers have a common perception of, and attitude towards, CALL. In this context, gender relative to teachers' attitudinal beliefs or confidence in the use of educational technology is not set. The findings also confirm that the local context and institutional environment play a much greater role than gender in influencing CALL attitudes.

One major difference between rural and urban teachers is revealed in the analysis -- perceived usefulness ($p = 0.04$) and school support ($p = 0.03$). Urban teachers, asking who tend to have more facilities and opportunity available, feel that CALL is more helpful and supported by the schools. Conversely, local

teachers face more issues regarding infrastructural gaps. This underscores the prevailing digital divide between urban and rural educational settings in District Karak.

Results indicate that trained and untrained teachers differed significantly in perceived usefulness ($p = 0.049$) ease of use ($p = 0.031$), and teacher confidence ($p = 0.048$). Compared to untrained teachers, trained teachers report higher confidence, value CALL more, and perceive it as being easier to use. This implies that training is an essential factor in attitude building and upgrading the teachers' technical skills, thereby, justifies the continuous need for professional development workshops.

The summary table for results of t-test is given in The summary table summarizes the finding of t-test and demonstrates that school location and CALL training have statistically significant influence on teachers' perception, but gender does not. Urban teachers and those who have received any training are more positive about and confident to use CALL. These findings underscore the need for equity in context and ongoing professional development to close the perception gaps and encourage balanced CALL utilization across all schools.

The results of the ANOVA test indicate that the p-values for each of the five CALL dimensions is greater than 0.05, indicating that gender has no meaningful impact on teachers' perceptions. The male and female teachers have similar attitudes to the usefulness, ease and effectiveness of CALL. Consistency in this trend may imply that gender equality is optimal regarding acceptance of technology by the teachers, and the determining factors are infrastructure, resource, and training but not sex.

The lack of significant differences in research question response by gender is also supported by Table 4.18. It finds that teachers' attitudes toward CALL tend to be relatively homogeneous based on gender, pointing out that external influences such as training and availability of resources appear to exert more influence. This result reinforces the inference that male and female teachers are equally willing to accept technology in English language

education in the institution whether these conditions are favorable.

5.3 Discussion

5.3.1 Perceived Usefulness of CALL (Research Question 1)

Respondents from District Karak indicated considerable appreciation for the value of CALL systems, a calculated mean of 4.04 corroborates this. Perceptions of effectiveness centered on the contribution to the achievement of overall classroom goals targeted, the promotion of active participation of learners, the enhancement of learner motivation, and improvements in classroom interactivity. This is a widespread educators' viewpoint as documented in various studies (Warschauer & Healey, 1998; Hubbard, 2009) that demonstrated the positive impact of technology use in the classroom in promoting/ facilitating active engagement and learner autonomy. Teachers' appreciation of the potential impact of CALL is positive constructivist appreciations of the need for students to construct attend learning in the classroom.

Realization of the potential positive impact of CALL is unfortunately very low and this is not as a result of negative attitudes toward the systems. This observation resonates with Murray, 2014 where he posits that educators in low-resource setups foster a positive attitude toward the use of technology, but fail to implement it. In District Karak, a positive perception of the use of technology in education for language improvement is present, but there are significant systemic issues that limit the use of technology in language education (Klímová, 2017).

5.3.5 Perceived Challenges in CALL Implementation (RQ 2)

The information shows that teachers face some critical challenges (total M = 4.18). Principal problems include: insecure infrastructure, deficient curricular digital content and scarce student access to technology beyond the walls of the institution. These are the same problems describe for-example by Kim (2014) and Rehman and Saba (2021) in limited

resource neutral environments (Li et al., 2021).

The issues that teachers suffer from are more ingrained: a lack of electricity, insufficient funding and no guidance from administrators. These obstacles consequently influence all but the most optimistic teachers' motivation to use CALL. It seems that in rural Pakistan, the diffusion of CALL depends more on teachers' attitude than the microscopic policy level shifts towards infrastructure and equitable digital access (Lee, 2019c).

5.3.6 Demographic and Contextual Findings (t-Tests and ANOVA)

a. Gender-Wise Findings

Results of both t-test and ANOVA analyses suggested that no ($p > 0.05$) gender factor distinctions regarding all CALL factors. This is welcome news as it suggests that both male and female teachers are equally prepared to adopt technology. It also indicates that gender is not a determining factor in CALL adoption, but professionalism and the environment are. This is consistent with the research performed by Liaw (2002) who argued gender distinctions disappeared given equivalent access and exposure (Lee, 2019b).

b. Urban–Rural Differences

Urban teachers showed stronger perceived utility and support in the institution than rural teachers ($p < 0.05$). These variations are explained by easier infrastructure access, higher administration facilitation and more exposure to ICT tools in urban schools. The finding is consistent with Kessler (2018) who previously indicated that regional level digital inequality has a direct impact on CALL usage. For District Karak, this underscores the dire need for investment in rural infrastructure to close the digital divide (Lim & Aryadoust, 2021).

c. Training-Based Differences

Significant differences were detected between trained and untrained teachers based on the perceived usefulness ($p = 0.049$), ease of use ($p = 0.031$) and confidence ($p = 0.048$). Trained teachers had higher self-efficacy, better

technical skill ability, and a more positive attitude than untrained teachers. This is in line with Hubbard (2009) and Murray (2014), who maintained that through effective CALL practitioner training, one can develop a favorable behavioral intention to use technology. Teacher education programs, therefore, need to incorporate hands-on computer-assisted language-learning modules in order to improve digital pedagogical competences (Lin & Hwang, 2018).

5.3.7 Synthesis of Overall Findings

In summary, the conversation reflects that teachers in District Karak have a robust belief in the pedagogical potential of CALL and the high degree of readiness to integrate technology in their instruction. Yet, their practice of such beliefs is limited by structural conditions—lack of infrastructure, inadequate professional training, and absence of institutional backing. These restrictions validate that the incorporation of technology is an organism phenomenon, not simply an idiosyncratic one. The results of the study are compatible with Constructivist and Socio-cultural theories, which argue that learning (and teaching) occurs in a process of relating between individuals and their surroundings (Liu, Sands-Meyer, & Audran, 2018). Teacher perceptions in the District Karak are therefore subject to the institutional and cultural contexts that they operate in. Optimistic attitudes are indicative of receptiveness to change, and challenges cited reflect the necessary structural transformation needed to make that change possible (Marshall, Shannon, & Love, 2020).

5.4 Conclusion of the Study

The current study aimed to investigate the attitudes of English language teachers towards CALL at primary schools in District Karak-KP. Using mixed methods that entailed an abstract analysis and qualitative inspection, the study aimed to uncover teachers' perceptions toward CALL regarding its perceived usefulness, ease of use, institutional support and facing obstacles in a resource limited educational setting. The results show that teachers in Tehsil Karak have very positive

responses towards the implementation of technology in English language instruction. They consider CALL as an efficient and motivating device to facilitate students' learning. But these utopian visions stand in stark contrast to daunting structural, institutional and technical barriers to practical implementation (Mei, Brown, & Teo, 2018).

In addition, the findings also show that the site of school and allocation of resources are important factors to influence teacher experiences with CALL. Urban teachers with better facilities and awareness had more positive perceptions than rural teachers. However, the differences among gender were not statistically significant, indicating that male and female teachers have a similar degree of technology acceptance. This demonstrates that the relevant variables in CALL adoption are situational and structural rather than demographic. Conclusion The findings of this study thus highlight the necessity for providing equally accessible technological infrastructure in all schools, especially rural ones such as those in District Karak, to facilitate universal advancement in language education (Mumford & Dikilitaş, 2020).

On the theoretical level, the study confirms the tenets of Constructivism, Interactionism and Socio-cultural Theory that have enriched with importance socially: mediated interaction; cooperative principles and socio-contextual aspects of learners' development. Teachers' attitudes are influenced by their surroundings - access to tools, support from the institution and cultural beliefs about technology. Therefore CALL integration cannot be achieved by individual endeavor but it can only be realized if it is supported at a system level, such as by the educational authorities, school principals or government policies (Namaziandost & Çakmak, 2020).

To sum up, the potential of CALL to bring about EFL transformation in this part of Pakistan is enormous but achieving this potential requires a multifaceted strategy. Policy makers need to focus on teacher training, investing in infrastructure and aligning curriculum with support for technology. The

needs outlined are what should be the focus of CALL so that it can develop from an underutilized innovation to an operational and self-supporting aspect of English language teaching. The present study lays the basis of teachers' perspectives in District Karak and offers important lessons for planning future interventions that envisage introducing technology based learning within primary schools across Pakistan (Ngoc & Barrot, 2023).

5.5 Recommendations

As a result of the findings and implications drawn from this study, some key recommendations that could assist to enhance the implementation of CALL at primary level in district Karak and other areas within Pakistan can be proposed. This study's findings reveal that, although teachers hold generally positive views towards CALL, their uptake is throttled by a lack of infrastructure, inadequate preparation and weak institutional commitment. Measures to address these gaps need to be developed collaboratively and sustainably at various levels of the education system; thus, we propose guidelines for addressing these concerns.

Above all, teacher education and educator training programs need to be at the top of the list. The result of the study indicated that trained teachers were confident, competent and willing to use CALL tools. Therefore, education authority's special Khyber Pakhtunkhwa Province elementary and secondary education department should arrange comprehensive in-service training programmers with emphasis on technical and pedagogical aspects of CALL. They should not simply focus on rudimentary computer skills, (i.e., how to type a letter,) but rather demonstrate to practicing classroom teachers the ways in which they can use technology to support communicative, interactive and learner-centered English lessons. In addition, mentorship, refresher trainings and peer-peer learning groups need to be established to sustain skill-building rather than one off interventions.

Second, there is an urgent need to enhance technological infrastructure and accessibility in schools, particularly in rural

districts like the District Karak. Unreliable power, few computers and no internet connection were cited by many as specific problems. The government, in partnership with local education departments and private providers should invest in solar-powered devices, affordable laptops/tablets as well as offline CALL resources which may work in a context of low-connectivity. Equipping primary schools with functional computer labs which would be maintained by well paid technical staff will help the teacher in the use of CALL. The development of infrastructure also means the installation of digital projectors, interactive whiteboards and educational software covering the local curriculum.

Third, support by the institution and leadership is necessary for CALL integration to be sustainable. Pri-maries and sec-ondary school instruc-tors are ini-ti-ated for try-ing out tech-nol-ogy by school heads and admin. Hence, principals and head of the educational bodies need orientation about pedagogical aspect of CALL in order to promote an institutional way. This involves providing time for the teachers to develop CALL activities, embedding evaluation of technology innovation in appraisals and promoting shared working practice among teachers to share not only resources but also best practices. Institutional belonging as an incentive increases teacher's self-confidence and innovation.

Fourth, the research suggests that curriculum linkage and content development at a local level is key. Most of the teachers complained that it was hard for them to find CALL material which fits in Pakistan's primary level English syllabus. The Curriculum Wing, Ministry of Federal Education and Professional Training, hence should work in collaboration with linguists, technologists, and teachers to prepare context-based CALL materials that are reflective of local cultural realities and linguistic requirements as well as learning goals. Local universities, especially the English and Education Departments can chip in by developing OER (open access digital content) in English as well as Urdu which conforms to the national curricula and is freely available to

teachers across districts.

Fifth, at the policy level, interventions would be needed to establish CALL as a mainstream activity in Pakistani public education. Results suggest that both the practice and potentiality of CALL are intermittent, spur-of-the-moment affairs rather than planned ones. There should be ad provincial government ICT-in-Education Policy Framework for language learning which would make equitable provision of resources between urban and rural schools. Sources of funding should be clear and technology infusion should be a measurable target in school improvement plans. Collaboration with donor agencies and educational technology NGOs (like UNESCO and British Council projects, for example) could bolster implementation and monitoring.

Finally, teachers, institutions and technology developers should collaborate and network. A local CALL service center could be created at Kohat University of Science and Technology (KUST) to act as a teacher training centre, software testing ground and content depot. One such center could collaborate with district education offices to offer ongoing technical assistance (help desk support), and organize yearly CALL symposiums at which teachers share successes and innovation. Such a cooperative environment would not just enrich the motivation, but also guarantee the sustainability of CALL implementation.

References

- Abdullah, M. Y., Hussin, S., & Ismail, K. (2019). Implementation of flipped classroom model and its effectiveness on English speaking performance. *International Journal of Emerging Technologies in Learning (iJET)*, 14(9), 130. <https://doi.org/10.3991/ijet.v14i09.10348>
- Abraham, S., Mir, B. A., Suhara, H., Mohamed, F. A., & Sato, M. (2019). Structural equation modelling and confirmatory factor analysis of social media use and education. *International Journal of Educational Technology in Higher Education*, 16(1). <https://doi.org/10.1186/s41239-019-0157-y>
- Alfalalah, S. F. M. (2018). Perceptions toward adopting virtual reality as a teaching aid in information technology. *Education and Information Technologies*, 23(6), 2633–2653. <https://doi.org/10.1007/s10639-018-9734-2>
- Amiryousefi, M. (2017). The incorporation of flipped learning into conventional classes to enhance EFL learners' L2 speaking, L2 listening, and engagement. *Innovation in Language Learning and Teaching*, 13(2), 147–161. <https://doi.org/10.1080/17501229.2017.1394307>
- Andujar, A., Salaberri-Ramiro, M. S., & Martínez, M. S. C. (2020). Integrating flipped foreign language learning through mobile devices: Technology acceptance and flipped learning experience. *Sustainability*, 12(3), 1110. <https://doi.org/10.3390/su12031110>
- Aria, M., & Cuccurullo, C. (2017). bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics*, 11(4), 959–975. <https://doi.org/10.1016/j.joi.2017.08.007>
- Aryadoust, V. (2020). A review of comprehension subskills: A Scientometrics perspective. *System*, 88, 102180. <https://doi.org/10.1016/j.system.2019.102180>
-), 528–551. <https://doi.org/10.1080/09588221.2019.1627459>
- Bailey, D., Almusharraf, N., & Hatcher, R. (2021). Finding satisfaction: Intrinsic motivation for synchronous and asynchronous communication in the online language learning context. *Education and Information Technologies*, 26(3), 2563–2583.

- <https://doi.org/10.1007/s10639-020-10369-z>
- Batista-Canino, R. M., Santana-Hernández, L., & Medina-Brito, P. (2023). A scientometric analysis on entrepreneurial intention literature: Delving deeper into local citation. *Heliyon*, 9(2), E13046. <https://doi.org/10.1016/j.heliyon.2023.e13046>
- Behl, A., Jayawardena, N., Pereira, V., Islam, N., del Giudice, M., & Choudrie, J. (2022). Gamification and e-learning for young learners: A systematic literature review, bibliometric analysis, and future research agenda. *Technological Forecasting and Social Change*, 176, 121445. <https://doi.org/10.1016/j.techfore.2021.121445>
- Chen, M. R. A., & Hwang, G. J. (2019). Effects of a concept mapping-based flipped learning approach on EFL students' English speaking performance, critical thinking awareness and speaking anxiety. *British Journal of Educational Technology*, 51(3), 817–834. <https://doi.org/10.1111/bjet.12887>
- Chen, M.-P., Wang, L.-C., Zou, D., Lin, S.-Y., Xie, H., & Tsai, C.-C. (2020). Effects of captions and English proficiency on learning effectiveness, motivation and attitude in augmented-reality-enhanced theme-based contextualized EFL learning. *Computer Assisted Language Learning*, 35(3), 381–411. <https://doi.org/10.1080/09588221.2019.1704787>
- Chen, M.-R. A., Hwang, G.-J., Majumdar, R., Toyokawa, Y., & Ogata, H. (2021). Research trends in the use of E-books in English as a foreign language (EFL) education from 2011 to 2020: A bibliometric and content analysis. *Interactive Learning Environments*, 31(4), 2411–2427. <https://doi.org/10.1080/10494820.2021.1888755>
- Chen, T., Peng, L., Yang, J., & Cong, G. (2021). Analysis of user needs on downloading behavior of English vocabulary apps based on data mining for online comments. *Mathematics*, 9(12), 1341. <https://doi.org/10.3390/math9121341>
- Chen, X. L., Zou, D., Xie, H. R., & Su, F. (2021). Twenty-five years of computer-assisted language learning: A topic modeling analysis. *Language Learning & Technology*, 25(3), 151–185. <http://hdl.handle.net/10125/73454>
- Chen, Y.-H., & Keng, C.-J. (2019). Utilizing the Push-Pull-Mooring-Habit framework to explore users' intention to switch from offline to online real-person English learning platform. *Internet Research*, 29(1), 167–193. <https://doi.org/10.1108/IntR-09-2017-0343>
- Chen, Y.-L., & Hsu, C.-C. (2020). Self-regulated mobile game-based English learning in a virtual reality environment. *Computers & Education*, 154, 103910. <https://doi.org/10.1016/j.compedu.2020.103910>
- Chen, Z., Chen, W., Jia, J., & An, H. (2020). The effects of using mobile devices on language learning: A meta-analysis. *Educational Technology Research and Development*, 68(4), 1769–1789. <https://doi.org/10.1007/s11423-020-09801-5>
- Cheng, Y.-W., Wang, Y., Yang, Y.-F., Yang, Z.-K., & Chen, N.-S. (2020). Designing an authoring system of robots and IoT-based toys for EFL teaching and learning. *Computer Assisted Language Learning*, 34(1–2), 6–34. <https://doi.org/10.1080/09588221.2020.1799823>
- Cheung, A. (2023). Language Teaching during a Pandemic: A Case Study of Zoom Use by a Secondary ESL Teacher in Hong Kong. *RELC Journal*, 54(1), 55–70. <https://doi.org/10.1177/0033688220981784>

- Chiu, M.-S. (2020). Exploring models for increasing the effects of school information and communication technology use on learning outcomes through outside-school use and socioeconomic status mediation: The Ecological techno-process. *Educational Technology Research and Development*, 68(1), 413–436. <https://doi.org/10.1007/s11423-019-09707-x>
- Chung, C.-J., Hwang, G.-J., & Lai, C.-L. (2019). A review of experimental mobile learning research in 2010–2016 based on the activity theory framework. *Computers & Education*, 129, 1–13. <https://doi.org/10.1016/j.compedu.2018.10.010>
- Clermont, M., Krolak, J., & Tunger, D. (2021). Does the citation period have any effect on the informative value of selected citation indicators in research evaluations? *Scientometrics*, 126(2), 1019–1047. <https://doi.org/10.1007/s11192-020-03782-1>
- Cobo, M. J., López-Herrera, A. G., Herrera-Viedma, E., & Herrera, F. (2011). An approach for detecting, quantifying, and visualizing the evolution of a research field: A practical application to the fuzzy sets theory field. *Journal of Informetrics*, 5(1), 146–166. <https://doi.org/10.1016/j.joi.2010.10.002>
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340. <https://doi.org/10.2307/249008>
- Dede, C. (2000). Emerging influences of information technology on school curriculum. *Journal of Curriculum Studies*, 32(2), 281–303. <https://doi.org/10.1080/002202700182763>
- Elaish, M. M., Liyana, S., Ghani, N. A., & Yadegaridehkordi, E. (2019). Mobile English language learning (MELL): A literature review. *Educational Review*, 71(2), 257–276. <https://doi.org/10.1080/00131911.2017.1382445>
- Gao, L. X., & Zhang, L. J. (2020). Teacher learning in difficult times: Examining foreign language teachers' cognitions about online teaching to tide over COVID-19. *Frontiers in Psychology*, 11, 549653. <https://doi.org/10.3389/fpsyg.2020.549653>
- Gillespie, J. (2020). CALL research: Where are we now? *ReCALL*, 32(2), 127–144. <https://doi.org/10.1017/S095834402000051>
- Goksu, I., Ozkaya, E., & Gunduz, A. (2022). The content analysis and bibliometric mapping of CALL journal. *Computer Assisted Language Learning*, 35(8), 2018–2048. <https://doi.org/10.1080/09588221.2020.1857409>
- Hockly, N., & Dudeney, G. (2018). Current and future digital trends in ELT. *RELC Journal*, 49(2), 164–178. <https://doi.org/10.1177/0033688218777318>
- Huang, F., & Teo, T. (2020). Influence of teacher-perceived organisational culture and school policy on Chinese teachers' intention to use technology: An extension of technology acceptance model. *Educational Technology Research and Development*, 68(3), 1547–1567. <https://doi.org/10.1007/s11423-019-09722-y>
- Huang, F., Teo, T., & Guo, J. (2021). Understanding English teachers' non-volitional use of online teaching: A Chinese study. *System*, 101, 102574. <https://doi.org/10.1016/j.system.2021.102574>
- Huang, F., Teo, T., & Zhou, M. (2019). Factors

- affecting Chinese English as a foreign language teachers' technology acceptance: A qualitative study. *Journal of Educational Computing Research*, 57(1), 83–105. <https://doi.org/10.1177/0735633117746168>
- Hubbard, P. (2013). CALL and the future of language teacher education. *CALICO Journal*, 25(2), 175–188. <https://www.jstor.org/stable/calicojournal.25.2.175> <https://doi.org/10.1558/cj.v25i2.175-188>
- Jiang, D., & Zhang, L. J. (2020). Collaborating with 'familiar' strangers in mobile-assisted environments: The effect of socializing activities on learning EFL writing. *Computers & Education*, 150, 103841. <https://doi.org/10.1016/j.compedu.2020.103841>
- Jiang, L., & Ren, W. (2020). Digital multimodal composing in L2 learning: Ideologies and impact. *Journal of Language, Identity & Education*, 20(3), 167–182. <https://doi.org/10.1080/15348458.2020.1753192>
- Johnson, G. M. (2010). Internet use and child development: Validation of the ecological techno-subsystem. *Educational Technology & Society*, 13(1), 176–185. <http://hdl.handle.net/20.500.11937/12215>
- Johnson, G. M., & Pupilampu, P. (2008). A conceptual framework for understanding
- Klímová, B. (2017). Mobile phones and/or smartphones and their apps for teaching English as a foreign language. *Education and Information Technologies*, 23(3), 1091–1099. <https://doi.org/10.1007/s10639-017-9655-5>
- Klímová, B., & Seraj, P. M. I. (2023). The use of chatbots in university EFL settings: Research trends and pedagogical implications. *Frontiers in Psychology*, 14, 1131506. <https://doi.org/10.3389/fpsyg.2023.1131506>
- Lamb, M., & Arisandy, F. E. (2019). The impact of online use of English on motivation to learn. *Computer Assisted Language Learning*, 33(1–2), 85–108. <https://doi.org/10.1080/09588221.2018.1545670>
- Lee, G., & Wallace, A. (2018). Flipped learning in the English as a foreign language classroom: Outcomes and perceptions. *TESOL Quarterly*, 52(1), 62–84. <https://doi.org/10.1002/tesq.372>
- Lee, J. S., & Lee, K. (2020). The role of informal digital learning of English and L2 motivational self system in foreign language enjoyment. *British Journal of Educational Technology*, 52(1), 358–373. <https://doi.org/10.1111/bjet.12955>
- Lee, S.-M. (2019). The impact of using machine translation on EFL students' writing. *Computer Assisted Language Learning*, 33(3), 157–175. <https://doi.org/10.1080/09588221.2018.1553186>
- Lim, M. H., & Aryadoust, V. (2021). A scientometric review of research trends in computer-assisted language learning (1977 – 2020). *Computer Assisted Language Learning*, 35(9), 2675–2700. <https://doi.org/10.1080/09588221.2021.1892768>
- Lin, C.-J., & Hwang, G.-J. (2018). A learning analytics approach to investigating factors affecting EFL students' oral performance in a flipped classroom. *Educational Technology & Society*, 21(2), 205–219. <https://www.jstor.org/stable/26388398>
- Marshall, D. T., Shannon, D. M., & Love, S. M. (2020). How teachers experienced the COVID-19 transition to remote instruction. *Phi Delta Kappan*, 102(3), 46–50.

- <https://doi.org/10.1177/0031721720970702>
- Mei, B., Brown, G. T. L., & Teo, T. (2018). Toward an Understanding of Preservice English as a Foreign Language Teachers' Acceptance of Computer-Assisted Language Learning 2.0 in the People's Republic of China. *Journal of Educational Computing Research*, 56(1), 74–104. <https://doi.org/10.1177/0735633117700144>
- Moorhouse, B. L., Li, Y., & Walsh, S. (2021). E-classroom interactional competencies: Mediating and assisting language learning during synchronous online lessons. *RELC Journal*, 54(1), 114–128. <https://doi.org/10.1177/0033688220985274>
- Mumford, S., & Dikilitaş, K. (2020). Pre-service language teachers reflection development through online interaction in a hybrid learning course. *Computers & Education*, 144, 103706. <https://doi.org/10.1016/j.compedu.2019.103706>
- Namaziandest, E., & Çakmak, F. (2020). An account of EFL learners' self-efficacy and gender in the flipped classroom model. *Education and Information Technologies*, 25(5), 4041–4055. <https://doi.org/10.1007/s10639-020-10167-7>
- Navarro, J. L., & Tudge, J. R. H. (2023). Technologizing Bronfenbrenner: Neo-ecological theory. *Current Psychology (New Brunswick, NJ)*, 42(22), 1–17. <https://doi.org/10.1007/s12144-022-02738-3>
- Ngoc, B. M., & Barrot, J. S. (2023). Current landscape of English language teaching research in Southeast Asia: A bibliometric analysis. *The Asia-Pacific Education Researcher*, 32(4), 517–529. <https://doi.org/10.1007/s40299-022-00673-2>
- Nie, J., Zheng, C., Zeng, P., Zhou, B., Lei, L., & Wang, P. (2020). Using the theory of planned behavior and the role of social image to understand mobile English learning check-in behavior. *Computers & Education*, 156, 103942. <https://doi.org/10.1016/j.compedu.2020.103942>
- Oraif, I., & Elyas, T. (2021). The impact of COVID-19 on learning: Investigating EFL learners' engagement in online courses in Saudi Arabia. *Education Sciences*, 11(3), 99. <https://doi.org/10.3390/educsci11030099>
- Palacios Hidalgo, F. J. (2020). TELL, CALL, and MALL: Approaches to bridge the language gap. In C. Huertas-Abril & M. Gómez-Parra (Eds.), *International approaches to bridging the language gap* (pp. 118–134). IGI Global. <https://doi.org/10.4018/978-1-7998-1219-7.ch008>
- Pawlak, M., Derakhshan, A., Mehdizadeh, M., & Kruk, M. (2021). Boredom in online English language classes: Mediating variables and coping strategies. *Language Teaching Research*, 136216882110649. <https://doi.org/10.1177/13621688211064944>
- Poláková & Klímová. (2019). Mobile technology and Generation Z in the English language classroom- A preliminary study. *Education Sciences*, 9(3), 203. <https://doi.org/10.3390/educsci9030203>
- Pritchard, A. (1969). Statistical bibliography or bibliometrics. *Journal of Documentation*, 25, 348–349.
- Sepulveda-Escobar, P., & Morrison, A. (2020). Online teaching placement during the COVID-19 pandemic in Chile: Challenges and opportunities. *European Journal of Teacher Education*, 43(4), 587–607. <https://doi.org/10.1080/02619768.2020.103942>

- Shadiev, R., & Wang, X. (2022). A review of research on technology-supported language learning and 21st century skills. *Frontiers in Psychology*, 13, 897689. <https://doi.org/10.3389/fpsyg.2022.897689>
- Shadiev, R., & Yang, M. (2020). Review of studies on technology-enhanced language learning and teaching. *Sustainability*, 12(2), 524. <https://doi.org/10.3390/su12020524>
- Shadiev, R., Liu, T., & Hwang, W. Y. (2019). Review of research on mobile-assisted language learning in familiar, authentic environments. *British Journal of Educational Technology*, 51(3), 709–720. <https://doi.org/10.1111/bjet.12839>
- Small, H. (1973). Co-citation in the scientific literature: A new measure of the relationship between two documents. *Journal of the American Society for Information Science*, 24(4), 265–269. <https://doi.org/10.1002/asi.4630240406>
- Su Ping, R. L., Verezub, E., Adi Badiozaman, I. F. b., & Chen, W. S. (2019). Tracing EFL students' flipped classroom journey in a writing class: Lessons from Malaysia. *Innovations in Education and Teaching International*, 57(3), 305–316. <https://doi.org/10.1080/14703297.2019.1574597>
- Turan, Z., & Akdag-Cimen, B. (2020). Flipped classroom in English language teaching: A systematic review. *Computer Assisted Language Learning*, 33(5-6), 590–606. <https://doi.org/10.1080/09588221.2019.1584117>
- van Eck, N. J., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics*, 84(2), 523–538. <https://doi.org/10.1007/s11192-009-0146-3>
- van Eck, N. J., & Waltman, L. (2014). Visualizing bibliometric networks. In Y. Ding, R. Rousseau, & D. Wolfram (Eds.), *Measuring scholarly impact* (pp. 285–320). Springer. https://doi.org/10.1007/978-3-319-10377-8_13
- Wang, N., Chen, J., Tai, M., & Zhang, J. (2019). Blended learning for Chinese university EFL learners: Learning environment and learner perceptions. *Computer Assisted Language Learning*, 34(3), 297–323. <https://doi.org/10.1080/09588221.2019.1607881>
- Wu, X. (2022). Motivation in second language acquisition: A bibliometric analysis between 2000 and 2021. *Frontiers in Psychology*, 13, 1032316. <https://doi.org/10.3389/fpsyg.2022.1032316>
- Xu, Z., Chen, Z., Eutsler, L., Geng, Z., & Kogut, A. (2020). A scoping review of digital game-based technology on English language learning. *Educational Technology Research and Development*, 68(3), 877–904. <https://doi.org/10.1007/s11423-019-09702-2>
- Yang, J. C., & Quadir, B. (2018). Effects of prior knowledge on learning performance and anxiety in an English learning online role-playing game. *Journal of Educational Technology & Society*, 21(3), 174–185. <https://www.jstor.org/stable/26458516>
- Yang, J.-C., Lin, M. Y. D., & Chen, S. Y. (2018). Effects of anxiety levels on learning performance and gaming performance in digital game-based learning. *Journal of Computer Assisted Learning*, 34(3), 324–334. <https://doi.org/10.1111/jcal.12245>
- Yang, Q.-F., Chang, S.-C., Hwang, G.-J., & Zou, D. (2020). Balancing cognitive complexity and gaming level: Effects of a cognitive complexity-based

- competition game on EFL students' English vocabulary learning performance, anxiety and behaviors. *Computers & Education*, 148, 103808. <https://doi.org/10.1016/j.compedu.2020.103808>
- Yeh, H.-C. (2018). Exploring the perceived benefits of the process of multimodal video making in developing multiliteracies. *Language Learning & Technology*, 22(2), 28–37. <http://hdl.handle.net/10125/44642>
- Yilmaz, R. M., Topu, F. B., & Takkaç Tular, A. (2022). An examination of the studies on foreign language teaching in pre-school education: A bibliometric mapping analysis. *Computer Assisted Language Learning*, 35(3), 270–293. <https://doi.org/10.1080/09588221.2019.1681465>
- Zhang, R., & Zou, D. (2022b). Types, purposes, and effectiveness of state-of-the-art technologies for second and foreign language learning. *Computer Assisted Language Learning*, 35(4), 696–742. <https://doi.org/10.1080/09588221.2020.1744666>
- Zhang, X. (2019). A bibliometric analysis of second language acquisition between 1997 and 2018. *Studies in Second Language Acquisition*, 42(1), 199–222. <https://doi.org/10.1017/S0272263119000573>
- Zhonggen, Y., Ying, Z., Zhichun, Y., & Wentao, C. (2018). Student satisfaction, learning outcomes, and cognitive loads with a mobile learning platform. *Computer Assisted Language Learning*, 32(4), 323–341. <https://doi.org/10.1080/09588221.2018.1517093>
- Zou, D. (2020). Gamified flipped EFL classroom for primary education: Student and teacher perceptions. *Journal of Computers in Education*, 7(2), 213–228. <https://doi.org/10.1007/s40692-020-00153-w>
- Zou, D., & Haoran, X. (2018). Personalized word-learning based on technique feature analysis and learning analytics. *Educational Technology & Society*, 21(2), 233–244. <https://www.jstor.org/stable/26388402>
- Zou, D., & Xie, H. (2018). Flipping an English writing class with technology-enhanced just-in-time teaching and peer instruction. *Interactive Learning Environments*, 27(8), 1127–1142. <https://doi.org/10.1080/10494820.2018.1495654>
- Zupic, I., & Čater, T. (2015). Bibliometric methods in management and organization. *Organizational Research Methods*, 18(3), 429–472. <https://doi.org/10.1177/1094428114562629>