



# Effect of CALL-based multimodal pedagogy on learner motivation and willingness to communicate in English: A study from university students' perspective

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## ABSTRACT

With technological advancement, multimodality has received paramount importance in teaching and learning. Different technology-based assistance is available nowadays, and computer-assisted language learning (CALL) is one of them. It uses computer-based tools, materials, resources, and information to assist second language learning. Motivation keeps learners focused and persistent, making them more willing to communicate in a second language. This quantitative study unearths how the use of multimodal pedagogical resources motivates language learners and promotes their willingness to communicate (WTC). For this purpose, data is collected from the English language learners of three semesters from the department of English, University of Sahiwal. From the 3<sup>rd</sup>, 5<sup>th</sup>, and 7<sup>th</sup> semesters, the data is collected using Google Forms, and a five-point Likert scale questionnaire is utilized as the research instrument. The responses are analyzed descriptively using SPSS 29. The validity and reliability analysis of the questionnaire is also done to check the quality and strength of the instrument utilized. Inferential Statistical Analysis is done by using two non-parametric tests, the Mann-Whitney U Test and Kruskal-Wallis H test. From the responses received and the descriptive analysis, it is observed that the use of multimodal pedagogies motivates the learners and makes them more willing to communicate in the target language not only inside the classroom but also outside the classroom.

**Keywords:** CALL, motivation, WTC, multimodal pedagogy, multimodality

## INTRODUCTION

With technological advancement in the modern world, computers, mobile phones, tablets, and other digital tools have increased. Technology significantly and positively affects learning a foreign language (Kazu & Kuvvetli, 2023; Lange & Costley, 2020). Technology has been greatly integrated into EFL classrooms to promote and support language learning through various tasks and activities. In traditional classrooms, only isolated and printed text were provided as language learning materials (Sari, 2020), but with the passage of

time and the advent of multimedia technology various types of materials are provided that help language learning for EFL learners. Multimedia represents the text in different modes in appealing ways according to learners' preferences and learning styles (de Souza et al., 2021). After the COVID-19 pandemic, the involvement of technology has greatly increased, and the learning mode has shifted toward e-learning. After the pandemic, these multiple modes are also used in the classrooms specifically for English language learners, which provides great help. In Pakistani schools and classrooms, previously, only books and printed text materials provided by the government were the sole source of learning the language. However, the appropriate use of this multimodal technology in EFL classrooms can be very beneficial for foreign language learners.

Using different classroom tools and techniques helps to develop English language learners' proficiency (Ahmad et al., 2024). Computer-assisted language learning (CALL) is considered one of the most significantly used techniques that assists language teaching and learning. CALL stands for "computer-assisted language learning". In English language teaching (ELT), CALL is used to provide materials from the internet, computer websites, online sources, and other social media services to enhance interaction among users (Tomlinson, 2012). Multiple approaches are used to incorporate CALL in teaching, but the major goal is using digital tools, i.e., smartboards, iPads, multimedia and multimodal resources, interactive whiteboards, and textbooks (Billore & Rosén, 2016). CALL in the classrooms creates a supportive and language-learning environment that involves the actual practice of the language being used to develop language proficiency and fluency (Billore & Rosén, 2016). One of the basic purposes of language learning is to develop proficiency and make learners communicate in the target language. The teaching and learning using the CALL motivates the learners to understand, use, and communicate effectively in a second or foreign language. Motivation is one of the most important variables that affect second language learning. According to Gardner and Lambert (1972), "*motivation is the eagerness when an individual learns a new language and the satisfaction experienced in that activity.*" Gardner and Lambert (1972) emphasize the four elements that are the basic pillars of motivation: a goal, desire to achieve a goal, positive attitudes and efforts (Lai, 2013). The more motivated an individual is, the more energetic he is toward achieving his goals.

The basic purpose of learning a foreign language is to communicate effectively in that language; without effective communication, there is no use in learning a language (Younas et al., 2019). Various factors motivate the learners to communicate. According to MacIntyre (2007), "*willingness to communicate (WTC) is an individual's voluntary involvement in a communicative event in the target language.*" An individual will only participate in a communicative event if he is competent and fluent in the language. WTC comes with fluency in the target language. MacIntyre et al. (1998) emphasize that the ultimate goal of a learning process is to make learners willing to participate in a conversation. Multiple factors affect an individual's WTC, such as external or internal factors (Asad et al., 2024; Aziz & Shakir, 2023; Imran & Almusharraf, 2024; Yashima, 2002). Some of the factors that affect one's WTC are one's knowledge about the communicative event, personality type, knowledge of L2, self-confidence, response to errors, the audience and type of interaction, fluency and proficiency, anxiety and motivation, plays a significant role (Hewitt & Stephenson, 2012). CALL-mediated pedagogical resources and activities enhance learners' WTC and lower anxiety levels, leading to effective language learning. The study aims to explore the effect of CALL-based multimodal pedagogical resources on learner motivation and WTC.

## Research Objectives

The following are the objectives of this study:

1. To observe the role of CALL-based multi-modalities in enhancing the motivational levels of learners.
2. To find the diverse CALL-based modalities to assist learners' WTC.

## Research Questions

The current study answers the subsequent research questions:

1. How do CALL-based multi-modalities enhance learners' motivation?
2. How do CALL-based diverse modalities assist learners' WTC?

## Significance of Research

The significance of this research lies in the importance of CALL and multimodality, as the traditional and monotonous modes of teaching make learning less effective. The learners get bored by the bookish readings and writings taught in traditional classrooms. Hence, using multiple modes teachers use to make learning easy and interesting plays a significant role. Computers make using various modes easier; in the classroom, CALL is well-ingrained these days. Various technologies nowadays help promote effective language learning; some of them mentioned by Golonka et al. (2014) are schoolhouse or classroom-based course management technologies, interactive whiteboards, e-portfolios, electronic dictionaries, corpus-based tools, grammar and POS checkers, intelligent tutoring, automatic speech recognition and pronunciations, online websites such as Wikipedia, Virtual Assistants, Chatbots, etc. In Pakistan, English is learned as a foreign language; hence, achieving native-like fluency and competence is difficult. To speak a foreign language fluently, the learners need to be highly motivated and willing to communicate, as this is the aim of the study. Using multimodal pedagogical resources motivates the learners to use these resources and communicate well in the target language. The research is conducted to look forward to the students' feedback and reviews on the importance and role of CALL-based multimodal pedagogical resources teachers use to motivate learners and make them more willing to communicate.

## LITERATURE REVIEW

### Multimodality

Multimodality uses multiple modes to learn, teach, engage, or present something; it makes information available through various channels (Guichon & Cohen, 2016). Kress and van Leeuwen (2000) are considered the pioneers of multimodality, and their theories are based on Halliday's (1978) systematic functional linguistics (SFL) and social semiotics. It implies the usage of various semiotic modes to create meanings of any semiotic object or event, it also helps in effective communication by mixing several modes. It emphasizes the coexistence of different linguistic and visual, verbal, oral, or aural resources to support constructing and communicating meaning in a particular context Jewitt (2013). For English language learners, multimodal pedagogical resources play a significant role in understanding a foreign language because the written or linguistic resources are insufficient for language competence and performance. Multimodal pedagogy helps learners understand and use foreign language in daily life and social or classroom settings.

### Multimodal Pedagogy

Multimodal pedagogy is a teaching approach that uses various communication modes such as verbal, visual, oral, aural, spatial, and gestural. It connects different pieces of information to convey a particular meaning (Tran, 2024). This is a powerful teaching tool to present and teach in English language classroom settings to facilitate learning (Aziz et al., 2021). A multimodal material consists of more than one or two modes to express meaning. With technological advancement, it is easy to present multimodal material through Computer, particularly for language learners known as CALL. According to Halliday's (1978) SFL, language is a social semiotic resource, which shows that meaning is created through the context of some social interaction.

### *Multimodal pedagogy and motivation*

For learning English as a foreign language, multimodal pedagogical resources hold great importance as they help develop competence, which leads to good performance of learners in language. Studies show that different students have different learning styles, and only by using multimodal resources all kinds of students can be handled carefully (Fedorenko & Kravchenko, 2023; Kazu & Kuvvetli, 2023). According to Grenner and Hagelin Jönsson (2019), motivation is one's eagerness to learn a new language; when multimodal resources are available in the classroom or outside the educational setting, it becomes easy to understand, learn, and communicate in the target language. The theory of Digital Humanities supports digitizing the educational system and environment, increasing digital and technological socialization, and leading them to mastery of language (Maqbool et al., 2024).

## **Multimodal pedagogy and willingness to communicate**

MacIntyre (2007) defines WTC as an individual's voluntary involvement in a communicative event. In language learning, WTC is particularly related to communication in the target language. As foreign learners, most foreign speakers cannot achieve native-like fluency and performance as they feel reluctant to speak the language in specific settings or among specific people. It is proposed in the previous studies that when pedagogical information is presented multimodally, the learners are more interested in classroom learning as teaching through providing visual images and audio-visual videos (Jaramillo & Nadolny, 2023), storytelling, gesturing, and acting physically. The key to communicating willingly in the target language is self-confidence and frequency of communication (Fedorenko, 2018). Self-confidence helps overcome the pre-disposed apprehensions and anxiety that motivate the learners; it also depends on how frequently the learners use the target language in different settings. WTC is considered the main aim of learning a target language and it can be achieved by multimodal pedagogical resource materials, more interaction, and practice to help learners achieve an expected level of fluency (Peng & Woodrow, 2010).

### **Review of Previous Studies**

Gutierrez et al. (2024) study CALL and its nuances in foreign language learning and observe how the teachers support using CALL, which improves learners' resilience, WTC, and academic well-being. This study is conducted through pre-test and post-test methods from various dimensions. It reveals that the learners who have a great support of teachers to use CALL in classroom environment are highly resilient and more Willing to communicate either in the classroom or outside the classroom setting. The study also highlights the importance of the role of teachers in causing a positive impact on learners' experiences in CALL. Huang and Li (2024) present a review study on the impact of enhanced language learning technology through computers or other digital tools. It shows how these environments enhance the learners' WTC in L2 learning. The study shows the different factors discussed by different researchers to improve learning; some factors relate to cognitive, situational, linguistic, and affective factors. The interactive factors also play a significant role in language learning. It sums up that along with the challenges and issues of technology, it has multiple benefits; different pedagogical goals and objectives are archived easily when CALL is used.

Adara and Haqiyah (2021) study the role of CALL in improving learner motivation in EFL classroom settings in Indonesia. They argue that technology plays a significant role in improving learner motivation, and in order to prove this, they conduct quasi-experimental research, including questionnaires and interviews with 40 students. This study concludes that CALL needs to be implemented in the classroom for effective foreign language learning. At the end of the study, the researchers suggest that this kind of research needs to be conducted on a diverse population, and the use of CALL and its effectiveness largely depends on the type of learners, such as to which group they belong, are they computer friendly and their personality types too. Perez (2020) investigates the significance of multimodal Inputs in second language learning from different viewpoints. It focuses not only on linguistic outcomes, such as vocabulary learning, grammar understanding, pronunciation, and comprehension but also on processing the provided multimodal input. One of the many sources is the videos available on TV, which are taken as input for language learning as vocabulary demands reading and listening at the same time for reading.

Grenner and Hagelin Jönsson (2019) examine the effect of CALL on learner motivation and how it helps in language development in the context of the English language. It is a review-based study considering 14 articles under the same framework using the motivational theory proposed by Dörnyei and Ushioda (2021). The major purpose of the study is to investigate, in an EFL classroom, how CALL assists language learning and motivates the learners, such as how it develops communication skills. It also investigates the views of both the teachers and pupils regarding this by taking feedback. It concludes that, in educational contexts, the best planning of material is needed; the teachers must plan their teaching material to the best of how, when, why, and what to use, and the use of CALL is embraced positively by both the learners and teachers. Guichon and Cohen (2016) explain that multimodality is the key feature of CALL as they explore the issues related to multimodality. In the study, they integrate computer-based challenging tasks such as teaching through a videoconferencing system. Different kinds of semiotic resources are used for multimodal learning of material. Technology plays a significant role in language competence development.

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## RESEARCH METHODOLOGY

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The methodology of this study is quantitative, following the questionnaire survey through Google Forms, and data was analyzed through SPSS. Firstly, the descriptive analysis is done from the responses received through the questionnaire. The items in the questionnaire were related to the perspectives of ELT learners on the effect of using multimodal pedagogical resources in motivating the learners and making them more willing to communicate in the target language. The questionnaire was adapted from Peng and Woodrow (2010) and with some additions and alterations by the researchers. These are described according to the five-point Likert scale, and the items' means, medians, modes, and standard deviations are also included. The validity of the questionnaire is checked through factor analysis by describing the principal components, which are graphically represented on the screen plot. Similarly, the reliability analysis of the questionnaire is done by finding the alpha coefficient. For the inferential statistical analysis, two non-parametric tests are applied to the questionnaire: the Mann-Whitney U test and Kruskal-Wallis H test, the former for two independent samples and the latter for three independent samples.

### Population and Sample

This pilot study was conducted at the University of Sahiwal, Pakistan. Two hundred English department students were selected by random sampling method who were doing their graduation in English language and Literature. The selected sample was the students of three semesters, i.e., 3<sup>rd</sup>, 5<sup>th</sup>, and 7<sup>th</sup>. The study aimed to investigate students' views on using the approach of multimodal pedagogical resources and its effect on their motivation and WTC.

### Research Instrument

The five-point Likert scale questionnaire was distributed through Google Forms, and the learners were to choose one of the five options given in each question: strongly disagree, disagree, neutral, agree, and strongly agree. The questionnaire was divided into five total sections, out of which three sections contain the question items, and the other two include the description of the research and the participants' demographic information. The first section gave a brief description of the research and introduced the topic and major terms; the second section was related to the use and importance of multimodal pedagogies; the second included the motivation in the target language, and the third section contained the items related to WTC, each section contains ten question items and the last section contains the demographic information, the participants' names, gender, semester and their willingness to participate in the second phase of the study (interview). The responses were collected, 200 total responses, and the results were calculated and interpreted according to the theoretical reviews. We theoretically shows a relationship among CALL-based pedagogical resources, motivation, and WTC in the target language.

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## FINDINGS AND DISCUSSION

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### Validity Analysis of the Questionnaire

For the validity analysis of the questionnaire pilot testing and factor analysis are done. **Table 1** describes the total variance factor analysis.

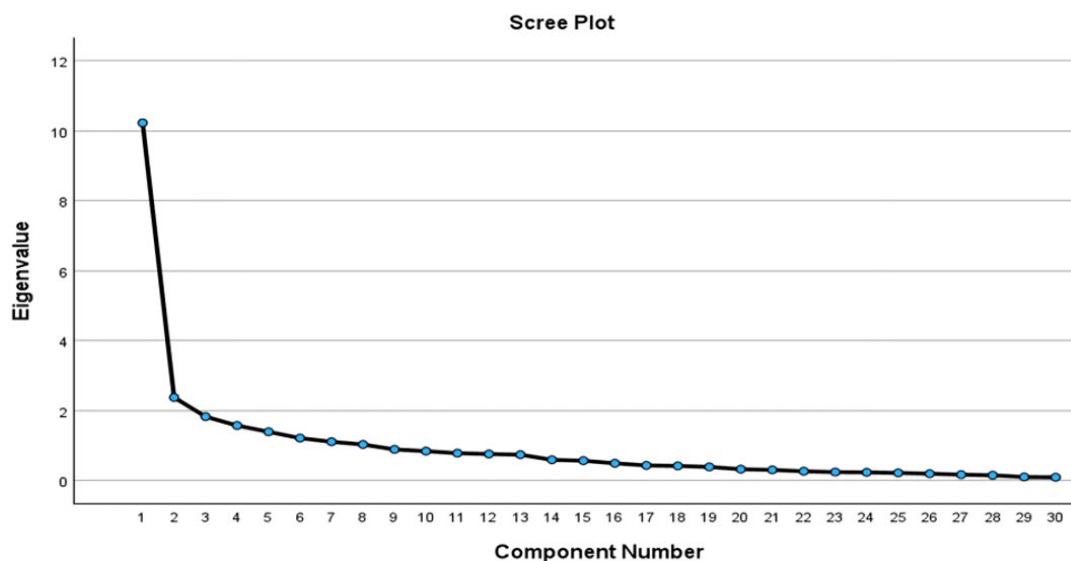
Utilize factor analysis to extract valuable factors without losing much data. Scree plot is a tool for analysis because the extracted number of factors is graphically represented through the scree plot, which is also known as a scree test (Shrestha, 2021). It is a line graph that presents the eigenvalues of factors or principal components that are extracted. These factors are shown in descending order on the horizontal axis in the form of a curve that flattens as the eigenvalues fall off (**Figure 1**).

The retained factors are identified from the curve of the scree plot. It is easy to identify the number of factors from the elbow of the plot where it bends or straightens and the eigenvalues drop. These values are counted in descending order. From the above-given scree plot, it is observed that eight principal components or factors are extracted because the elbow of the curve shows a drop in eigenvalues after that.

**Table 1.** Total variance explained (factor analysis)

Component	Initial Eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	10.231	34.104	34.104	10.231	34.104	34.104
2	2.378	7.928	42.031	2.378	7.928	42.031
3	1.829	6.096	48.127	1.829	6.096	48.127
4	1.575	5.249	53.377	1.575	5.249	53.377
5	1.396	4.653	58.029	1.396	4.653	58.029
6	1.215	4.050	62.079	1.215	4.050	62.079
7	1.111	3.702	65.782	1.111	3.702	65.782
8	1.032	3.441	69.222	1.032	3.441	69.222

Note. Extraction method: Principal component analysis



**Figure 1.** Scree plot of principal components or factors (the authors’ own work)

**Table 2.** Reliability statistics

Cronbach’s alpha	Number of items
.888	30

### Reliability Analysis of the Questionnaire

For any study, the acceptable level of alpha coefficient is greater than 0.60. According to Hinton et al. (2004), the excellent reliability score is 0.90 or above, and the lowest reliability score is 0.50 or below. The Cronbach’s alpha or alpha coefficient is measured to check an instrument’s internal consistency. **Table 2** shows the value of the alpha coefficient for the research instrument that has been utilized; for the current study, the value of Cronbach’s alpha is 0.888, which means that the instrument has high internal consistency and is, hence, a reliable instrument for the concerned study.

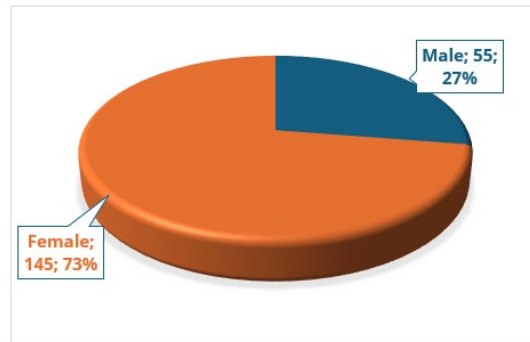
### Analysis of the Questionnaire

The questionnaire responses were collected through Google Forms, and the data were analyzed using SPSS (version 29) to present and discuss the results descriptively.

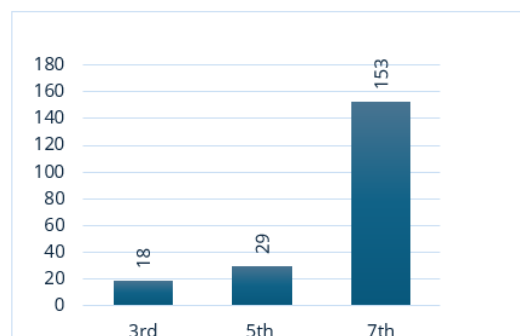
### Demographic information

This study is based on the population from the public sector university in central Punjab, Pakistan. Due to limited resources and time, the researchers have limited this pilot study to only one institution and will later expand this study model to other institutions, especially after receiving financial support to carry out this project at an extended level. Before starting this study, informed consent was received from all volunteer candidates and ensured that this involvement would be only for educational purposes and that no personal data or information would be published or shared at any stage.





**Figure 2.** Gender of the respondents (the authors' own work)



**Figure 3.** Semester of the respondents (the authors' own work)

**Figure 2** and **Figure 3** show the gender of the respondents who willingly responded to the questionnaire and the semester of the respondents in which they are enrolled. Out of 200 respondents, 145 (73%) are females, and only 55 (27%) are males. **Figure 2** clearly shows that the ratio of female respondents is far more significant than that of male participants, which means the female EFL learners favor using multimodal pedagogies to motivate the learners, making them more willing to communicate. Three semesters were selected to collect the responses; **Figure 3** shows the number of respondents who responded to the questionnaire. Out of 200 respondents, 153 (77%) respondents belong to the 7<sup>th</sup> semester, 29 (14%) were enrolled in the 5<sup>th</sup> semester, and only 18 (9%) respondents were from the 3<sup>rd</sup> semester, which makes the least of the percentages. This ratio of the participants shows the students' belief in the senior semester how important multimodal teaching resource materials are for language learning and effective communication.

### **Descriptive statistical analysis**

**Table 3** contains ten question items on using CALL-based multimodal pedagogical resources. The responses are noted according to the 5-point Likert scale, which has options as SD (strongly disagree), D (disagree), N (neutral), A (agree), and SA (strongly agree). **Table 1** contains the 5 question items from this section; in response to item number 1 of the questionnaire, 46.5% of respondents agree, and 43.0% strongly agree that they like learning English through multimodal pedagogies. However, some of the participants disapprove of this statement; 7.5% of respondents strongly disagree, and 2.0% of participants disagree, which means they do not like learning when different types of resources are used. The mean of item 1 is 4.16, its median and mode are 4.00 and 4, respectively, while its standard deviation is 1.085. Item number 2 of the questionnaire also relates to the use of multimodal pedagogies as a helping tool for learning English on which a significantly high positive response is observed: 56.5% of respondents strongly agree, and 37.5% agree that it is a helping tool, only a few respondents about 3.0% disagree to the statement that means they do not find these resources helpful, while some respondents about 3.0% also have neutral views on this item.

The mean of item 2 is 4.48, the median and mode are 5.00 and 5, respectively, while the standard deviation is 0.701. Item 3 asks whether using these multimodal resources makes English language learners uncomfortable, to which a high percentage, about 47.5%, disagree and 19.5% strongly disagree. Among respondents, 13.0% have neutral views on this statement, while 16.5% agree and 3.5% strongly agree that it

**Table 3.** Question items on using CALL-based multimodal pedagogical resources

No	Items	Scale (%)					M	MD	MO	STD
		SD	D	N	A	SA				
1	I like learning when different types of resources are used in English classes.	7.5	2.0	1.0	46.5	43.0	4.16	4.00	4	1.085
2	Using different modes or resources (e.g. digital whiteboard, PowerPoint presentations, videos, images, comics, texts, etc.) is a good tool and helps me learn English better.	0.0	3.0	3.0	37.5	56.5	4.48	5.00	5	0.701
3	It is uncomfortable to use different modes or resources (e.g. digital whiteboard, PowerPoint presentations, videos, images, texts, etc.) to learn language.	19.5	47.5	13.0	16.5	3.5	2.37	2.00	2	1.081
4	It isn't easy to use different modes or resources (e.g. digital whiteboards, PowerPoint presentations, videos, images, texts, etc.) to work, whether at home or in class.	15.0	24.5	23.0	32.0	5.5	2.89	3.00	4	1.174
5	Using different modes or resources (e.g. digital whiteboard, PowerPoint presentations, videos, images, texts, etc.) and the Internet helps me improve my knowledge and linguistic skills in English.	1.0	1.0	7.0	52.0	39.0	4.27	4.00	4	0.721

Note. M: Mean; MD: Median; MO: Mode; STD: Standard deviation.

**Table 4.** Question items related to the use of multimodal pedagogies

No	Items	Scale (%)					M	MD	MO	STD
		SD	D	N	A	SA				
6	Using different modes or resources (e.g. digital whiteboards, PowerPoint presentations, videos, images, texts, etc.) does not help me learn English better.	25.0	52.0	3.5	10.5	9.0	2.27	2.00	2	1.205
7	The use of multimodal resources in class facilitates my understanding of the lesson content.	1.0	2.0	13.0	54.0	30.0	4.10	4.00	4	0.770
8	The CALL-based multimodal resources used in class provides a rich linguistic context.	0.0	2.0	16.5	63.0	18.5	3.98	4.00	4	0.657
9	Using CALL-based multimodal pedagogical resources in class stimulates my learning interest.	0.0	4.0	16.5	50.5	29.5	4.05	4.00	4	0.785
10	Using CALL-based multimodal learning resources helps me to stay focused in the class.	1.0	5.0	20.0	48.5	25.5	3.93	4.00	4	0.862

Note. M: Mean; MD: Median; MO: Mode; STD: Standard deviation.

makes them uncomfortable. The percentages of figures on this item give a mixture of views, but still, many respondents favor using these kinds of resources in ELT. The mean, median, and mode of this item are 2.37, 2.00, and 2, respectively; the standard deviation is 1.081.

Item number 4 takes the opinions of English language learners about the difficulty in using these multimodal CALL-based resources, to which 32% of respondents agree and 5.5% strongly agree that they find it difficult to use these resources in the classroom, even in the home, 23.0% of respondents are unclear and neutral about this. About 24.5% of respondents disagree, and 15.0% strongly disagree that they do not find it difficult to use CALL-based multimodal resources in classrooms and at home. Item 4 has a mean of 2.89, a median of 3.00, a mode of 4, and a standard deviation of 1.174. Item number 5 asks whether the use of multimodal resources develops the linguistic skills and knowledge of English language learners; in response to this, 52.0% of respondents agree, and 39.0% strongly agree that the CALL-based multimodal pedagogical resources help in developing linguistic skills and knowledge, and some participants are neutral, about 7.0% on this statement. These percentages show that almost 91% of the respondents believe that these resources develop their linguistic skills and knowledge. Only 1.0% of respondents disagree with this statement. This item has a mean of 4.27, a median of 4.00, and a mode of 4, while it has a standard deviation of 0.721.

**Table 4** contains the next items of section 2 of the questionnaire related to the use of multimodal pedagogies. Item number 6 concerns the feedback of English language learners on whether these multiple modes or multimodal resources such as digital whiteboards, videos, and images do not help the learners learn the English language better. In response to this statement, a significant number of participants, out of 200 respondents, 25.0% strongly disagree, and 52.0% disagree with this statement, which shows that using multimodal resources helps English language learners better learn the language. Some of the participants



**Table 5.** Question items related to motivation in English language learning

No	Items	Scale (%)					M	MD	MO	STD
		SD	D	N	A	SA				
11	Learning English is enjoyable when CALL-based multimodal tools are used.	0.5	3.0	11.0	54.0	31.5	4.13	4.00	4	0.759
12	It develops interest when CALL-based multimodal resources (videos, audio, etc.) are used in the classroom.	0.0	3.0	4.0	60.0	33.0	4.23	4.00	4	0.663
13	Using multimodal methods helps me focus better during lessons.	0.0	3.0	16.0	49.0	32.0	4.10	4.00	4	0.770
14	It motivates me to participate actively in the classroom when multimodal materials are used.	2.0	3.0	12.0	52.0	31.0	4.07	4.00	4	0.854
15	CALL-based multimodal tools help building confidence while learning the English language.	0.0	7.0	13.5	53.0	26.5	3.99	4.00	4	0.827

Note. M: Mean; MD: Median; MO: Mode; STD: Standard deviation.

agree with this item; 10.5% of respondents agree, while 9.0% strongly agree, meaning these resources do not help them learn the language. Only a few participants have neutral (3.5%) views. It has a mean of 2.27, a median of 2.00, a mode of 2, and a standard deviation of 1.205. Item number 7 states if these resources facilitate the understanding of lesson content. Significantly positive responses are observed against this statement: 54.0% of respondents agree, while 30.0% strongly agree that these materials improve their understanding of language content.

Some of the participants give neutral views on this, about 13.0%. Only a few language learners disagree with the questionnaire item. Along with the lesson content, its context is very important. This item has a mean of 4.10, a median, and a mode of 4.00 and 4, respectively, and a standard deviation of 0.770. Item number 8 investigates if these resources also provide the linguistic context. Around 80% of the respondents have given positive responses, 63.0% of the respondents agree, and 18.5% strongly agree that these resources provide rich context. Some participants have undefined views on this, too. Only 2.0% of language learners disagree with the given statement. Item 8 has a mean equal to 3.98, and the median and mode are equal to 4.00 and 4; it has a standard deviation equal to 0.657. Item number 9 is closely related to the personal interest of the learners; it states that using CALL-based multimodal pedagogies develops learners' interest in learning language. In response to this item, 50.5% of respondents agree, and 29.5% strongly agree that these resources help build interest in language.

Furthermore, some participants still are unclear, giving neutral views about 16.5%. Only a few, 4.0%, of respondents disagree with this item. Item 9 consists of a mean equal to 4.05, a median equal to 4.00, a mode equal to 4, and a standard deviation equal to 0.785. The last item, item number 10, in the given section, is related to the focus of respondents. In response to the statement that these resources make learners stay focused, 48.5% of respondents agree, and 25.5% strongly agree; it elucidates that these source materials and CALL help learners stay focused. About 20.0% of the participants are undetermined. Only a few language learners, such as 5.0%, think these resources divert their attention. It has a mean of 3.93, a median of 4.00, and mode 4, and the standard deviation is 0.862.

The findings highlighted that motivation is an important factor in making foreign learners learn a language willingly. **Table 5** includes the question items related to motivation in English language learning. Item 11 in the questionnaire states that learning English is enjoyable when CALL-based multimodal tools are used; a highly positive response is observed to this item. 54.0% of the participants agree, and 31.5% of the respondents strongly agree that they find learning enjoyable when CALL-based multimodal tools are involved in teaching and learning the English language. About 11.0% of the participants are unclear about this fact, while some participants, around 3.0%, disagree with this concept. The mean of this item is 4.13, the median is 4.00, the mode is 4, and the standard deviation is 0.759. Item 12 takes English language learners' feedback on developing interest when multimodal sources such as audio or videos are used in the classroom. In response to this, 60.0% of respondents agree, and 33.0% of respondents strongly agree. It means that these resources greatly influence their learning interests in the classroom. Only a few respondents, almost 4.0%, disagree with this statement, meaning these resources do not stimulate their interest in developing language competence, while some have undetermined views.

**Table 6.** Question items related to the motivation in learning the English language

No	Items	Scale (%)					M	MD	MO	STD
		SD	D	N	A	SA				
16	The multimodal resources (visual, audio, text) motivate me to study English regularly.	0.0	8.0	16.5	50.0	25.5	3.39	4.00	4	0.860
17	The use of CALL-based multimodal pedagogy is a fun way to improve the English language.	1.0	4.5	8.0	57.0	29.5	4.10	4.00	4	0.799
18	The multimodal resources (audio, video, interactive apps) make me curious about exploring the language.	2.5	3.5	12.0	53.0	29.0	4.03	4.00	4	0.882
19	CALL-based multimodal pedagogical resources make me enthusiastic about learning the language.	2.0	2.5	12.5	57.5	25.5	4.02	4.00	4	0.814
20	When teachers use multimodal resources, it becomes easy and it motivates me to complete the assignments and projects easily.	0.0	2.0	12.5	57.5	28.0	4.12	4.00	4	0.689

Note. M: Mean; MD: Median; MO: Mode; STD: Standard deviation.

Similarly, to learn a foreign language, it is necessary to stay focused (Ahmad et al., 2024). This item has a mean of 4.23, a median of 4.00, mode 4, and a standard deviation of 0.663. Item number 13 points to take opinion of English language learners that Computer-based multiple resources help them stay focused during lectures or lessons. Many respondents favor this statement; 49.0% agree, and 32.0% strongly agree with this stance. When different sources are used in the lessons, the learners automatically take an interest and try to focus on various things according to their learning style. A minor percentage of respondents, 3.0%, disagree with this, while some participants have a neutral point of view. Item number 13 has a median of 4.10; its median and mode are 4.00 and 4, respectively, while its standard deviation is 0.770. Item 14 interrogates the perspectives of English language learners on whether it helps learners to participate actively in the classroom when multiple sources are used. A markedly optimistic view is noticed among the learners; 52.0% of respondents agree, and 31.0% strongly agree that it motivates them to participate in classroom discussions.

Still, about 12.0% of the participants are neutral about this, also 3.0% disagree and 2.0% of respondents strongly disagree with this item. This item consists of a mean of 4.07, a median, and a mode equal to 4.00 and 4. It consists of a standard deviation of 0.854. Item number 15 is based on confidence building among learners through the use of CALL-based multimodal tools. Enjoying learning builds interest in language learners, making them stay focused, active, and confident (Imran et al., 2024b). In response to item number 15, 53.0% of respondents agree, and 26.5% of respondents strongly agree, while 13.5% of participants have unclear views, and only a few participants, about 7.0%, disagree with this statement. Item number 15 has a mean of 3.99, a median, and a mode equal to 4.00 and 4, respectively. Its standard deviation is 0.827.

**Table 6** contains the remaining items of section 3 of the questionnaire related to the motivation in learning the English language. Item number 16 asks for learners' perspectives that if multimodal resources motivate learners to study English regularly, competence in a language can only be developed by regular reading and study. To item 16, 50.0% of respondents agree, and 25.5% strongly agree that these resources and tools motivate them to learn language effectively. 16.5% responded neutrally, while 8.0% disagreed that these multiple sources do not motivate them to study regularly. Item number 16 has a mean of 3.93; its median and mode are 4.00 and 4, respectively. Its standard deviation is 0.860. Multimodal pedagogies involve resources such as audio, video, digital whiteboards, and many technologically advanced tools. Every learner learns differently according to their learning style; item 17 says these pedagogies are a fun way to learn and improve the English language. In response to this statement, 57.0% of participants agree, and 29.5% of participants strongly agree; this ratio clearly shows that about 90% of English language learners agree that it makes learning a fun way to improve linguistic skills.

Some learners, about 8.0%, act neutrally, while a minor percentage, 4.5%, disagree, and 1.0% strongly disagree, of respondents are against this statement. The mean of item 17 is 4.10, its median and mode are 4.00 and 4, respectively, while its standard deviation is 0.799. In item number 18, the researcher looks into the views of English language learners and whether these multimodal pedagogies make the learners curious to explore the language. 12.0% of the language learners are undefined about their views, while some of the respondents are against this statement, 3.5% disagree, and 2.5% strongly disagree with this stance. However, many respondents have optimistic views regarding their curiosity about the language. 53.0% of language

**Table 7.** Questions related to the relationship between WTC and CALL-based multimodal pedagogies

No	Items	Scale (%)					M	MD	MO	STD
		SD	D	N	A	SA				
21	The use of CALL-based multimodal resources makes me more willing to communicate in English.	1.0	2.0	15.0	60.0	22.0	4.00	4.00	4	0.737
22	CALL-based multimodal pedagogy boosts my confidence in speaking English in and out of class.	2.0	5.0	19.0	49.5	24.5	3.90	4.00	4	0.899
23	The nature of CALL-based multimodal pedagogy is interactive, which helps me during classroom conversations.	1.0	5.0	15.0	61.0	17.5	3.90	4.00	4	0.779
24	The multimodal resources help me express myself easily in English in the classroom.	0.0	2.0	18.5	54.0	25.5	4.03	4.00	4	0.722
25	CALL-based activities encourage me to participate in conversations outside the class too.	0.0	3.5	15.5	57.0	24.0	4.02	4.00	4	0.733

Note. M: Mean; MD: Median; MO: Mode; STD: Standard deviation.

learners agree, and 29.0% of respondents strongly agree that these resources make them more curious to explore the English language day by day. The mean of item 18 is 4.03, its median and mode are 4.00 and 4, respectively, and its standard deviation is 0.882.

Curiosity leads to enthusiasm; when one is curious about learning, he feels more enthusiastic about it. Item 19 asks if the CALL-based multimodal pedagogies make language learners enthusiastic about learning the language. To this item, 57.5% of respondents agree, 25.5% strongly agree that these resources and tools build enthusiasm among learners, 12.5% of participants are still neutral, 2.5% disagree, and 2.0% strongly disagree with this statement. The mean of item 19 is 4.02, its median and mode are 4.00 and 4, respectively, and its standard deviation is 0.814. Item number 20 is related to the involvement of language learners in projects and assignments. The statement says that these multiple helping material sources motivate the language learners to complete the language-related projects easily to which a greatly positive response is observed. 57.5% of respondents agree, and 28.0% strongly agree that it motivates them. 12.5% of respondents are neutral, while 2.0% disagree with this view of the researcher. The mean of item 20 is 4.12, its median and mode are 4.00 and 4, respectively, and its standard deviation is 0.689.

WTC is only developed when learners have linguistic competence and performance. When language learners are motivated, they feel more willing to communicate and participate in discussions either in classroom settings or outside the class. **Table 7** concerns section 4 of the questionnaire, which relates to the relationship between WTC and CALL-based multimodal pedagogies and how these pedagogical resources make learners more willing to communicate. Item 21 asks for English language learners' opinions; it states if using multiple CALL-based resources makes them willing to communicate.

A significantly high percentage of respondents show positive responses to it; 60.0% of respondents agree, and 22.0% strongly agree that these resource materials make them more willing to participate in discussions, as a study by Pawlak et al. (2016) confirms this positive relationship. 15.0% of respondents give neutral views about it, and a small number of respondents disagree with this, about 3.0% of learners are against this view. The mean of item 21 is 4.00, its median and mode are 4.00 and 4, respectively, and its standard deviation is 0.737. When learners are fully confident, they are less worried about the setting in which they are speaking; item 22 is related to boosting learners' confidence to communicate in and out of the class when multimodal pedagogical resources are used. Most of the respondents support this item statement; 49.5% of participants agree, and 24.5% strongly agree, which means that these resources have proven to help build confidence among learners to speak up in and outside the classroom.

Some of the responses are neutral; some respondents are unclear about learning strategies and styles because they do not pay attention to their likes and dislikes, so 19.0% of the participants are neutral, while 5.0% of respondents disagree and 2.0% strongly disagree with this item statement. The mean of item 22 is 3.90, and its median and mode are 4.00 and 4, respectively. Its standard deviation is 0.899. CALL-based multimodal pedagogies are thought to be more interactive as compared to traditional pedagogical resources and tools. Item 23 states if these more interactive source materials help learners in class conversations; in response to this statement, most of the respondents have shown positive responses: 61.0% of respondents agree, and 17.5% of respondents strongly agree that the multimodal pedagogies based on CALL is more interactive and it helps learners during the classroom, 15.0% of language learners have undetermined views.

**Table 8.** Question items related to WTC

No	Items	Scale (%)					M	MD	MO	STD
		SD	D	N	A	SA				
26	I am not anxious about speaking the English language while using CALL-based multimodal resources.	1.0	13.0	22.5	48.0	15.5	3.64	4.00	4	0.930
27	The use of multimodal resources makes me confident and competent to initiate conversations in English.	0.0	4.0	15.0	57.0	24.0	4.01	4.00	4	0.743
28	The CALL-based English classroom sessions encourage me to communicate in English with my classmates.	0.5	4.0	16.5	56.0	23.0	3.97	4.00	4	0.776
29	Using multimodal resources encourages me to speak English in real-life situations.	0.0	5.0	15.0	55.0	25.0	4.00	4.00	4	0.777
30	CALL-based pedagogy helps me to become more open to discussions in English during class.	1.0	2.0	12.5	59.0	25.5	4.06	4.00	4	0.741

Note. M: Mean; MD: Median; MO: Mode; STD: Standard deviation.

These neutral responses show that these learners have unclear views; 5.0% of respondents disagree, and 1.0% strongly disagree with this item. The mean of item 23 is 3.90, and its median and mode are 4.00 and 4, respectively. Its standard deviation is 0.779. Along with linguistic competence, performance is also important. If learners are unable to express themselves, then language competence is useless.

Moreover, item 24 asks the English language learners whether expressing their opinions and views in the target language is made easy through multimodal resources. In response to this item statement, 54.0% of language learners agree, and 25.5% of learners strongly agree. 18.5% of respondents are neutral about it, while 2.0% disagree with this item. The mean of item 24 is 4.03, its median is 4.00, its mode is 4, and its standard deviation is 0.722. Activities, projects, and interactive sessions are very helpful in making learners communicate easily. Item 25 notes respondents' views about the usefulness of the CALL-based activities; it states if these activities encourage language learners to be more willing to communicate and participate in conversations outside the classroom setting in daily life. 57.0% of respondents agree, and 24.0% strongly agree with this item, which means that these resources encourage learners to positively participate in conversations outside the educational setting. 15.5% of respondents are still neutral, while only 3.5% are against this; they do not feel encouraged even when these resources are used. The mean of item 25 is 4.02, its median and mode are 4.00 and 4, respectively, and its standard deviation is 0.733.

**Table 8** contains the remaining items of section 4 of the questionnaire about WTC. More motivated learners feel less anxious and more willing to communicate. Item 26 is all about the anxiousness while communicating in the target language. This item asks the learners using negation that they do not feel anxious while speaking when CALL-based multimodal resources are used, and to this item, a large percentage of respondents have responded that they do not feel anxious. 48.0% of respondents agree, and 15.5% strongly agree, which shows they are less anxious. Many respondents have given neutral views; about 23% of the respondents are unclear, while many language learners disagree with this item, and 13.0% disagree. The mean of item 26 is 3.64, its median and mode are 4.00 and 4, respectively, while its standard deviation is 0.930. For foreign language learners, it is difficult to break the ice and start a conversation, but when they are competent, they can start it. Item 27 concerns language learners' opinions on whether these multimodal resources help them start a conversation. To this statement, 57.0% of respondents agree, and 24.0% strongly agree, which shows that they feel confident enough to start a conversation using these source materials and tools. 15.0% of participants act neutrally, while 4.0% of respondents disagree with this concept of competency and conversation imitation. The mean of item 27 is 4.01, its median and mode are 4.00 and 4, respectively, while its standard deviation is 0.743.

When learners are mocked in the classroom setting, they feel less confident and discouraged to speak up about their point of view. Item number 28 of the questionnaire makes the point clear that the CALL-based language and pedagogical resources encourage language learners to communicate with their classmates in the class. Responding to this item, 56.0% of respondents agree, and 23.0% strongly agree that these source materials encourage communication during classroom sessions. 16.5% of participants picked up the neutral option in the questionnaire, while only 4.0% of the respondents did not agree with this statement. The mean of item 28 is 3.97, its median and mode are 4.00 and 4, respectively, while its standard deviation is 0.776. Along with classroom conversations, taking part in real-life conversations in different social settings is very

important. Item number 29 is regarding the importance of these resources in real-life conversations. To item 29, 55.0% of respondents agree, and 25.0% of respondents strongly agree and have given significantly positive responses. Only 5.0% of respondents disagree with this, but about 15.0% of respondents responded neutrally. The mean of item 29 is 4.00. Its median and mode are 4.00 and 4, respectively, while its standard deviation is 0.741.

The last item, number 30, also relates to the above-discussed items; it states that these pedagogical resources help learners to be more open and active in discussions in the English language. For item 30, a significantly high percentage of positive responses is observed. 59.0% of respondents agree, and 25.5% strongly agree. About 13% of the respondents are still unclear so they responded neutrally. Only 2.0% of respondents disagree, while 1.0% strongly disagree with this item. This means they do not find these resources helpful in communicating openly in English. The mean of item 30 is 4.06, its median and mode are 4.00 and 4, respectively, while its standard deviation is 0.741.

### **Inferential statistical analysis**

In inferential statistical analysis, non-parametric tests are used to check the hypothesis. When the available data does not meet the conditions of a parametric test, such as there is no normal distribution of outcome, unequal variances, or the sample size is small, non-parametric tests are used (Okoye & Hosseini, 2024). These are also useful for analyzing the data presented in ordinal form, ranks, or continuous data. These tests are also known as distribution-free tests. In the research undertaken, two non-parametric tests are used for statistical analysis: the Mann-Whitney U test (Mann & Whitney, 1947) and the Kruskal-Wallis test (Kruskal & Wallis, 1952).

**Mann-Whitney U test:** For conducting these tests, a null hypothesis is required. These statistical tests are actually done to reject or accept the null hypothesis ( $H_0$ ). The null hypothesis for this research study is “there is no relationship of CALL-based multimodal pedagogies with motivation and WTC based on gender and semester.”

The Mann-Whitney U test (Mann & Whitney, 1947) is also known as the rank-sum test or Wilcoxon-Mann-Whitney test. It is used for two independent groups or samples from the same population; it compares the medians (Enright et al., 2016). The significance level of the p-value for this test is 0.05; it says that when the p-value or significance level is less than this value, the null hypothesis is rejected, and when it is higher than this value, the null hypothesis is accepted. **Table 9** gives the particular statements in which the null hypothesis is rejected while the null hypothesis is accepted for the other items. **Table 9** shows the items that reject the null hypothesis. The significance value, or p-value, of the test is 0.05. Any item with a value less than this level rejects the null hypothesis, while those with a value greater than this level accept it.

**Kruskal-Wallis H test:** The Kruskal-Wallis H test (Kruskal & Wallis, 1952) is a non-parametric test for statistical analysis for testing the hypothesis. It assesses three independent sample groups in data that are not normally distributed (Xu, 2023). The means or medians are not used for testing in this test, but the ranks are compared. It, too, needs a null hypothesis, which is already stated above. The critical value for this test is 0.05; if the significance level of the item is less than this value, the hypothesis will be rejected. If the significance level of the item is greater than this value, the null hypothesis will be accepted. **Table 10** states all the items that reject the null hypothesis, while the others accept the null hypothesis. **Table 10** shows the items that reject the null hypothesis. The significance value or p-value of the test is .050. Any item with a value less than this level rejects the null hypothesis, while the items with a greater value accept it.

The current study investigates the opinions of the learners of a Pakistani university, the University of Sahiwal, who are enrolled in English language and Literature. The study undertaken is just a small contribution to the discussion of multimodal pedagogies, which are computer-assisted, and the improvement of motivation and WTC. These techniques used in the classroom encourage language learning among the learners. It encourages the learners to relate language learning with daily life subject matter (Gull et al., 2020; Imran et al., 2024a), and it makes the classrooms more student-centered than teacher-centered, making a huge difference (Harkavy et al., 2021). The largely interactive environment helps language learners acquire linguistic skills and competence, improving their linguistic performance in various settings.



**Table 9.** Hypothesis test summary (Mann-Whitney U test)

No	Null hypothesis	Sig. <sup>a,b</sup>	Decision
1	The distribution of "I like learning when different types of resources are used in English classes" is the same across categories of gender.	.047	Reject
2	The distribution of "it is uncomfortable to use different modes or resources (e.g. digital whiteboard, PowerPoint presentations, videos, images, texts, etc.) to learn language" is the same across categories of gender.	.017	Reject
3	The distribution of "it isn't easy to use different modes or resources (e.g. digital whiteboards, PowerPoint presentations, videos, images, texts, etc.) to work, whether at home or in class" is the same across categories of gender.	.007	Reject
4	The distribution of "using different modes or resources (e.g. digital whiteboards, PowerPoint presentations, videos, images, texts, etc.) does not help me learn English better" is the same across categories of gender.	.005	Reject
5	The distribution of "it develops interest when CALL-based multimodal resources (videos, audio, etc.) are used in the classroom" is the same across categories of gender.	.035	Reject
6	The distribution of "using multimodal methods helps me focus better during lessons" is the same across categories of gender.	.028	Reject
7	The distribution of "it motivates me to participate actively in the classroom when multimodal materials are used" is the same across categories of gender.	.036	Reject
8	The distribution of "CALL-based multimodal tools help improve confidence while learning the English language" is the same across categories of gender.	.011	Reject
9	The distribution of "the use of CALL-based multimodal pedagogy is a fun way to improve the English language" is the same across categories of gender.	.047	Reject
10	The distribution of "CALL-based multimodal pedagogical resources make me enthusiastic about learning the language" is the same across categories of gender.	.018	Reject
11	The distribution of "the nature of CALL-based multimodal pedagogy is interactive which helps me during classroom conversations" is the same across categories of gender.	.039	Reject
12	The distribution of "the multimodal resources help me express myself easily in English in the classroom" is the same across categories of gender.	.027	Reject
13	The distribution of "using multimodal resources encourages me to speak English in real-life situations" is the same across categories of gender.	< .001	Reject

<sup>a</sup> The significance level is 0.50

<sup>b</sup> Asymptotic significance is displayed

**Table 10.** Hypothesis test summary (Kruskal-Wallis H test)

No	Null hypothesis	Sig. <sup>a,b</sup>	Decision
1	The distribution of "I like learning when different types of resources are used in English classes" is the same across categories of semester.	.035	Reject
2	The distribution of "it isn't easy to use different modes or resources (e.g. digital whiteboards, PowerPoint presentations, videos, images, texts, etc.) to work, whether at home or in class" is the same across categories of the semester.	<.001	Reject
3	The distribution of "using CALL-based multimodal pedagogical resources in class stimulates my learning interest" is the same across categories of the semester.	<.001	Reject
4	The distribution of "CALL-based multimodal pedagogical resources make me enthusiastic about learning the language" is the same across categories of semester.	.012	Reject
5	The distribution of "when teachers use Multimodal resources, it becomes easy and it motivates me to complete the assignments and projects easily" is the same across categories of semester.	.002	Reject
6	The distribution of "the use of multimodal resources makes me confident and competent to initiate conversations in English" is the same across categories of semester.	.017	Reject
7	The distribution of "the CALL-based English classroom sessions encourage me to communicate in English with my classmates" is the same across categories of the semester.	.048	Reject

<sup>a</sup> The significance level is 0.50

<sup>b</sup> Asymptotic significance is displayed

The evaluation tasks, such as assignments or other practical works, were very helpful in motivating the language learners to use the target language (Fedorenko et al., 2021). The current work studies the perceptions of these English language learners about the impact of using CALL and CALL-based multimodal pedagogies in motivating the language learners and promoting their WTC. These modern ways of teaching facilitate language learners.

The responses received from the questionnaire show the extent to which the respondents agree that multimodal pedagogies improve their motivational attitude and WTC. The questionnaire is divided into three



portions that have question items, and each portion deals with one concept: multimodal pedagogies, motivation, and WTC, respectively. The responses to the questionnaire show that language learners are in favor of the use of CALL-based multimodal resources. These resources make them more curious about learning a language, the tasks involved in these are practical, the learning is more interactive, it is considered a fun way to improve language and many more.

## CONCLUSION

Considering the research's analysis and findings, it can be concluded that multimodal pedagogical resources play a crucial role in English language learning. With technological advancement, multimodality has also become a center of attention for everyone, particularly foreign language learners. In EFL, the technology is greatly integrated to support and promote interactive learning. WTC in L2 needs more modern approaches and multimodality and CALL are considered among those new approaches. When multiple modes of language teaching are used every learner gets a vast understanding of each thing depending upon their learning style. Multimodal pedagogy is a new teaching approach that connects different modes to convey a particular idea.

The findings of this study encourage teachers to use multimodal pedagogical resources to improve learning and make the classroom sessions more interactive through learner participation and engagement. The study tries to meet the goals and objectives set at the beginning. It is observed that the language learners agree that the CALL-based multimodal resources enhance the learners' motivation. Secondly, when the learners are motivated to use a language, they try to learn it, and when they learn it, they will be more willing to communicate in the target language, which is also observed from the findings. Thirdly, the sole purpose of using multimodal resources is to encourage the English language learners to learn and use the target language. The research finds that the learners have a positive response and attitude toward using multimodal pedagogies in language learning in EFL classrooms. The responses are analyzed descriptively on SPSS 29, while the statistical analysis uses non-parametric tests to analyze abnormally distributed samples from the population. The strength of the questionnaire is checked through the validity and reliability analysis.

## Recommendations

The current study found that using CALL-based multimodal pedagogical resources helps motivate learners and makes them more willing to communicate. Therefore, it is recommended that the English language teachers must include the multimodal resources in teaching the learners. The administration of the institutes and policymakers need to understand the impact of CALL-based multimodal pedagogies on language learners so that the policies will be altered accordingly. First, the teachers must be aware of CALL and multimodality; the administration should provide opportunities for proper training and teaching on how to involve this modern way to improve a foreign language. Teachers can only implement new and modern ways of teaching if they have proper training, skills, and knowledge.

As observed from the findings, implementing these resources makes learning more interactive and fun; it makes the learners curious about the target language; it builds confidence to communicate inside the classroom setting or outside; it has numerous benefits if implemented correctly. Future researchers can help from the current study's findings; these resources and CALL make the learners competent, and academic performance can be improved. These recommendations are only made based on the results and findings from the current study; it involves the participants from one particular setting; hence, it may require alterations and adjustments for its application to any other population or a broader educational setting

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**Data availability:** Data generated or analyzed during this study are available from the authors on request.

## REFERENCES

- Adara, R. A., & Haqiyah, A. (2021). Improving Indonesian EFL learners' motivation through computer-assisted learning (CALL). *Journal of English Language Studies*, 6(1), 110–121. <https://doi.org/10.30870/jels.v6i1.9119>
- Ahmad, M., Mahmood, M. A., Siddique, A. R., Imran, M., & Almusharraf, N. (2024). Variation in academic writing: A corpus-based investigation on the use of syntactic features by advanced L2 academic writers. *Journal of Language and Education*, 10(3), 25–39. <https://doi.org/10.17323/jle.2024.21618>
- Asad, M. M., Shahzad, S., Shah, S. H. A., Sherwani, F., & Almusharraf, N. M. (2024). ChatGPT as artificial intelligence-based generative multimedia for English writing pedagogy: challenges and opportunities from an educator's perspective. *The International Journal of Information and Learning Technology*, 41(5), 490–506. <https://doi.org/10.1108/IJILT-02-2024-0021>
- Aziz, A., & Shakir, A. (2023). Exploring desirability and feasibility of learner autonomy: College English language teachers' beliefs in the Pakistani context. *Linguistic Forum-A Journal of Linguistics*, 5(2), 85–102.
- Aziz, A., Mahmood, M. A., Ahmad, S., & Akbar, N. (2021). A corpus-based study of genre-specific discourse: MA TEFL thesis abstracts. *Journal of Language and Linguistic Studies*, 17(S2), 884–898. <https://doi.org/10.17263/jlls.904084>
- Billore, S., & Rosén, C. (2016). A cross-cultural study of attitudes to digital tools among students and teachers in the European language classroom. In *Proceedings of the International Symposium on Digital Humanities: Book of Abstracts* (pp. 18–20).
- de Souza, R., Parveen, R., Chupradit, S., Velasco, L. G., Arcinas, M., Tabuena, A. C., Pentang, J. T., & Ventayen, R. J. M. (2021). Language teachers' pedagogical orientations in integrating technology in the online classroom: Its effect on students motivation and engagement. *Turkish Journal of Computer and Mathematics Education*, 12(10), 5001–5014. <https://doi.org/10.2139/ssrn.3844678>
- Dörnyei, Z., & Ushioda, E. (2021). *Teaching and researching motivation*. Routledge. <https://doi.org/10.4324/9781351006743>
- Enright, E. F., Gahan, C. G., Joyce, S. A., & Griffin, B. T. (2016). The impact of the gut microbiota on drug metabolism and clinical outcome. *The Yale Journal of Biology and Medicine*, 89(3), Article 375.
- Fedorenko, S. (2018). Humanistic foundations of foreign language education: Theory and practice. *Advanced Education*, 5(10), 27–31. <https://doi.org/10.20535/2410-8286.142319>
- Fedorenko, S., & Kravchenko, T. (2023). Multimodal resources and students' motivation in English for specific purposes. *Arab World English Journal*, 14(1), 59–70. <https://doi.org/10.24093/awej/vol14no1.4>
- Fedorenko, S., Voloshchuk, I., Sharanova, Y., Glinka, N., & Zhurba, K. (2021). Multimodality and digital narrative in teaching a foreign language. *Arab World English Journal*, (7), 178–189. <https://doi.org/10.24093/awej/call7.13>
- Gardner, R. C., & Lambert, W. E. (1972). *Attitudes and motivation in second-language learning*. Newbury House Publishers.
- Golonka, E. M., Bowles, A. R., Frank, V. M., Richardson, D. L., & Freynik, S. (2014). Technologies for foreign language learning: A review of technology types and their effectiveness. *Computer Assisted Language Learning*, 27(1), 70–105. <https://doi.org/10.1080/09588221.2012.700315>
- Grenner, C., & Hagelin Jönsson, N. (2019). The effect of the use of CALL on pupils' motivation and language development in English. *DIVA Portal*. <https://www.diva-portal.org/smash/get/diva2:1496203/FULLTEXT01.pdf>
- Guichon, N., & Cohen, C. (2016). Multimodality and CALL. In F. Farr, & L. Murray (Eds.), *The Routledge handbook of language learning and technology* (pp. 509–521). Routledge.
- Gull, A., Imran, M., Yiunas, M., & Afzaal, M. (2020). A descriptive study of challenges faced by English language teachers in integrating information and communication technology (ICT) tools at elementary level in Pakistan. *International Journal of Advanced Science and Technology*, 29(8), 290–305.

- Gutierrez, J. S., Huamán-Romaní, Y. L., Burga-Falla, J. M., Cusilayme-Barrantes, H. C. B., & Zegarra, S. D. R. O. (2024). I'm all ears: Teachers support in CALL and its nuances on EFL learners' resilience, willingness to communicate, and academic well-being. *Computer-Assisted Language Learning Electronic Journal*, 25(4), 578–603.
- Halliday, M. A. K. (1978). *Language as social semiotic: The social interpretation of language and meaning*. Hodder Arnold.
- Harkavy, I., Bergan, S., Gallagher, T., & Van't Land, H. (2021). Universities must help shape the post-COVID-19 world. In *Higher education's response to the COVID-19 pandemic: Building a more sustainable and democratic future* (21–29).
- Hewitt, E., & Stephenson, J. (2012). Foreign language anxiety and oral exam performance: A replication of Phillips's MLJ study. *The Modern Language Journal*, 96(2), 170–189. <https://doi.org/10.1111/j.1540-4781.2011.01174.x>
- Hinton, D. E., Pham, T., Tran, M., Safren, S. A., Otto, M. W., & Pollack, M. H. (2004). CBT for Vietnamese refugees with treatment-resistant PTSD and panic attacks: A pilot study. *Journal of Traumatic Stress: Official Publication of The International Society for Traumatic Stress Studies*, 17(5), 429–433. <https://doi.org/10.1023/B:JOTS.0000048956.03529.fa>
- Huang, H., & Li, M. (2024). The impact of technology-enhanced language learning environments on second language learners' willingness to communicate: A systematic review of empirical studies from 2012 to 2023. *Language Learning & Technology*, 28(1).
- Imran, M., & Almusharraf, N. (2024). Digital learning demand and applicability of quality 4.0 for future education: A systematic review. *International Journal of Engineering Pedagogy*, 14(4). <https://doi.org/10.3991/ijep.v14i4.48847>
- Imran, M., Almusharraf, N., Abdellatif, M. S., & Ghaffar, A. (2024a). Teachers' perspectives on effective English language teaching practices at the elementary level: A phenomenological study. *Heliyon*, 10(8). <https://doi.org/10.1016/j.heliyon.2024.e29175>
- Imran, M., Almusharraf, N., Ahmed, S., & Mansoor, M. I. (2024b). Personalization of e-Learning: Future trends, opportunities, and challenges. *International Journal of Interactive Mobile Technologies*, 18(10). <https://doi.org/10.3991/ijim.v18i10.47053>
- Jaramillo C. N., & Nadolny, L. (2023). Willingness to communicate and oral communicative performance through asynchronous video discussions. *Language Learning & Technology*, 27(1), 1–23.
- Jewitt, C. (2013). Multimodal methods for researching digital technologies. In S. Price, C. Jewitt, & B. Brown (Eds.), *The SAGE handbook of digital technology research* (pp. 250–265). <https://doi.org/10.4135/9781446282229.n18>
- Kazu, İ. Y., & Kuvvetli, M. (2023). A triangulation method on the effectiveness of digital game-based language learning for vocabulary acquisition. *Education and Information Technologies*, 28(10), 13541–13567. <https://doi.org/10.1007/s10639-023-11756-y>
- Kress, G., & van Leeuwen, T. (2020). *Reading images: The grammar of visual design*. Routledge. <https://doi.org/10.4324/9781003099857>
- Lai, H. Y. T. (2013). The motivation of learners of English as a foreign language revisited. *International Education Studies*, 6(10), 90–101. <https://doi.org/10.5539/ies.v6n10p90>
- Lange, C., & Costley, J. (2020). Improving online video lectures: Learning challenges created by media. *International Journal of Educational Technology in Higher Education*, 17, 1–18. <https://doi.org/10.1186/s41239-020-00190-6>
- MacIntyre, P. D. (2007). Willingness to communicate in the second language: Understanding the decision to speak as a volitional process. *The Modern Language Journal*, 91(4), 564–576. <https://doi.org/10.1111/j.1540-4781.2007.00623.x>
- MacIntyre, P. D., Clément, R., Dörnyei, Z., & Noels, K. A. (1998). Conceptualizing willingness to communicate in an L2: A situational model of L2 confidence and affiliation. *The Modern Language Journal*, 82(4), 545–562. <https://doi.org/10.1111/j.1540-4781.1998.tb05543.x>
- Mann, H. B., & Whitney, D. R. (1947). On a test of whether one of two random variables is stochastically larger than the other. *The Annals of Mathematical Statistics*, 18(1), 50–60. <https://doi.org/10.1214/aoms/1177730491>

- Maqbool, M. A., Asif, M., Imran, M., Bibi, S., & Almusharraf, N. (2024). Emerging e-learning trends: a study of faculty perceptions and impact of collaborative techniques using fuzzy interface system. *Social Sciences & Humanities Open*, 10, Article 101035. <https://doi.org/10.1016/j.ssaho.2024.101035>
- Marzá, N. E., & Gómez, I. F. (2022). New genres and new approaches: Teaching and assessing product pitches from a multimodal perspective in the ESP classroom. *Porta Linguarum Revista Interuniversitaria de Didáctica de las Lenguas Extranjeras*, (38), 65–81. <https://doi.org/10.30827/portalin.vi38.21621>
- Okoye, K., & Hosseini, S. (2024). Mann-Whitney U test and Kruskal-Wallis H test statistics in R. In K. Okoye, & S. Hosseini (Eds.), *R programming: Statistical data analysis in research* (pp. 225–246). Springer. [https://doi.org/10.1007/978-981-97-3385-9\\_11](https://doi.org/10.1007/978-981-97-3385-9_11)
- Pawlak, M., Mystkowska-Wiertelak, A., & Bielak, J. (2016). Investigating the nature of classroom willingness to communicate (WTC): A micro-perspective. *Language Teaching Research*, 20(5), 654–671. <https://doi.org/10.1177/1362168815609615>
- Peng, J. E., & Woodrow, L. (2010). Willingness to communicate in English: A model in the Chinese EFL classroom context. *Language Learning*, 60(4), 834–876. <https://doi.org/10.1111/j.1467-9922.2010.00576.x>
- Perez, M. M. (2020). Multimodal input in SLA research. *Studies in Second Language Acquisition*, 42(3), 653–663. <https://doi.org/10.1017/S0272263120000145>
- Sari, A. B. P. (2020). WhatsApp-based speaking test in EFL context. *Journal of English Language Studies*, 5(2), 175–188. <https://doi.org/10.30870/jels.v5i2.8289>
- Shrestha, N. (2021). Factor analysis as a tool for survey analysis. *American Journal of Applied Mathematics and Statistics*, 9(1), 4–11. <https://doi.org/10.12691/ajams-9-1-2>
- Tomlinson, B. (2012). Materials development for language learning and teaching. *Language Teaching*, 45(2), 143–179. <https://doi.org/10.1017/S0261444811000528>
- Tran, T. M. L. (2024). Blended learning in EFL classrooms at a Vietnamese university from students' perspectives. *International Journal of TESOL & Education*, 4(2), 99–117. <https://doi.org/10.54855/ijte.24426>
- Xu, J. (2023). *Extensions of the Mann-Whitney U test* [Honor's thesis, Dalhousie University].
- Yashima, T. (2002). Willingness to communicate in a second language: The Japanese EFL context. *The Modern Language Journal*, 86(1), 54–66. <https://doi.org/10.1111/1540-4781.00136>
- Younas, M., Imran, M., Noor, U., & Khaled, S. (2019). Role of ESL instructors and learners' attitude to use pedagogical techniques in developing reading skills at the secondary level: A case study of Lahore, Pakistan. *Al-Qalam*, 24(1), 411–425.

