

**THE IMPACT OF CAPT ON PRONUNCIATION
ACCURACY: AN EXPERIMENTAL STUDY OF
PAKISTANI ENGLISH LANGUAGE LEARNERS**

By

SAMINA YASMIN KHATTAK



NATIONAL UNIVERSITY OF MODERN LANGUAGES,

MULTAN CAMPUS

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The undersigned certify that they have read the following thesis, examined the defense, are satisfied with the overall exam performance, and recommend the thesis to the Faculty of Arts & Humanities for acceptance:

Thesis Title: The Impact of Capt on Pronunciation Accuracy: An Experimental Study of Pakistani English Language Learners

Submitted by: Samina Yasmin Khattak

65MPHIL/LNG/MTN/S22

Registration:

Dr. Faiza Masood

Name of Research Supervisor

Signature of Supervisor

Dr. Muhammad Akbar Sajid

Name of Head of Department of English

Signature of HOD

Dr. Arshad Mahmood

Name of Dean (FAH)

Signature of Dean (FAH)

Date

AUTHOR'S DECLARATION

I, Samina Yasmin Khattak

Daughter of Gul Janan Khan Khattak

Registration # 65MPHIL/LNG/MTN/S22

Discipline English Linguistics

Candidate of **Master of Philosophy** at the National University of Modern Languages do hereby declare that the thesis **The Impact of Capt on Pronunciation Accuracy: an Experimental Study of Pakistani English Language Learners** submitted by me in partial fulfilment of MPhil degree, is my original work, and has not been submitted or published earlier. I also solemnly declare that it shall not, in future, be submitted by me for obtaining any other degree from this or any other university or institution.

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ABSTRACT

This study explores the effectiveness of Computer-Assisted Pronunciation Training (CAPT) in improving the pronunciation accuracy of fifth-grade students at Falcon House Grammar School in Multan, Pakistan. This research included 50 students from the 2023-2024 academic session who were divided into control and experimental groups. Quasi experimental design was used for study, and purposive sampling was employed to select participants. Cambridge Online Dictionary was used as the primary reference for pronunciation, ensuring a widely accepted and standardized source for evaluation. A pretest was taken to evaluate students' pronunciation accuracy level before the CAPT treatment, then a six-week CAPT program was delivered to the experimental group. During this time period the experimental group of students carried out focused pronunciation exercises using CAPT software, whereas the control group continued to use traditional instruction, without technological enhancement. After a six week period both groups were given post tests to see if there had been any improvement in pronunciation. An analysis of test scores showed that test scores of the experimental group were exceedingly higher than those of the control group, thus suggesting that CAPT enhances pronunciation. These findings show that CAPT is a potential and practical tool to enhance English pronunciation, in Pakistani contexts of education, especially where pronunciation has normally been taught by rote learning but without any technological aid. Moreover, the study also suggests that CAPT could also be used and integrated within the broader educational policies and curricula to solve the pronunciation challenges in non native English speaking countries such as Pakistan.

Keywords: CAPT, Pronunciation Accuracy, Quasi Experimental Research, English Language Learners, Cambridge Online Dictionary

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LIST OF ABBREVIATIONS

CAPT: Computer-assisted Pronunciation Training

CALL: Computer-assisted Language Learning

ESL: English as a Second Language

TELL: Technology-Enhanced Language Learning

PELL: Pakistani English Language Learners

ELL: English Language Learners

EFL: English as a Foreign Language

SLA: Second Language Acquisition

ELF: English as a Lingua Franca

FL Foreign Languages

SPSS Statistical Package for the Social Sciences

ANOVA Analysis of Variance

TPACK: Technology Pedagogical Content Knowledge

SLM: Speech Learning

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DEDICATION

To my dearest mother,

For all of the years I was pursuing my academics, your love, support, and all the things you did for me are the beacon that guided me. Your faith in my potential has been my source of strength during the struggles; and happiness in every achievement. This thesis is dedicated to you, to the one who supports me wholeheartedly all throughout and believes in me always.

CHAPTER 1

INTRODUCTION

This chapter presents the importance of pronunciation as an effective aspect of a language and discusses the background of the study, problem statement, significance of the study, objectives of the research, research question, hypothesis, delimitation, chapter breakdown, and definitions of terms.

1.1 Importance of Pronunciation

Learning accurate pronunciation is essential in the study of any language since it directly impacts the capacity of speakers to transmit and understand messages. Students of a second language, whether their pronunciation is acceptable or not sufficient, need to be able to communicate fluently with native speakers in general (having accurate pronunciation). The ability to converse verbally with native speakers of English is severely hindered if a non-native speaker's pronunciation is below average level, regardless of how well the non-native speaker knows English syntax and vocabulary. This is true regardless of the speaker's level of English proficiency (Celce-Murcia et al., 2010).

When someone pronounces accurately, he/she is considered well educated, well mannered, and is considered a symbol of higher social positions. Conversely, poor pronunciation lacks good quality of education, manners, and higher social positions. Poor pronunciation could lead to social discrimination and negative evaluation. Accurate pronunciation has come to be recognized as one of the cornerstones of language learning in recent years. It is essential to have accurate pronunciation to have efficient communication, and the capacity of language learners to comprehend native speakers and to be understood by them is heavily dependent on their pronunciation abilities. On the other hand, pronunciation is a topic that is often neglected in language schools, and instructors do not give this topic the attention that it warrants. Learners' failure to speak effectively and their progress in language acquisition are both hampered by the fact that pronunciation is not given sufficient attention to instruction.

One of the most difficult aspects of learning English is pronunciation, and its causes may be found at every stage of education, from kindergarten to graduate

school. This challenge stays with students throughout their entire academic careers and continues to be a problem for them when they enter the workforce or other areas of practical life. However, this is a persistent issue with prospective teachers. In that case, the Illness will be passed on to the next generation when those prospective teachers immediately begin practical teaching after they graduate without being aware of their incorrect pronunciation of the English language. This will perpetuate the problem for the following generation. Despite the educators' best intentions, some students still have difficulty pronouncing English correctly, despite the usage of textual pronunciation material either given by the course outlines or self-created by the educator. One empirical investigation concluded that a certain degree of English pronunciation is required for successful communication. The ability to converse verbally with native speakers of English is severely hindered if a non-native speaker's pronunciation is below this level, regardless of how well the non-native speaker knows English syntax and vocabulary. This is true regardless of the speaker's level of English proficiency (Celce-Murcia et al., 2010)

1.2 Definition of terms

Computer-Assisted Pronunciation Training (CAPT): The term "Computer-Assisted Pronunciation Training" (CAPT) refers to the process of enhancing learners' pronunciation abilities in a second or foreign language via the employment of computer-based tools and software. In order to aid students in increasing the correctness of their pronunciation, CAPT consists typically of interactive activities, feedback systems, and voice recognition technologies. (Wong, & Shintani,. 2021)

Pronunciation Accuracy: The extent to which an individual accurately imitates phonological and phonetic features of certain words, phrases or sentences in a given language is the extent to which he or she has attained the standard pronunciation of that language. Some aspects of a second language that may be defined as important by Derwing and Munro (2015) include the manner of articulation, the stress, intonation and rhythm.

Experimental Study: The research design of experimentation is intended where the researcher changes one or more independent variables and at the same time puts into consideration the effect of the change on a dependent variable, while strictly controlling for the extraneous variables. A quasi experimental study is further a sub

category whereby the use of experimental method is partly applied as a research design. Stated by Campbell and Stanley (2015) , this research design makes it possible to conclude the reasons behind the observed results and the link between the modified variables.

Pakistani English Language Learners: Pakistani English Language Learners are those who are currently learning the English language as a second or a foreign language from Pakistan right now.

1.3 CAPT

Computer-assisted pronunciation training is known as the sub field of computer-assisted language learning (CALL) for learning pronunciation accurately. In this research, the subject of interest is the impact of the teaching of pronunciation employing CAPT on the pronunciation achievement of the learners.

Learners of a new language could be easily trained with the help of computer aided pronunciation training tools which include different technological facilities and programs helpful in training the learners in accurate pronunciation. In CAPT systems, speech recognition technology is often used to evaluate student pronunciation and provide corrections. The usage of CAPT systems in learning a second language is widespread because of their adaptability. Using real-time feedback, error identification, and correction recommendations, they hope to assist students in improving their pronunciation. The learner's pronunciation is compared to a model of native or non-native pronunciation after feedback, which teaches speakers how to pronounce words accurately.

The World Wide Web is emerging as a resource for language acquisition, which has garnered much attention over the previous 10 years. According to Crossman (1997), when compared to other forms of instructional technology, web-based learning is expanding at a rate that is far quicker than that of any other technology. The continuous dispute on the best way to teach pronunciation to students of varying skill levels presents a common source of difficulty for instructors of foreign languages (FL). For many reasons, including a lack of expertise, students' lack of interest, or class time, some educators may dislike addressing pronunciation in the classroom (Derwing & Munro, 2005)

According to O'Brien, & Levis, (2017) computer-assisted pronunciation training (CAPT), defined as the use of technology to support pronunciation practice and the provision of feedback, has received interest due to its ability to deliver specialised and interactive learning experiences. The purpose of CAPT platforms is to offer learners real-time feedback on their pronunciation inaccuracy, hence promoting both self-correction and progress. This is accomplished via the use of voice recognition technology and interactive activities.

In addition, some educators could be hesitant to instruct students on accurate pronunciation because they need more training in phonetics (Weinberg & Knoerr, 2003). It is easier to teach pronunciation in a course devoted to teaching pronunciation, phonology, or phonetics rather than in a classroom setting devoted to studying languages. Students who start learning a language at a younger age may not have the opportunity to participate in systematic pronunciation training until much later in their language-learning careers since these sessions are often only offered at the higher levels (Ducate & Lomicka, 2009).

Even though their home country is where English is not the most prevalent native language, students whose first language is not English opt to study in their host country via English. In countries where English is not the official language, students seldom have the opportunity to hear the language spoken with its native accent. These students have yet to be exposed to the language in its native environment, where it is spoken and written by fluent speakers. By "genuine materials," we mean the kinds of written and spoken language resources native speakers' use in real-world situations. Words or writing may be genuine forms of expression (Rogers & Medley, 1988).

1.4 Background of the Study

Pronunciation accuracy plays a crucial role in language learning, especially for learners of English as a second language (ESL). It's hard for non-native speakers to achieve intelligibility, and to reduce the errors in the pronunciation. English is not the first language for Pakistan, and learners face difficulties with accurate English pronunciation caused by interference from the first languages, including Urdu, Punjabi, Saraiki, Pashto, and others. They can hamper communication and overall speaking skills. Computer Assisted Pronunciation Training (CAPT) systems offer

individuals the chance to practice pronunciation and receive feedback immediately, as well as individualized learning experiences (Neri et al., 2002).

CAPT tools concentrate on pronunciation features, such as phonemes, intonation and rhythm, and provide real time analysis and feedback on learners' performance. According to Derwing and Munro (2015), the use of pronunciation instruction that is complimented by technology will go a long way in helping learners to recognize their mistakes and thus improve their pronunciation accuracy. In Pakistan, the class size is often very large and there is often a great lack of materials for individualised pronunciation practice, thus CAPT could be a useful tool for improving learners' pronunciation. (Abbasi et al., 2020).

Many research studies have proven the effectiveness of CAPT on language learners. For example, a study by Neri et al., (2008) shows that CAPT not only increases the pronunciation of individual phonemes, but also of communicative competence in general. CAPT has also been proven to motivate learners and engage them in language learning since it provides an interactive and responsive space in which the program can cater to students needs (Levis, 2007). Yet, the use of CAPT in the context of Pakistani learners with unique linguistic and educational challenges, requires more research.

The implementation and impact of this method among Pakistani English Language Learners, however, is still yet to be well understood. The phonological differences between English and the languages spoken by Pakistani learners, including Urdu, Pashto, Saraiki, Balochi, and Punjabi, etc., makes the pronunciation a challenging task for Pakistani learners. Usually, these problems are segmental errors, vowel reduction, and stress placement issues. (Hanif, 2021). As pronunciation is essential for effective communication and because CAPT has potential to be an efficient pedagogical tool, the specific purpose of this study is to investigate how the use of CAPT influences the pronunciation accuracy of Pakistani learners of English. This will evaluate the degree to which CAPT tools can enhance the phonetic accuracy of learners whose native languages lack some of the sounds that are being acquired. Furthermore, this research will generate insights into the practical implications of combining CAPT in the Pakistani ESL context, one where traditional ways of learning the language dominate.

1.5 Statement of the Problem

The fluency and accuracy of English pronunciation still emerges as a significant problem of the Pakistanis who are learning English as a second language. In this regard, learners would require higher frequency exposure to native language models and more appealing and dynamic language practice. One major challenge of CAPT for improving pronunciation is how to give accurate and constructive feedback of learners' pronunciation errors. Pronunciation is a challenging part of learning language because it involves making and distinguishing sounds in a speech that a speaker's first language does not have. This means that students need a tremendous amount of practice to improve their pronunciation. Hence, CAPT programs offer valuable visual and auditory models of accurate pronunciation, they must also be able to effectively assess learner performance and provide meaningful feedback based on that assessment. Therefore, to overcome the problem, the present study attempts to improve students' pronunciation with CAPT of 5th grade at Falcon House School Multan, Pakistan.

1.6 Objectives of the Study

The objective of this research is:

- To know the impact of teaching pronunciation through CAPT technology at primary level students.

1.7 Research Questions

The present study answered the following research question:

- Does teaching pronunciation through CAPT technology work better than using conventional methods in the classroom at primary level?

1.8 Hypothesis

The hypotheses of the present study is as under:

Null Hypothesis (H_0): There is no significant improvement in the pronunciation of students taught using CAPT technology at primary level.

Alternative Hypothesis (H_a): There is a significant improvement in the pronunciation of students taught using CAPT technology at primary level.

1.9 Significance of the Study

This study holds significant pedagogical value, offering multiple contributions to the field of English language instruction. Firstly, it provides practical advancements in teaching and learning English pronunciation, addressing both teacher and student needs. Secondly, it serves as a resource for researchers, educators, and learners by introducing innovative methods and strategies for more effective pronunciation instruction. Thirdly, its findings could facilitate the implementation of these techniques within various educational settings, enhancing curriculum design. Finally, by promoting the use of online dictionaries for pronunciation practice, the study not only improves students' pronunciation skills but also broadens their vocabulary, contributing to overall language proficiency.

1.10 Delimitation

Due to time constraints, the present research was delimited only to the fifth class (primary level) of Falcon House School, Multan. The main aim of the study is to highlight the pronunciation achievement of students using the CAPT technique. The study only focuses on one aspect of “pronunciation” being taught through CAPT.

1.11 Chapter Breakdown

This research thesis has five chapters. The first chapter introduces the significance of learning pronunciation in the English Language, especially the effect of CAPT in teaching and learning pronunciation. This chapter aims to introduce the use of technology strategy in English language teaching. The statement of the problem, objectives of the study, and significance of the study is described in detail. The chapter also highlights the delimitation of the study.

The second chapter evaluates the related literature on teaching pronunciation through CAPT and advanced technology. This chapter describes what others have done in the field and what contribution is made by this research to the present knowledge of the field.

The third chapter introduces the research methodology of the study. It includes the research method, sample, population, research instruments, and other relevant pertinent details.

The fourth chapter discusses the results and analysis of both groups' pretest and post-test scores. It gives a detailed discussion and interpretation of the researcher's results. The fifth chapter presents a comprehensive analysis of the findings and a discussion of the current research. This section also discusses the potential areas of inquiry for further research.

CHAPTER 2

LITERATURE REVIEW

Pronunciation is an essential component of every language, and it has a significant influence, particularly in terms of the acquisition and instruction of communicative competence among students. In comparison to vocabulary and grammar, pronunciation is considered to be of greater importance (Harmer, 2001). It is possible that a student might benefit from having accurate pronunciation since it would make communication simpler, more comfortable, and more effective (Varasarin, 2006). In contrast, Miller (2004) emphasises that pronunciation has an impact on an individual's self-esteem as well as their degree of confidence to speak in a way that is understood. To this day, pronunciation has been completely disregarded throughout the whole of the process of language acquisition (Gilner, 2008; Baker & Murphy, 2011). On the other hand, in the Pakistani context, it has always been overlooked when it comes to the process of learning a language, and it is believed that pronunciation is learned via the other abilities of the language rather than paying attention to oral competence (Mansoor, 2005). It is also overlooked all over the globe, and there is no attention provided to the development of this talent in classrooms where language acquisition is being taught (Gilner, 2008; Baker & Murphy, 2011; Derwing, 2010). In addition to being referred to as a "Marginalised Topic," it is also seen as "an ESL/EFL orphan" of the English language family. According to Gilakjani and Ahmadi (2011), "second language pronunciation is a topic of great theoretical interest and practical relevance which unfortunately has been out of fashion for some decades" (p. 81). As a result, the issue has been out of favour for quite some time. It has been asserted by Celce-Murcia, Brinton, and Goodwin (2010) that there is a minimal likelihood of efficient communication in the absence of precise pronunciation. It is said that "the way we sound when we speak a foreign language has a strong influence on the assumptions that other people make about us and the judgments that they make about the kind of people we are" (Gilakjani, 2011).

2.1 Introduction

The introduction of digital technology has brought about a change in the manner in which languages are not only taught but also learnt, notably in the field of pronunciation instruction. CAPT has emerged as a crucial instrument that has the

promise of bringing about considerable improvements in the learning of phonetic abilities among language learners. However, it is of primary concern in cases where the phonological pattern of language of the native speaker is so different from the phonological patterns of the target language the students are learning (Aamer, 2009; Abshire, 2006; AbuSeileek, 2007). English is not lingua franca but also the medium of official education in Pakistan and therefore pronunciation of English is very important here especially in academic & professional communication. This study is an experimentation into investigating the significance of CAPT on the pronunciation accuracy of Pakistani English language learners. This is a population (hence), which often faces distinct phonetic impediments linked with the linguistic characteristics of the first language, Urdu and other regional languages of the region (Ahmad et al., 2015). The efficacy of this method as a way of improving the English pronunciation of the learning population is investigated in this work, with the use of CAPT within the normal learning environment. The research also addresses a gap related to the interpretation and interpretation of results used to measure the effectiveness of CAPT based on rigorous research methodology juxtaposing pretest and post intervention evaluations to explore which components of pronunciation respond best to CAPT intervention (Ahmad et al. 2013).

In addition, the ability to quantify learner perceptions and the variation in phone competence as a result of the study is demonstrated. This approach is drawn upon in the study and in order to provide a contribution to the national discussion on language education in a multilingual context. The ultimate goal of this is to yield insight which can be used to subsequently refine instructional tactics and ultimately to be able to produce a more cost-effective manner of acquiring a language (Ahmad et al., 2013). Living in an interdependent and globalised society, and being able to communicate in English is becoming increasingly a valuable asset. However, a very big problem still is that of mastering English pronunciation for non-native speakers of the language (Ahmad, 2017). Not only that, Pakistani English Language Learners (PELLs) are even more true. The production of English sound and the articulation of English Language Learners (ELLs) may be improved by Computer assisted pronunciation Training (CAPT) which appears to be a possible method. The pursuit of accurate pronunciation in the process of learning a second language has emerged as a central priority in the field of language education, in particular with regard to the use

of technology-driven instructional strategies (Akram & Qureshi ,2012) (Akram & Mahmood , 2007)

2.2 New Trends in Pronunciation Pedagogies and 21st Century

Many problems were raised at the scene of the English as a Second Language (ESL) curriculum about the teaching and pedagogy of pronunciation. One example of Morley's interpretation is: There were issues about the significance of pronunciation as a focal point of education, questions concerning the possibility of teaching it directly at all, and questions concerning the premise that it could be learnt at all by direct instruction. The result was that an increasing number of programs decided to devote less and less effort and explicit attention to pronunciation, and a significant number of programs completely abandoned the practice (Morley, 1991). Furthermore, Jenkins (1998) claimed that the English language was exploited as an overpowering instructional medium of communication, which was one of the developmental alterations that occurred in relation to pronunciation. Next, there was a change away from believing in native-like accents and toward aiming intelligibility as a more practical and convenient objective for teachers of English to speakers of other languages (Hinkel, 2006). The needs, desires, and individual peculiarities of the learners became the primary components, and the active involvement of the learners was taken into consideration in the process of language acquisition (Morley, 1991). The pronunciation is currently being taught through the utilisation of a variety of methods, including the utilisation of activities that build fluency, exercises that focus on accuracy and draw attention to multisensory methods of pronunciation learning, the utilisation of authentic materials, and the adaptation of instructional technology in the teaching of pronunciation. Other areas, such as speech pathology, theatre, and psychology, also contributed new ideas to the study of speech pathology (Celce-Murcia et al., 2010).

2.3 Intelligibility and Comprehensibility

Instructions in the English language are provided at each and every educational institution in Pakistan. However, Pakistani students have always struggled with a significant amount of difficulty when it comes to verbal competence and command. According to Shahzada (2012), Pakistani English speakers have to deal with issues that are associated with their intelligibility and comprehensibility.

Intelligibility is defined as the capacity to comprehend both the speaker and the listener, and it is not only dependent on the performance of the listener. Comprehensibility, accent, and mutual intelligibility are the three factors that Levis (2005) identifies as being associated with pronunciation-related difficulties. According to Morley (1991), the primary objective of teaching pronunciation in whatever kind of instruction is not to achieve flawless competency but rather to teach accurate pronunciation. On top of that, Derwing et al., (2002) are of the view that the primary focus needs to be placed on intelligibility and comprehensibility rather than accurateness. According to Derwing and Munro (2015), when English is being learned as a second language, mutual intelligibility is a significant challenge that has to be addressed. In the field of human contact, intelligence is a fundamental need, and it has been used by a wide variety of professionals for a number of decades, including but not limited to telephone businesses, sound engineers, architects, speech language specialists, air traffic controllers, and many others (Levis, 2007).

2.4 CALL and Promotion of Learner Autonomy

The concept of "Learner Autonomy," which was conceived in the 1970s, is made possible by computer-assisted language learning (CALL), which allows the learner to become more and more autonomous while also providing him or her accountability for his or her own learning. Despite the fact that learner autonomy has been developing in a variety of language learning environments since the 1970s, this concept is not well understood in Pakistan (Bilal et al., 2013). The paradigm of education has moved from being focused on the teacher to being centred on the student, and then again from being learner centred to being learning oriented to being learning centric. The promotion of a learning-centred approach, as opposed to instructor-centred or learner-centred approaches, is the only objective of all educational endeavours that are now being undertaken all over the globe. On the other hand, this circumstance is in direct opposition to the Pakistani setting, since the teacher-centred technique, often known as spoon feeding, is prevalent in the majority of private schools and in all public institutions. Learners did not participate in any of the activities, and it was the teacher's responsibility to carry out all of the activities without any contribution from the learners. Nevertheless, in Bilidi's remark, there is a paradigm shift about the role of the learner (Baker & Murphy, 2011).

2.5 Learning Pronunciation through CAPT

CAPT has developed as a promising tool for the advancement of learners' pronunciation skills. This program provides learners with chances to practise and get concentrated feedback on their pronunciation. Many Studies have focused on the positive effect that technology-driven pronunciation training has on improving learners' phonetic accuracy and fluency. Nevertheless, in spite of the fact that the study that has been carried out up to this point has provided valuable insights, there is still a need for more in-depth studies that focus on specific linguistic groups, such as Pakistani English Language Learners (PELLs), in the area of CAPT efficacy. The purpose of this study is to determine the extent to which the CAPT can address the unique issues of this particular group of learners. Of course this does not mean that students from around the world aren't still placing a top priority on gaining fluency in the pronunciation of a language they do not have a native base for. It is when this is an area of language acquisition that this is the important contribution.. It is most true to students coming from many language backgrounds. When CAPT was introduced, there was a possibility for English language learners (ELLs) to use it to enhance their pronunciation. CAPT is an attractive option for developing pronunciation competence in that it offers the possibility for immediate and adaptive feedback, for customizable practice sessions. As far as ELLs' pronunciation accuracy improvement is concerned, the report stated that there has been growth in the amount of research that examines the effectiveness of CAPT materials in order to help ELLs' pronunciation accuracy across diverse linguistic backgrounds. Derwing and Munro (2015) and Lee and Sachdev (2020) have conducted studies on technology driven pronunciation training, which has demonstrated benefits of such a move to technology. Ali, Khan, and Rahman (2020) conducted a study which is the major contribution in the discipline because it provides insight into the distinctive situations of the Pakistani learners of English as a second language and their participation in CAPT.

2.6 Technological and Pedagogical Integration

Technological advancements such as more advanced feedback mechanisms and user interfaces have controlled the development of CAPT. This study aims to find out if CAPT interventions that cater to the linguistic needs of the PELLs are effective and did so by providing empirical evidence of the effectiveness of technology based

pronunciation training in a number of language learning contexts. English is not out of the sight, it is also one of the basic languages of Pakistan, that is why English is very much important to polish one's pronunciation skills so that communication skills could be outspoken in English. Several past studies have already discussed its usefulness in different language settings to identify its effectiveness. Garcia et al., (2020) studies indicate that technology aided pronunciation training is favourable to students' accuracy in pronunciation and intelligibility. Brown (2019), have also studied CAPT for the handling of specific phonetic challenges faced by English language learners from the minority whose first language is not English.

2.7 Importance of Pronunciation in Language Learning

The speech becomes intelligible with accurate pronunciation, a listener can understand the meaning behind speech easier than in the case of inaccurate pronunciation. The use of language in the academic and professional workplace, where verbal exchanges occur on a daily basis, whatever it may be, social, domestic or occupational, need to be clear and explicit. The pronunciation affects the impression that you are good at your language can have as big an impact as how it helps others to understand you. It's one thing that native speakers do, they see someone talking more fluently if those words are pronounced correctly. If a person happens to perceive that he/she is being spoken well, it can increase his/her confidence making him or her use it more and also be part of greater social interaction. Similar sound words help the learner to identify the different words that sound the same and therefore understand a conversation more efficiently.

This investigation centers on this specific learner group and dissects and analyzes the results produced by the use of CAPT in the context of the experimental design and methods used. The research provides insight into how such technology driven interventions in CAPT might be informative for solving the pronunciation problems that Pakistani English language learners face by systematically evaluating the impact of such interventions on pronunciation accuracy. In particular, the study reveals the limitations of CAPT in this regard. Moreover, the study conducted by Ali, Khan, and Rahman (2020) offers not only some new and interesting information that may have wider-ranging effects on educational language acquisition practices. Their work contributes to the increasing literature focused on the implementation of technology based interventions to promote more effective language teaching

approaches. Experimental data is analyzed and conclusions are made on the effect of CAPT on pronunciation accuracy. As such this study is a basic element in understanding the complex interactions between what we term technology, pedagogy, and the learning of the pronunciation skills by the English language learners, in the Pakistani environments. Pronunciation accuracy is significant while learning a language because it essentially determines how much English language learners will be able to communicate and understand. During recent years, computer-assisted pronunciation training (CAPT, for computer assisted pronunciation training) has been proposed as a new promising tool for the improvement of learners' pronunciation.

The aim of this experimental research is to investigate CAPT's impact on pronunciation accuracy of Pakistani English language learners given attention to its own inherent linguistic characteristics and challenges that apply specifically to this population. In addition to learning how to pronounce words and phrases correctly, when learning a language there was something you had to do. Not only does it make the communication more obvious for students to help them but it also helps students increase total language ability when they learn the language. More specifically, researchers find that for example, in the case of non-native English speakers the phonological systems of their mother tongue get in the way of mastering English pronunciation (Derwing & Munro, 2015). This is so because they have a different structure of the English phonological system compared to their native language. Perhaps the most common problems learners from Pakistan face when confronted with phonological distinctions between English and Urdu, Punjabi or other native languages are phonetic. Additionally, new technologies have been leveraged for processing the learning of a language. Recent examples of this trend include CAPT systems and ways and means of raising pronunciation interactively and on an individual basis. Usually, these systems provide students with (typical) implementations of these systems that provide students with access to real-time feedback, targeted exercise, and personalized learning paths. It creates practice of targeted and progress to the students. The effect of CAPT on English language learners of Pakistan, although this approach has been successful with some other language situations, had not been previously examined.

2.8 Theoretical Background

The CAPT program is composed of a variety of instructional methods and linguistic hypotheses. There is one of the most substantial theoretical grounds, Second language Acquisition (SLA) theories, where language acquisition is related to cognitive process and ability of producing this language is obtained through exposure, practice and feedback. Contrastive Analysis Theory (CAT) that differentiates similarities and contrasts of L1 compared to L2. Pakistani English Language Learners (ELLs) identify and resolve the phonetic and phonological distinctions between English and their home languages of Urdu or Punjabi. Seeing as this is what CAPT programs do, they focus on specific phonetic factors which have traditionally been trouble spots for learners, and in order to improve the learner's accuracy in this area, the program utilizes activities based on those discrepancies. The aim of this research was to discuss ways in which ELLs with a particular linguistic background e.g. Pakistani ELLs learn and improve their pronunciation in a second language, English. The theories such as the Speech Learning Model or the Perceptual Assimilation Model. These models explain how students perceive and internalise new sounds and phonetic contrasts in English, particularly when the English phonological system is different from the students' native phonological system. The CALL (Computer-Assisted Language Learning) methodology provides advantages that technology provides in order to improve language acquisition, in particular, the teaching of pronunciation. The theoretical foundations contain concepts from the Interaction Hypothesis, which focuses on how interacting with technology might help with language acquisition. In addition, the research included perspectives on theories of learner autonomy and motivation. The study examines the effect of CAPT on learners' motivation, self-efficacy, and autonomy for the practice of pronunciation in settings other than purely traditional classrooms. For instance, the Self-Determination Theory highlights how the integration of technology improves the intrinsic motivation of learners by allowing for more autonomy, competence, and relatedness in their learning process.

This research may draw its theoretical background from SLA theories, Contrastive Analysis, Speech Perception Theory, Input Hypothesis and Sociocultural Theory also TPACK theoretical framework in order to determine how CAPT intervention influences the pronunciation accuracy of Pakistani ELLs.

TPACK

In this research the TPACK theoretical framework has been used in order to see the impact of CAPT on pronunciation. Technology Pedagogical Content Knowledge (TPACK) is a theoretical framework designed by Mishra and Koehler (2006). It was introduced to facilitate teachers to teach effectively with use of technology. For the field of CALL, TPACK theory is especially useful since it guides educators toward the development of pedagogical CALL y-sound, technology-enhanced language learning activities. Teachers of content area language learning CALL require not just expert knowledge of language teaching and learning theory and their subject matter, but also a thorough grasp of the technological tools at their disposal.

Effective technology integration requires three categories of knowledge, as described by the TPACK framework and these are as under:

1. The teacher's familiarity with various forms of technology and their use in the classroom is what is meant by "technological knowledge." In the context of CALL/CAPT, this might include becoming familiar with various pieces of language-learning software, as well as other online tools and resources.
2. Knowledge of the linguistic system, vocabulary, and discourse of the subject matter being taught are all examples of what is meant by "content knowledge" for a teacher. This might include understanding how to use technology to improve various linguistic abilities (such as reading, writing, listening, and speaking) within the framework of CALL
3. CAPT Teachers who have a firm grasp of these three areas of knowledge are better equipped to create and execute technological CAPT enhanced language learning activities that are based on solid pedagogical principles. By using technology in this manner, educators may provide children with novel opportunities to practise and improve their language skills.

2.9 Previous Studies on CAPT and Pronunciation

According to research conducted in the area of second language acquisition (Derwing & Munro, 2015), accurate pronunciation is one of the most important factors in determining one's level of communicative competence. Learners of English

who come from environments in which English is not spoken as a first language, such as learners from Pakistan, sometimes struggle with pronunciation despite the fact that accurate pronunciation is an essential component of language fluency (Levis, 2005). Usually, to get going, one might look into the theoretical background which may involve things like how students learn a second language and how students learn to pronounce. For example, by considering the work that John Archibald undertook on speech learning models (specifically, the Perceptual Assimilation Model, PAM) provided insights into how second language learners process and understand the sounds of the language they are learning. Furthermore, the crucial period hypothesis and its suggestions for pronunciation acquisition by adult language learners can be well understood with models such as Flege (1995) Speech Acquisition Model. It is, therefore, essential to review research that explores the effectiveness of technology based pronunciation training programs and determine whether CAPT is really efficient. Perspectives on the effectiveness of CAPT for improving pronunciation accuracy could be derived from research that focused on the effectiveness of computer assisted pronunciation training systems conducted by Levis' (2007) work on the pedagogical implications of using technology in pronunciation instruction.

Subsequently, when researching Pakistani students of English language it is important to research the topics that are relevant for this population. Although it is possible, Sarwar & Safdar (2016) research on challenges and errors made by Pakistani learners of English in pronunciation, and Khan research on effectiveness of pronunciation teaching methodologies in Pakistan may be useful to understand the specific needs and challenges of this learner group particularly. The full study by Sarwar and Safdar can be found here. Moreover, the social factors impacting on pronunciation acquisition should also be considered useful for Pakistani learners of pronunciation. With an understanding of social variables, cultural origins, and the linguistic identities of these learners through the help of sociolinguistics theories put by researchers such as (Bourdieu, 1991) it is possible to use these variables to deal with learners whose speech undergoes acquisition. Recently the Computer Assisted Pronunciation Training (CAPT) program has arisen as a potentially valuable resource in language instruction. The integration of technology and language pedagogy (also provided by CAPT) offers learners possibilities for instruction that is interactive and personalised (Neri et al., 2002). CAPT has been found to offer students rapid

feedback, focused practice, and individualised learning experiences (studies have shown). Even so, it is not very significant in what extent it is beneficial that differs greatly with respect to the environment and the demographic of the students who are being taught (Chun , 2017) but with the specific context of English language learners in Pakistan, the analysis brings in a new and interesting facet.

The study conducted by (Johnson et al., 2019) has also shown the results of using CAPT in the context of improving learners' phonetic output, and overall pronunciation in a wide range of linguistic environments. Nevertheless, this particular effect of CAPT on English Language Learners (ELLs) from Pakistan remains an under exploited area of research. When the setting of English as a second language in Pakistan, where pronunciation of English has always been problematic, is considered, investigation of the effects of CAPT becomes yet more important. According to Ahmad (2017) Pakistani English learners have a high frequency of pronunciation problems. The reason behind these challenges is linguistic differences, but also lack of interaction with native English speakers. For this reason, it is very essential to find out how CAPT treatment might possibly be capable of solving these problems and hence lead to enhancement of overall Pakistani students' oral communication abilities. Furthermore, there are many cultural and environmental factors that will affect the effectiveness of language acquisition treatments. Rahman (2019) research demonstrated the significance of considering sociocultural aspects while fashioning and executing language education system programs in Pakistan. This experimental research attempts to discern how CAPT influences Pakistani ELLs' pronunciation accuracy compared to their linguistic origins, cultural settings and their past exposure to English language learning methodologies. The above mentioned framework serves as the context in the study. The goal of this research is to provide empirical data on how effective CAPT is for improving the pronunciation of Pakistani who are English Language Learners (ELLs). This will be done through controlled trials, and through the use of qualitative as well as quantitative assessment tools. This thesis intends to make a contribution to greater understanding of the effectiveness of CAPT but also offers unique insights and possible adaptations for the Pakistani context. With success, this can be applied for pedagogical practice in English language education within the area.

According to Ellis (2019), it is claimed in the theoretical foundations of SLA that learners attain their language skills when exposed to focused information from exposure, combined with practice and feedback. These concepts are in the same line as CAPT because it provides students with targeted instruction, instant feedback and repeated practice of the pronunciation skills that can let students easier master the skills to pronounce 'accurately' (Levy, 1997). Besides, research in SLA identifies the role played by corrective feedback in language acquisition and shows that the proper and timely feedback which CAPT can provide to learners could help them in detecting the errors in their pronunciation and correcting it.. The reason for this is that CAPT can provide feedback on many phonological features. Moreover, the Technology-Enhanced Language Learning (TELL) framework serves as a perspective of how the technology may be used in language education. The field of CAPT (Stockwell, 2012) is included in TELL and is centered on the use of technology resources to aid language learning processes. TELL theories advocate, explains Chapelle (2003), for the efficient inclusion of technology in ways that enhance the built learning environment while responding to the specific needs and preferences of the learner.

Thus, the TELL principles are consistent with the customisable CAPT features and flexibility which may allow for the CAPT to deliver individualized pronunciation instruction to Pakistani English language learners. Research into the effectiveness of CAPT in each of these areas has been conducted through a number of empirical researches. This underscores the need for future research on this topic. Research in the field of language acquisition has an interest in whether or not Computer Assisted Pronunciation Training (CAPT) will have an effect on improving pronunciation accuracy in English Language Learners. Computer Assisted Pronunciation Training (CAPT) method is an approach which makes the learners' pronunciation abilities more effective by utilizing various computer applications and feedback systems and focused exercises. Previous research (Levis, 2007) demonstrated that it has, potentially, the ability to enhance students' pronunciation abilities through the provision of feedback and guidance. However, there is still more research needed to determine if CAPT will work for English Language Learners (ELLs) in Pakistan. Research (Derwing & Munro, 2015) conducted on second language learning in the

area has repeatedly underscored the importance of good pronunciation in both communication and understanding.

Pakistani English Language Learners might find it especially challenging to understand correct pronunciation because their home language phonology is so dissimilar to that of the English language. For this reason, research into the effects of CAPT applied to this particular population could provide a very useful insight into the usefulness of CAPT in targeting the pronunciation aspect of Pakistani English language learners' difficulties. Research of CAPT treatments for pronunciation are beginning to show some intriguing findings across certain contexts, including (but not exceptional to) improvement in segmental correctness, stress patterns, intonation. These results demonstrate how CAPT can provide personalized feedback and practice to learners, important in bettering their pronunciation (Burston, 2014). For this reason, experimental investigations into the use of the program within the Pakistani ELL environment, while considering the specific language problems and learning preferences of the group must be conducted in order to empirically validate (adaptability and efficacy) of the program within the Pakistani ELL environment. An experimental study of Pakistani ELLs would not only contribute to the broader body of research on CAPT but also have practical implications for teachers and creators of language learning technologies. Implications for CAPT are drawn regarding how to improve pronunciation accuracy for this particular learner population to promote the design of more focused and competent instructional materials, and therefore enable more effective language learning for Pakistani English Language Learners. The Comprehensive Academic Performance Test is CAPT. Derwing and Munro (2015) outlines their research into pronunciation being an important aspect in both communication and the receiving of a message. To understand and be understood in English you will need to have a clear, correct pronunciation in English as a second language.

This shows that CAPT programs could provide the learners with fast feedback and directed practice, which potentially would enhance the correctness of the pronunciation made by the learners. It should also have the theoretical basis, such as discussing the purpose of conducting experimental investigation to check whether CAPT has been successful in enhancing pronunciation accuracy. Derwing, et al., (2002) also discussed issues around research methodology and in discussing

pronunciation interventions place a strong emphasis on the need to use controlled experimental designs to establish the influence that interventions have on pronunciation improvement. The acquisition of a second language, or SLA, is a field of study which stresses pronunciation as a means of achieving communicative competence. The need for pronunciation in comprehensibility is stressed by Derwing and Munro (2005) and that pronunciation training leads to favourable effects on the total language competence of the person. According to these scholars, effective pronunciation training is the basis for successful learning of all second languages.

Flege (1995) also mentions the important critical period hypothesis, stating that with focused instruction learners can be made to have a pronunciation like that of native speakers when they learn a language during the formative years. Drawing on studies of Hubbard (2008) and Stockwell (2012), the potential of Computer-Assisted Language Learning (CALL) technologies in supporting the development of appropriate pronunciation within language learning enabled by technological advancements is emphasized. . Moreover, Kachru (1992) hypothesized what cultural and linguistic elements would, in fact, heavily shape the evolution of World Englishes. Because of the impact of the phonology of the native language, and other sociolinguistics issues, learners of English in Pakistan have specific difficulties. Findings of Jenkins (2000) English as a Lingua Franca (ELF) indicates that students of the language should be concerned with intelligibility, not pronunciation that sounds like their native speakers. That's because English is spoken everywhere. On the basis of these theoretical foundations, experimental research will be conducted to examine whether or not CAPT is successful in raising pronunciation accuracy among Pakistani English Language Learners. To investigate the influence of the software on the learners' pronunciation accuracy, research will be made through controlled experiments, customised CAPT software, and pretest and post-tests. The feedback mechanisms and qualitative analysis will also be used to answer the research.

Computer assisted pronunciation training (CAPT) and its impact on pronunciation accuracy among English language learners have sparked substantial interest in second language acquisition. It has been studied with respect to the impact of CAPT on English word pronunciation accuracy. The second method—the CAPT—is a forward thinking approach that utilizes technology to teach students how to pronounce English better. Much work in this field utilises theoretical frameworks,

including Flege's (1995) Speech Learning Model (SLM) which assumes that age and exposure interact in the development of native-like pronunciation. Flege's Model based findings suggest that with age learners become less and less able to approximate target-like pronunciation. This is why any intervention that can be provided upfront (as done by CAPT) enables more accurate pronunciation of words. Derwing and Munro (2009) show how difficult it is for the adult learner to achieve a pronunciation level as close to the native speaker level as possible and recommend treatments, such as CAPT, to overcome problems relating to pronunciation. Further, studies have been carried out to find out whether or not CAPT is effective, and the results are contradictory.

More studies need to be done on the direct influence of CAPT on the pronunciation correction in Pakistani English language learners. Based on Pakistani learners' research (Mansoor, 2005), difficulties in the learning of English pronunciation have been identified due to the phonological landscape of the learner's first language. The results point out the necessity of investigating the effectiveness of CAPT treatments that are tailored to particular needs of Pakistani learners. The purpose of this inquiry is to conduct an experimental investigation into the effect of CAPT on pronunciation accuracy of Pakistani ESL learners to contribute to responding to such a gap in the scholarly literature. Overall, based on the theoretical foundations supporting CAPT's effect on pronunciation accuracy, intervention needs to happen in a timely fashion, individual learner characteristics need to be considered, and context specific research is needed. Although the available studies give some insight into what the advantages of CAPT might be, much more research is needed to better understand the effectiveness of CAPT in helping students improve pronunciation ability, especially with Pakistani English language learners.

2.10 Language Learning Context in Pakistan

Pakistan is a country with a numerous language acquisition context, which is getting affected by a large number of variables including socioeconomic background of people, educational background, culture and many more (Shamim, 2011). Since English is a second official language in Pakistan this language has a larger implication as compared to the past as this language is used in educational institutions, commercial settings, instructive organization and administrative settings (Rahman, 2002). The learners in Pakistan are exposed to English in various contexts: through

their officially sanctioned schooling, from the media, and from cross cultural influences (Mansoor, 2004). As a result, language acquisition takes place in an often complex environment. However, although a large number of Pakistanis speak English, a number of Pakistani students of the English language still require help in pronouncing words correctly. In Pakistan, the environment in which one acquires a language is rich in variety and layered in complexity. A variety of historical, sociological, and educational variables shape this environment (Rahman, 2005).

The study of English, which is categorised as a second language, is accorded a substantial amount of significance in the fields of academia, the workforce, and society at large (Shamim, 2011). In spite of the fact that this country was formerly a British colony, there is a great deal of diversity in both the level of English ability and the way English is used in different areas and socioeconomic classes (Mahmood & Ghani 2012). The primary language of teaching in the educational system is English; however, regional languages such as Urdu and regional dialects are emphasised in schools run by the government (Rahman, 1997). Private schools employ English as their primary medium of instruction. This contradiction gives rise to a linguistic gap, which in turn has an effect on the level of English language competency among students (Shamim, 2011). The introduction of new technologies for computer-assisted pronunciation training (CAPT) in recent years has piqued the interest of students of English as a second language in Pakistan (Ahmad & Rao, 2012). These technology advancements seek to enhance people's ability to say the words correctly using interactive learning experiences personalized to a user's needs. The experiment on the influence of CAPT on the pronunciation of Pakistani English language learners was conducted in research.

The research was performed by using controlled experimental methodology and correctness of the participants' pronunciation was measured before and after they used CAPT technology (Khan, 2019). The study results indicated positive effects as evidenced by the huge gap between the ability of participants to pronounce after the CAPT intervention by Khan (2019)

Among various factors, a customised feedback, interactive activities and an option for the self practice helped CAPT to succeed in Pronunciation Accuracy (Ali & Rehman 2017). Statistics research has proved that, with addition of technological based solutions (CAPT) in the learning curriculum in English language in Pakistan,

learner's pronunciation problem can be resolved (Nadeem et al., 2012). But encouraging that the research also proved to have its limitations and concerns. However, there is still a problem with access technology and its dependent, reliable internet access in general but more so in rural and deprived areas of Pakistan (Hassan, 2014). Additionally, if the variety in the cultural and linguistic aspects which is to be found throughout the entire nation, then one requires a complicated approach to instructing pronunciation that caters to local variations and accents (Ahmed; 2017). The languages spoken by the population of Pakistan are innumerable hence Pakistan has a number of issues about its English language education system (Kausar et al., 2021).

The main aim of the program is to resolve pronunciation problems that learners have in learning pronunciation. Furthermore, given the experimental nature of this research, CAPT's effects will be measured in controlled environments with certain parameters measured with a broad base of metrics. However, a group of Pakistani students of English language are expected to go into the interactive environment of CAPT modules while a group will study the Guide with traditional methods. This allows for comparison between these two groups and then to assess the extent to which CAPT increases the pronunciation accuracy of Pakistani language students. This has an important contribution to the knowledge of language acquisition in Pakistan wherein the possible effectiveness of technological techniques like CAPT is given light, in resolving pronunciation issues. Given this finding, educators, curriculum developers and policy makers in Pakistan involved in the process of English language education for the country, need to appreciate its significance by adapting to individualized instructional approaches that foster learners' pronunciation abilities. The utilization of CAPT under the reign of Pakistan's educational system intrigued by the possibility of certain aspects in the system being improved and by new ideas.

The CAPT combines technology with the traditional language study methods in order to improve the pronunciation abilities of its students. The objective of this experimental study is to identify how CAPT affects pronunciation accuracy of Pakistani students learning English as the second language. This study aims to determine the extent to which this novel strategy can alleviate those problems which English language students have with acquiring authentic English pronunciation. The

study is particularly important due to the one-of-a-kind linguistic environment that results from the many regional languages and dialects interacting in the country, which makes the study focus on Pakistani students learning English particularly relevant. Secondly, they find it difficult to pronounce English because of their home languages that create different speech patterns and speech intonation, making it almost impossible for them to master the sounds and intonation of the English language. This research aims to find out whether or not CAPT can fill in these language gaps and enhance learners' pronunciation accuracy within this particular cultural, linguistic context. Using experimental approaches and rigorous analysis, this research aims at significant insights into the usefulness of CAPT as a pronunciation accuracy enhancement technique among Pakistani English language learners. This exploration not only adds to the pedagogical techniques within Pakistan but forms wider relevance to language learning techniques in a range of multilingual environments worldwide.

2.11 Research Gap

Although there has been rising interest in CAPT interventions designed to improve the accuracy of pronunciation, it is evident that there have been gaps in research on how effective such an intervention might be for younger students, such as 5th-grade Pakistani English language learners.

However, there has been growing interest in increasing the accuracy of pronunciation for CAPT intervention, although for the younger students such as 5th grade Pakistani English language learners is an area where research seems to have gaps about how effective the intervention can be. Many studies focused on adults or older learners neglect the special needs of development, cognition, and linguistics present in younger students whose phonological awareness is still in the developing stages. Further, the specific difficulties that the 5th-grade Pakistani learners would likely encounter-for example, the complete absence of native English sounds-are not discussed at length in CAPT. There are hardly any research studies showing how effective CAPT is in communicating authentic, relevant feedback to children and how it adjusts its instructions for the developmentally differential learning pace. Accordingly, an experimental study is in need to be conducted as an attempt to explore and assess the use of CAPT with respect to pronunciation accuracy enhancement in 5th grade Pakistani students. The researchers also have to consult and

analyse how this technology helps in improving based on pronunciation accuracy for this age group more generally. To the best of researchers knowledge perhaps no study of this nature has been conducted in Southern Punjab at Primary level focussing on learners's pronunciation.

2.12 Conclusion

This chapter highlights the fundamental significance of pronunciation in language acquisition. It presents CAPT as a cutting-edge strategy made feasible by technical developments, intended to improve learners' pronunciation. An analysis of some contemporary developments in teaching pronunciation reveals a trend toward learner centered approaches and that use of digital material. The fact that CAPT is an important development in the discipline that offers interactive activities and focused feedback to promote the comprehensibility and intelligibility of language learning, is highlighted in this chapter. Through the capability of using technology to improve and enhance learning and teaching outcomes, and through enabling learners learning or teaching pronunciation to independently improve pronunciation themselves using digital materials available, CAPT allows technology to develop learner autonomy. In addition, important aspects of CAPT that provides an interactive exercise for targeting specific pronunciation problems, visual aids and automatic feedback system. With this larger context of educational philosophy as background, this thesis examines a part of this technology integration.

Review makes a point of looking at how important pronunciation is to language learning and using the term pronunciation as a part and parcel of language competence. The theoretical framework part explains how CAPT influences pronunciation and influences learning outcomes. In particular, it looks at the issues of, and the opportunity for, the case in Pakistan — a country with several languages and multiple education environments.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents research methodological perspectives adopted in this research study. It defines population/samples as well as its research instruments and procedure of data collection and data analysis of collected data.

A pretest and post-test design was used for this experimental investigation. A pretest was taken that collected baseline data before the beginning of the CAPT intervention. The purpose of this exam was to test the participants' initial pronunciation accuracy. This preliminary evaluation was performed to serve as a comparative mechanism for analyzing differences or improvements resulting from the intervention. Similarly, the methodology part would have gone into the exact metrics or criteria stacked up to view the accuracy in the pronunciation. A complete description of rubrics, scales, or linguistic characteristics may have been given for participants to correctly quantify their changes in pronunciation.

This chapter also deals with some relevant factors like ethical concerns, obtaining informed permission from participants and taking steps to ensure confidentiality. This chapter presents a comprehensive overview of the complete structured approach adopted to investigate the CAPT impact on the pronunciation accuracy of English language learners from Pakistan. The procedures, tools, and participant selection along with ethical considerations for the experimental design have also been discussed.

3.2 Type of Research

This research is quantitative. Through an empirical methodology, quantitative research gathers and analyses numerical data of a systematic nature to explore specific phenomena, relationships, or patterns (Creswell, 2014). The systematic approach to get numerical data is done through surveys, experiments or observations so that scientists are able to measure the variables and their effects (Babbie, 2010). After obtaining data through this process, statistics analysis methods are utilized in order to find patterns, correlations, or associations results that help understand the underlying research questions or hypotheses being stated (Punch, 2013). Quantitative research

aims for objectivity and replication in data collection and analysis by reducing subjectivity or bias in the data collection and analysis (to do so common standardised procedures and measurement instruments are frequently used). Quantitative research attempts to extend the summary conclusions derived from a sample to the population as a whole via statistical inference and hypothesis testing (Shadish et al., 1986). Not only has it helped advance knowledge in key areas across all the main disciplines (psychology, sociology, economics, etc.), it is amply contributing to the most recent concerns in the natural sciences.

3.3 Research Design

In this study, a research approach was presented using a quasi-experimental design to determine the impact of CAPT on pronunciation accuracy of Pakistani students learning English as a second language.

The quasi experimental research designs that do not employ random selection of participants and are used in real world applicability to study the impact of some interventions in realistic settings (Cook & Campbell, 1969). Previous research studies using quasi-experimental designs have shown positive impact in evaluating educational interventions and teaching methodologies (Shadish et al., 1986). Jalali & Dousti (2014) utilized a quasi – experimental research design to analyze the effect of different instructional strategies on the pronunciation skills of learners of English as a Foreign Language (EFL) in Iran. This research study found that learners who underwent computer assisted pronunciation training improved their pronunciation compared to those taught through the conventional methods. Consistent with prior studies, the present study used a non-equivalent group pretest and post-test quasi-experimental data collection method to measure the effectiveness of the CAPT for English language learners from Pakistan. In order to increase the internal validity of the findings, the participants in the experimental group and control group were selected from the same school and same class.

A quasi-experimental design is different from a true experimental design, as participants are not randomly selected in a quasi-experimental design. Quasi-experimental design involves real-world intervention, and they have higher external validity. The researcher used a non-equivalent group pretest and post-test quasi-experimental research design because the study included an experimental group and a

control group. The groups were as similar as possible because the researcher selected both groups from the same school, which had the same class and textbooks. It helped control confounding variables that can influence cause and effect. Only the treatment of the experimental group differed from that of the control group. The control group was taught by traditional method, and the experimental group was taught using the CAPT program.

Table 1: Types of Experimental Research.

Types of experiments	Random	Non-random	Pre test	Post test	Type group
True experiments	✓	×	✓	✓	✓
Quasi experiments	×	✓	✓	✓	✓
Pre-experiment	×	✓	✓	✓	One group

3.4 Population and Sample

The population of this study consists of 5th-grade students from both private and public schools in Pakistan. The sample includes 50 students (23 males and 27 females) from the 5th grade. The participants were from two preexisting groups, Group A and Group B, each comprising 25 students. Their ages range between 10 and 12 years. Most participants were born in Multan and shared a similar sociocultural background. Notably, almost all students had been enrolled at Falconhouse Grammar School since kindergarten, reflecting a continuous and consistent educational experience. This demographic homogeneity minimised potential confounding variables, enhancing the reliability and consistency of the study's findings.

The data utilized in the present study was collected through Purposive sampling. Purposive sampling, also called Judgemental or selective sampling, is a non-random sampling technique widely used in scientific research (Johnson &

Christensen ,2013). This intentional methodology ensures that the achieved sample evidence has the special attributes or quality for the research.

Researchers frequently employ purposive sampling to examine a specific population with distinctive characteristics or experiences. Moreover, this sampling method is preferred by researchers attempting to accomplish particular aims or objectives. Researchers can enhance the relevance and validity of their study by intentionally selecting participants according to predetermined criteria (Maxwell, 2013). This allows them to mould the sample to suit their particular requirements. Puranama (2019) used purposive sampling in a quasi experimental research on the application of tongue twister to improve students' pronunciation.

Purposive sampling is widely used by researchers to examine a particular population with distinctive characteristics or experiences. In particular, this sampling method is adopted by researchers who try to achieve specific goals or objectives; researchers can further increase validity of the study by consciously choosing the participants matching predetermined criteria (Maxwell, 2013). It allows them to shape the sample as required by them. Puranama (2019) in a quasi experimental research study on the application of tongue twisters to improve students' pronunciation also used purposive sampling technique.

3.5 Teaching plan (Treatment plan)

The researcher made sure both groups experienced similar circumstances. The researcher taught both classes. The pronunciation materials were taken from the 5th grade English textbook. The instruction consisted of 45 days and 5 lectures a week each lasting 35 min. The researcher used 'Cambridge Online Dictionary' in the CAPT technique to teach an experimental group, while the control group was taught by adopting the traditional teaching method.

3.5.1 Cambridge Online Dictionary as CAPT Intervention

Cambridge online dictionary was used to teach experimental group through CAPT technique.

The Cambridge University Press published the Cambridge Online Dictionary which is an online resource aimed specifically at anyone learning and using the English language across the globe. Dictionaries offered are very diverse covering

various demands like the Cambridge Advanced Learner's Dictionary and Cambridge Learner's Dictionary. Each one of these dictionaries provides the exact definitions, explanatory examples, British and American English pronunciation guidance and interactive features such as quizzes and word lists. In addition, the Cambridge Dictionary +Plus application optimizes learning by giving custom word lists and an amazing exercise to permit vocabulary to be learnt effectively.



Figure 1: Image of Cambridge Online Dictionary



Figure 2: Image of Cambridge Online Dictionary

3.6 Data Collection Instruments

3.6.1 Pre-Test

Pretest was taken from groups A and B before the first lesson of teaching pronunciation. The Pretest was made to evaluate their initial level of accuracy of pronunciation before exposure to CAPT training.

3.6.2 Post-test

At the end of the specified time in the intervention of the CAPT, the participants were given a post-test. The post-test was in the same form as the pretest,

and offered the opportunity to compare the participants' performance in terms of their pronunciation accuracy in the early stage of the study and at the end of the study after participating in the CAPT program. The extent to which CAPT intervention influenced participants' pronunciation accuracy is found in the difference between pretest and post test results.

A Post-test was taken after the teaching plan of six weeks. The English pronunciation of A and B groups was evaluated via the Post-test. The post-test was designed to determine whether students had improved in pronunciation after use of the Cambridge Online dictionary in CAPT.

3.6.3 Research Variables

This present research study has two variables: an independent variable and a dependent variable. The teaching pronunciation through the CAPT program was an independent variable, and the improvement in students' pronunciation skills was a dependent variable.

3.7 Data Analysis

A systematic approach was used in this research study, and the SPSS software program was used for pretest and post-test analyses. This made it possible to provide a full breakdown of participants' language competence levels before intervention and after.

Initially participants went through a pretest evaluation before having access to perform the CAPT program. The researcher collected baseline data to examine their initial pronunciation accuracy and what their level of pronunciation in the English language was before starting the first lesson. After the intervention, the researcher organised and analysed the data using SPSS, which helped to perceive the basic understanding, which participants in starting position had in regard to knowledge and pronunciation proficiency.

After the pre test phase, the treatment presented to the participants as CAPT was utilized. This phase framework also included interactive sessions of the computer assisted program with focused pronunciation exercises involved in the program. At the end of CAPT sessions, a post-test evaluation was taken by both groups. The

participants were tested again to ascertain the influence of the intervention on their levels of accuracy of pronunciation.

The data collected through posttest was analysed using SPSS and compared with the original pretest findings. The most helpful tools in aid of determining the importance of any changes in the participants' pronunciation accuracy after the CAPT intervention were statistical tests and studies inside the SPSS. Not only does this all encompassing approach make it easier to detect any noticeable changes or improvements in the participants' ability to pronounce words accurately, but it also provides significant insights as to the effectiveness of CAPT in helping Pakistani English language learners to pronounce words accurately. The students then participate in a Computer Assisted Pronunciation Training (CAPT) program and train to pronounce words more accurately.

These assessments were conducted, in order to determine whether the CAPT program had a significant impact on the accurate pronunciation of foreign words by Pakistani English language learners. Results of the statistical evaluations of the intervention were able to prove advances or improvements in the level of pronunciation from the pretest to the post-test evaluations.

This research technique was proven to enable the researcher to objectively quantify and analyze the effect CAPT program has on Pakistani English language learners' pronunciation accuracy. This was possible because SPSS was used in this study.

3.8 Reliability and Validity

SPSS was applied in evaluation of the essential features of validity and reliability which were needed in a study design that incorporated a pretest and a post test. The research was legitimate in that it was determined by taking painstaking steps to ensure that the research was accurate and appropriate to measure what it was intended to measure. Selection of acceptable instruments and methodologies during the pretest phase at the start of the study was done very carefully, to confirm how accurately the participants were able to pronounce at the start of the study. In order to test the language abilities called for, the instruments were chosen to rank the skills as per the desired language abilities, this was essential to ensure that the instruments used for analysis rank the language abilities as desired without bias.

During the same time while working on the implementation of the framework, significant importance was given to reliability to ensure that results are reliable and consistent. SPSS significantly determined the effect on dedication of all the research instruments that were used on the pretest and post test assessment. SPSS was used for statistical analysis for the selection of internal consistency of instrument of assessment used in different phases of research. The researcher could find the stability and consistency of the measurements of the condition through the use of methodologies such as test-retest reliability. In addition, it provided assurance that the observed changes in pronunciation accuracy were due to the intervention CAPT, and not to measurement error.

In this research, SPSS could be used for pretest and posttest to ascertain the detailed knowledge of CAPT influence on Pakistani English pronunciation accuracy for Pakistani English language learners. The reliability of the data acquired was also confirmed to SPSS, to help the statistical analyses. It made the participants feel capable of determining that CAPT enhanced their pronunciation accuracy.

3.9 Ethical Considerations

The ethical issues were considered all through the complete research procedure. At first, everyone needed informed permission. Contained an explanation of the purpose of the study, the methods to be used, and benefits, such that participants knew just what participation in this research entailed. Privacy was given great control. Securely it was stored to prevent unauthorised access to all personally identifiable information collected from the participants. Data anonymization and secure storage of the participants was performed during all phases of the study.

One of the most important ethical considerations was respecting participant's autonomy. This research had to encourage them to participate as free participants, not compel them to participate. Additionally, the instructional plan was performed in a respectful and helpful manner to the research participants. Their comfort and well being were always considered during the CAPT program. They did all the way through the process. In SPSS study that has done confidentiality of data has been done too carefully.

In addition, the plan was carried out in a kind and honorable manner to the research participants. Throughout the CAPT program, their comfort and well being

were constantly in mind. They did it all the way through the process. During the study using SPSS, the data was taken with care and confidentiality.

3.10 Research procedure

The research started with the pretest taken from each group to examine their initial pronunciation accuracy level. The pretest word list is carefully extracted from the Oxford Progressive English book which is designed for 5th grade students. Ten words were chosen from the first 5 units of the book for pretest and post-test. The Researcher allocated every word a value of 10 marks, so the test was 150 marks total. The assessment process included individual tests, in which all 50 students took individual tests in which the researcher systematically presented each specific word and wrote down each time the student pronounced that particular word. Anyone who enunciated flawlessly scored a ten and anyone who didn't pronounce accurately got a zero score. Following that, the researcher collected and analysed the pretest results of each student, which then became the basis of further intervention.

Following the initial examination, the experimental phase started which aimed at delivering a structured Computer-Assisted Pronunciation Training (CAPT) program that systematically enhanced pronunciation accuracy. This programme included various features like interactive modules, audiovisual aids and specific exercises which cater to specific pronunciation weakness that has been identified during the pre-test phase. The instruction using CAPT technology as a resource (such as Cambridge Online dictionary) was given to the experimental group. Ten specifically chosen words were presented over a duration of 40 minutes per instructional session. All sessions were performed by the researcher using the researcher's own personal laptop that had a speaker to make sure that audio was delivered as precisely as possible for all participants and the Cambridge Online dictionary. Learning is active in the sense that the students listen attentively to and repeat words that are presented to them. That made this interactive pronunciation method not just easier for students to practise, but also improved their vocabulary since it supported a better understanding of the meaning of the words in its context.

Once the researcher had students listen and repeat, she promptly assessed whether the students had made a correct pronunciation of the word. Each student was then individually prompted to say the words, and the researcher recorded and

evaluated their pronunciation, and compared it to the app's feedback. It forced this iterative process on to give focused intervention and customised feedback to tackle an individual's pronunciation difficulties. The control group, or the non-experimental group, received a period of six weeks without significant treatment interventions and was taught using traditional teaching methods after the initial pretest phase. The experimental group, on the other hand, experienced systematic instruction in pronunciation with the Computer Assisted Pronunciation Training (CAPT) programme where modules, audiovisual aids and personalised exercises were intended for specific pronunciation accuracy.

Both groups were given a post-test after the six-week treatment plan ended to evaluate the effectiveness of the intervention. Fifteen words were selected from the following three Oxford Progressive English book units in the post-test. The post test score was therefore made up of 150 marks: 10 marks for each word.

This methodology allowed for a direct comparison of pronunciation accuracy between the experimental and control groups, and the effect of the CAPT intervention on pronunciation accuracy was evaluated on this basis. By (1) implementing the exact same assessment parameters and word selection criterion for both the pretest and post-test phases and (2) maintaining consistency and reliability in measuring the treatment plan outcomes, the study allowed for measuring of treatment plan outcomes. To get a baseline on the CAPT programme effectiveness, an inclusion of a control group that had not completed the programme was included. In order to determine the impact of the CAPT intervention on improving pronunciation skills for ESL learners, the specific impact of the CAPT intervention on pronunciation skills for ESL learners were compared to those of traditional instructional methods in the control group.

In particular, this study aimed at determining whether the Computer-Assisted Pronunciation Training (CAPT) program improved these English language learners' (ELLs') accuracy of pronunciation. A well planned research methodology was utilized in order to accomplish this objective, that included a pretest and post-test methodology. The intentional choice of Pakistani English language learners who desired to improve their pronunciation ability were chosen with great care and systematized, starting with this method. Pretest and post-test design was employed to measure the influence of CAPT on the accuracy of participant's pronunciation. This method of systematizing practice enabled us to spot obvious improvements or

changes in the ability to pronounce words accurately, and greatly boosts the language learning and language teaching methods.

3.11 Summary

This quantitative research study investigates the impact CAPT on pronunciation accuracy of Pakistani students who are second language learners of English. The quasi experimental design study is conducted on 50 fifth grade students involving 23 males and 27 females of Falcon House School, Multan Pakistan. Each group consists of 25 students of similar age between 10 and 12 years and belong to Group A and Group B respectively.

The purposive sampling technique was used in this research study. Participants of both groups were subjected to similar conditions, the researcher taught both classes. The pronunciation materials were taken from the English textbook of the fifth grade. This study evaluated the effectiveness of CAPT in improving English pronunciation accuracy of young Pakistani learners by following a carefully designed quasi experimental design and by thoroughly analyzing the data using SPSS.

A pretest and post-test design was implemented to achieve an overall evaluation of the impact of CAPT in improving the participants' accuracy in pronunciation. The Researcher quantified pronunciation enhancements by administering a pronunciation test both before and after implementation of the CAPT program.

CHAPTER 4

DATA ANALYSIS

This chapter presents analysis of quantitative data from the experimental and control groups. This study employed a quasi-experimental research design since it was appropriate for collecting quantitative data suitable to answer the question.

Data were collected from 1st November to December 2023 of class A and B grade 5 in Falcon house Grammar School in Multan, Pakistan. Importantly, the same teacher taught both classes in the entire study, in order for teaching methods and classroom settings to be uniform in both study groups. All students and their guardians were provided with consent forms and collected from all participating students before data collection. As a measure, this guaranteed adherence to ethical protocols and protected the right and the confidentiality of the participants. Further, participants were provided with an in depth account of the goals, methods, and results of the study. Transparent communication enabled the process of getting informed permission and facilitated a collaborative environment that tended to be more efficient for data collection. Quantitative data was collected from the experimental and control groups, and analyzed to look for differences and correlations. These quantitative analysis results are presented systematically and especially address the research topic. This approach will give a more in depth understanding of the outcomes and that which these imply for broad research pursuits.

Experimental Group was given treatment by utilising "Cambridge Online Dictionary". Whereas, Control Group was taught without CAPT by lecture method as learners are accustomed in Pakistani context, to learn English language by a teacher via oral instructions, with the help of white board and board markers. The study's objective was to find out how young English Language Learners (ELL) in elementary school were doing with their pronunciation skills after receiving CAPT), focusing on using the materials offered by the Cambridge Online Dictionary. There were 50 students in total of section A and B of 5th grade, 23 males and 27 females, split equally between two groups—the experimental group had twenty-five students, and the control group had twenty-five students.

4.1 Word List for Pronunciation Test

The researcher selected 15 words from the textbook of "Oxford Progressive English" for level 5 as a subset for assessing pronunciation skills. Each word was assigned a weight of 10 marks, resulting in a total possible score of 150 for the pronunciation test. The scoring methodology adopted was a “dichotomous scoring system”, with students receiving full marks for accurate pronunciation and zero for inaccuracies.

Table 2: Word list of pronunciation tests.

WORDS	TRANSCRIPTIONS
Data	[ˈdeɪtə]
Group	[gru:p]
Flour	[flaʊər]
Prefer	[prɪˈfɜ:r]
Quiet	[ˈkwaɪət]
Soften	[ˈsɒfən]
Island	[ˈaɪlənd]
Scent	[sent]
Permit	[pərˈmɪt]
Accidents	[ˈæksɪdənts]
Brought	[brɔ:t]
Caught	[kɔ:t]
Neighbour	[ˈneɪbər]
Thunderstorm	[ˈθʌndərˌstɔ:rm]
Violence	[ˈvaɪələns]

4.2 Evaluation of Data of Pretest -and Post-Test

The researcher was involved in recording the voices of all participating students and subjecting them to rigorous analysis. Each recorded word was scrutinised three times, alongside the pronunciation provided by the Cambridge Online Dictionary, to discern any disparities. This thorough examination comprised 15 words, each with 10 marks. Students who successfully replicated the accurate pronunciation received full marks, while those whose pronunciation deviated were awarded zero. The purpose of this way of checking pronunciation is to make it fair and clear. Through comparing student recordings and the dictionary, the research study aimed to determine how well the learners could pronounce the words.

4.3 Statistical Data Analysis

The data were analysed using SPSS (version 23) through t-test. A comparison was then made of the pretest and post-test scores of both groups to determine the difference of the means. Furthermore, data was analysed for comparison between and within groups to provide more accurate and lively answers to the queries raised by the current research's collected data.

Table 3: Pretest score of control group and Experimental group.

Students	Pre-test Control	Pre-test Experimental
Student No 1	60	40
Student No 2	60	50
Student No 3	70	60
Student No 4	60	90
Student No 5	70	70
Student No 6	70	60
Student No 7	40	60
Student No 8	50	40
Student No 9	70	60
Student No 10	50	50

Student No 11	40	50
Student No 12	50	90
Student No 13	40	90
Student No 14	100	50
Student No 15	40	70
Student No 16	50	80
Student No 17	60	40
Student No 18	90	30
Student No 19	60	40
Student No 20	50	50
Student No 21	40	30
Student No 22	30	50
Student No 23	100	60
Student No 24	90	90
Student No 25	80	100

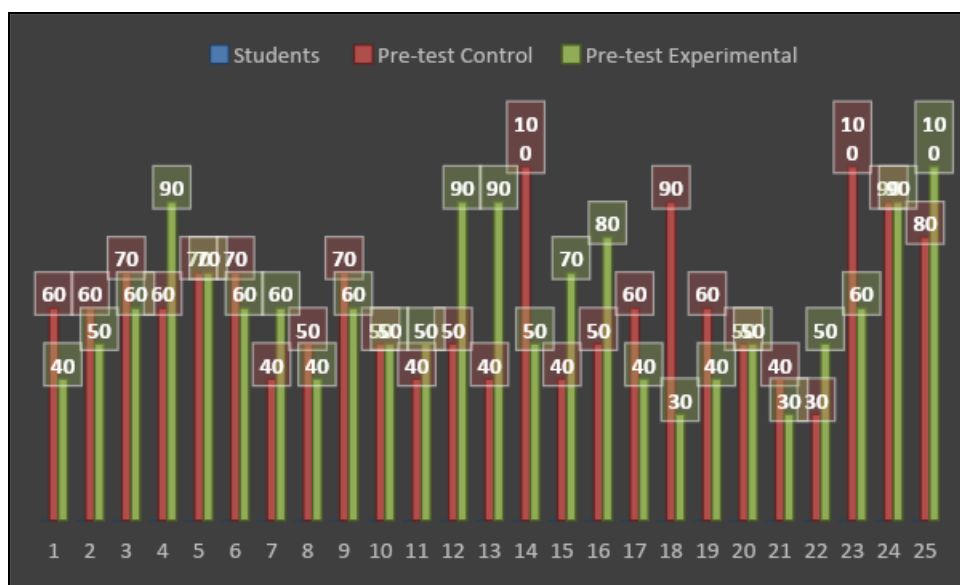


Figure 3: Pre-test control group score vs Pre-test Experimental group score.

4.4 Descriptive Statistics of pretest of Control and Experimental group

Table 4. Descriptive Statistics of pretest of Control and Experimental group

N		Minimum	Maximum	Mean	Std. Deviation
Pre-test control group score	25	30.00	100.00	60.8000	19.56187
Pre-test experimental group score	25	30.00	100.00	60.0000	20.20726
Valid (listwise)	N 25				

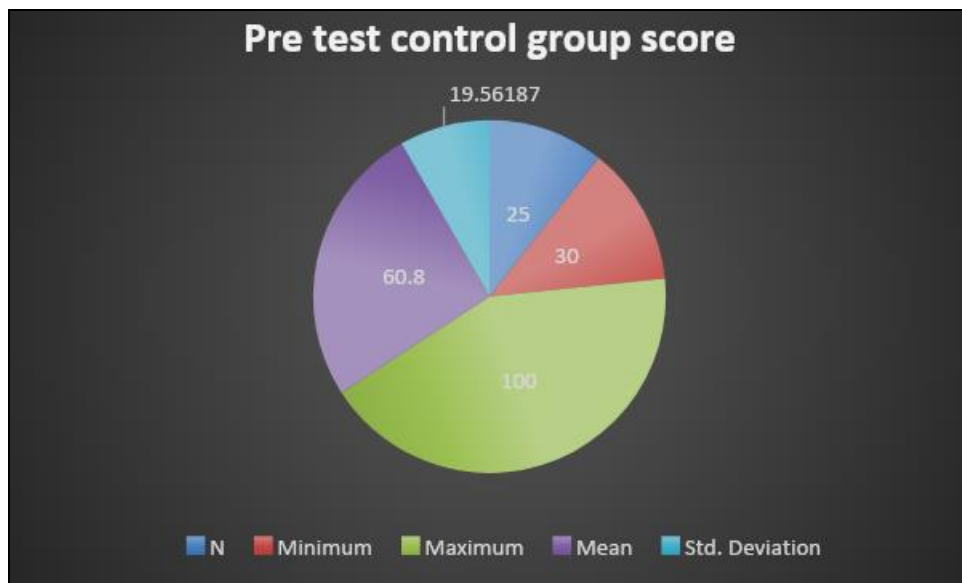


Figure 4: Pre- test control group score

Pre-Test Control Group Score

- Minimum Score: 30.00
- Maximum Score: 100.00
- Mean Score: 60.80
- Standard Deviation: 19.56
- Valid N: 25

Pre-Test Experimental Group Score

- Minimum Score: 30.00
- Maximum Score: 100.00 Mean Score: 60.00
- Standard Deviation: 20.21
- Valid N: 25

4.5 Comparison of Pretest Scores of the Control group and Experimental group

The pretest score ranges for the control and experimental groups were comparable, spanning from (30.00 to 100.00). This implies that individuals in both groups had similar starting performance levels at the beginning of the trial, providing a solid basis for fair comparisons between the groups. By analysing the pretest scores' central tendency, the researcher discovered that the experimental group's mean score was (60.00), while the control group was slightly higher at (60.80). Although this suggests a slight difference in starting performance, it's important to remember that both groups had roughly equal starting performance levels. Thus, the difference is not significant. Additionally, the researcher looked at how each group's results varied; the control group's standard deviation was (19.56), which was marginally less than the experimental group's standard deviation of (20.21). This suggests that, in comparison to the experimental group, there was marginally less variation in the scores within the control group. Despite this distinction, both groups' pretest results showed considerable heterogeneity.

The observed disparity in pretest scores between the control and experimental groups suggests that, before the commencement of the research, the proficiency levels of the participants in both groups regarding pronunciation skills were comparable. This suggests that a comparison was made between the two groups regarding the impacts of the variables under investigation. Despite a modest increase in the average score of the control group compared to the experimental group before the study commenced, this inconsequential differentiation only partially modifies the initial similarity between the two groups. This finding was noteworthy as it suggests that any discrepancies in performance after the research are improbable to be ascribed to students possessing an innate proficiency in accurate pronunciation. The researcher

gained greater confidence that any discernible alterations were due to the interventions implemented during the study and not to fluctuations in pronunciation precision.

These results reveal how crucial baseline equivalency is to maintaining the validity of experimental outcomes between the control and experimental groups. Although there were small differences in the groups' mean scores and variability, they were within a reasonable range, increasing confidence in the following experiments and analyses.

4.5.1 Analysis of Accuracy of Pronunciation Level of Students of both groups in Pretest

In the pretest all of the students mispronounced the words “flour”, “group”, “quiet” and “data”. It's because they never heard the pronunciation of these words accurately as these words are mispronounced by most of the learners. All students needed to be more familiar with the right pronunciation of these words. Even the most talented students in the class couldn't pronounce these words accurately because these students were not guided properly and they never had native speaker's model of pronunciation. The “silent letter words”, i.e., “soften”, “scent”, and “island”, were pronounced correctly by 5 students of the control group and 4 students of the experimental group. The majority of the class of the control group and experimental group mispronounced these “silent letter words”. The non-rhotic words i.e., prefer and permit, were also mispronounced by almost all students of the control group and experimental group except 2 students of the control group and 1 student of the experimental group pronounced the prefer correctly and secured 100 marks in the pre-test. The words “brought”, “caught”, “neighbour”, and “accidents” were pronounced accurately by almost all students of the control group and experimental group, except 1 student of the control group and an experimental group whose score was 30 couldn't pronounce the word neighbour accurately. The word “violence” was pronounced correctly by 15 students of the control group and 13 students of the experimental group. The word “thunderstorm” was pronounced correctly by 18 students of the control group and 19 students of the experimental group. 10 students scored below 60 in the control group. In the Experimental group, there were 11 students whose score was below 60. 2 students in the control group pronounced 10 words correctly and scored 100 and one student in the experimental group scored 100.

Table 5: Pre-test Control group Score vs. Post-test Control group Score.

Students	Pre-test Control	Post-test Control
Student No 1	60	80
Student No 2	60	90
Student No 3	70	90
Student No 4	60	80
Student No 5	70	80
Student No 6	70	80
Student No 7	40	60
Student No 8	50	80
Student No 9	70	90
Student No 10	50	70
Student No 11	40	60
Student No 12	50	80
Student No 13	40	60
Student No 14	100	100
Student No 15	40	60
Student No 16	50	80
Student No 17	60	80
Student No 18	90	90

Student No 19	60	70
Student No 20	50	80
Student No 21	40	40
Student No 22	30	40
Student No 23	100	100
Student No 24	90	100
Student No 25	80	100

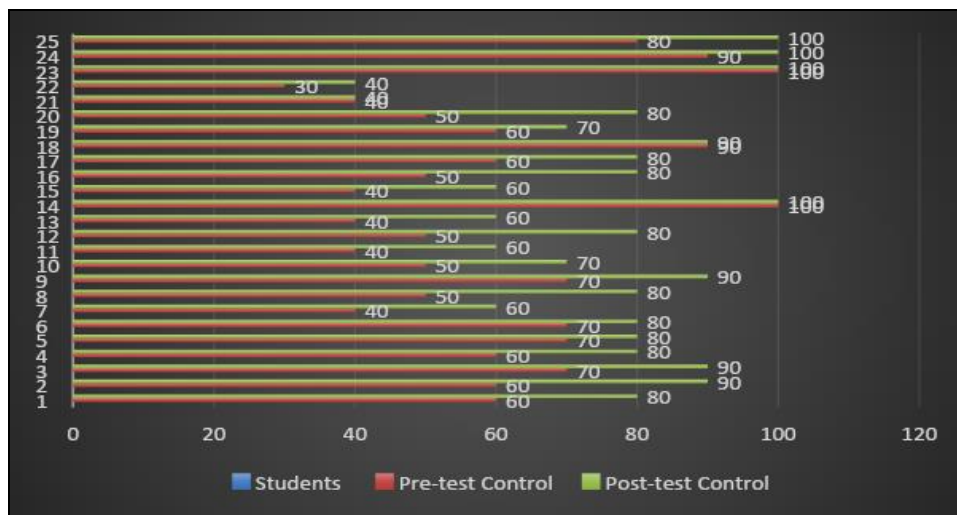


Figure 5: Pre-test Control Group Score vs. Post-test Control Score.

4.6 Descriptive Statistics of pretest and post-test score of control group

Table 6: Descriptive Statistics of pretest and post-test of control group score.

N			Minimum	Maximum	Mean	Std. Deviation
VAR00002		25	30.00	100.00	60.4000	19.46792
VAR00003		25	40.00	100.00	77.6000	16.90168
Valid (listwise)	N	25				

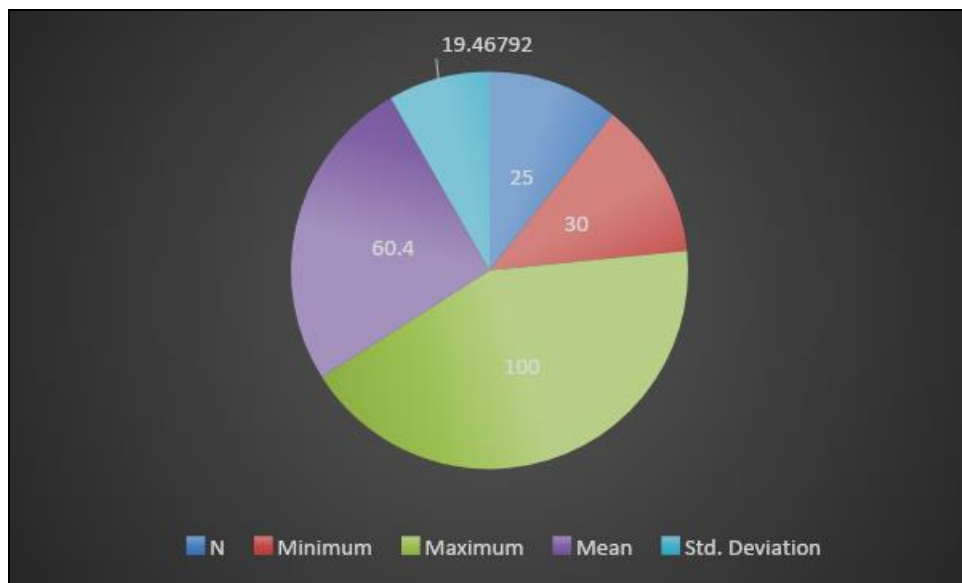


Figure 6: Descriptive Statistics of pretest and post of control group score.

Pre-Test Control Group Score:

- Minimum Score: 30.00
- Maximum Score: 100.00
- Mean Score: 60.40
- Standard Deviation: 19.47
- Valid N: 25

Post-Test Control Group Score:

- Minimum Score: 40.00
- Maximum Score: 100.00
- Mean Score: 77.60
- Standard Deviation: 16.90
- Valid N: 25

4.6.1 Comparison of Pretest and Post-Test Scores of Control group

The pre-test scores indicate a significant variation in performance levels among the control group, ranging from (30.00 to 100.00). The participants' average pronunciation skill level before the intervention is indicated by a mean score of (60.40). The relatively large standard deviation of (19.47) indicates significant variability in individual performance. This suggests that some participants had scores significantly lower or higher than the average group.

After the intervention or training program, the post-test scores consistently enhance pronunciation abilities. The minimum score rose from (30.00 to 40.00), suggesting that even the least successful participants demonstrated progress. The maximum score remained constant at (100.00,) indicating that while certain participants made notable advancements, others sustained their elevated level of proficiency. It is found that the control group had significant increase (60.40 to 77.60) in the mean score indicating overall improvement in the pronunciation abilities of the control group. The standard deviation slightly decreased to (16.90), which implied the narrowing of individual performance scatter after intervention. The consequence was that participants' scores were aligned better with the group mean.

In general, the results of both the pretest and post-test show results of the effectiveness of the training program in improving pronunciation skills of the control group. However, the fact that the average score increased sharply, and with a decrease in variability, implies that most, if not all, of the subjects benefited from the intervention improving, uniformly, their pronunciation skills as an entire group.

The control group had a significant increase (60.40 to 77.60) in the mean score indicating overall improvement in the pronunciation abilities of the control group. The standard deviation slightly decreased to (16.90), which implied the narrowing of

individual performance scatter after intervention. The consequence was that participants' scores were aligned better with the group mean.

The pretest and post test results overall show that the control group benefited from the training program in the sense that their English pronunciation skills have been improved. The intervention appears to have helped most, perhaps all, participants, contributing to a sizable increase in the average score, with reduction of variability indicating improvements and uniformity in the pronunciation abilities of the group. The improvement doesn't appear to have been limited to specific individuals because the minimum and the maximum were both increasing at the same time but improved. This implies that CAPT's intervention of the control group also consistently succeeded in improving pronunciation skills.

4.6.2 Analysis of Renunciation's accuracy Level of Control group in Post-test

The pretest and post-test results show how effective teaching Pronunciation was in enhancing pronunciation skills of the control group. Observations drawn on the improvement made by the control group in the pronunciation skills through traditional teaching methods provide evidence for success as well as areas needing further improvement. Each aspect of the result has been discussed below:

Successes in Traditional Teaching Methods

Enhancement in Pronunciation: Many students in the control group exhibited noticeable improvement in pronouncing specific words like "permit," "prefer," and "soften." These results indicate that the traditional teaching methods such as teaching the concepts of the vowel sounds and silent alphabet letters transmitted enough of these concepts to students improving their pronunciation accuracy.

Improvement in Conceptual Understanding: The concept of non rhotic word (a consonant 'r' sound following vowel sounds, i.e, permit' and 'prefer', and silent letter words, i.e, island, scent, soften, was better grasped by the students and hence was able to speak these words more accurately." This means that phonetic concepts presented to students were understood with traditional teaching methods.

Areas for Improvement and the Role of CAPT

Persisting Pronunciation Challenges: While some words improved, students continued to struggle with pronouncing words such as, 'quiet', 'flour', 'group' and 'data'. Traditional teaching methods alone are thought not enough to provide solutions for all pronunciation nuances, especially those for irregular or complex words.

Lack of CAPT: The Experimental group observed that CAPT technology can effectively address remaining pronunciation challenges. With the feature of interactive learning experiences, real time feedback, CAPT can guide students to refine their pronunciation skills and solve specific pronunciation problems.

Interest and Engagement: Students in the control group, especially with initial lower scores, didn't show much progress because of lack of interest in learning pronunciation, that's why student engagement matters. The factors that may make CAPT more effective than other methods for attracting students' interest and motivating participation in pronunciation practice.

Table 7: Pretest vs Posttest Experimental Group score.

Students	Pre-test Experimental	Post-test Experimental
Student No 1	40	90
Student No 2	50	110
Student No 3	60	110
Student No 4	90	130
Student No 5	70	110
Student No 6	60	100
Student No 7	60	90
Student No 8	40	70
Student No 9	60	110
Student No 10	50	100
Student No 11	50	90

Student No 12	90	120
Student No 13	90	130
Student No 14	50	90
Student No 15	70	110
Student No 16	80	120
Student No 17	40	60
Student No 18	30	50
Student No 19	40	90
Student No 20	50	90
Student No 21	30	70
Student No 22	50	90
Student No 23	60	90
Student No 24	90	120
Student No 25	100	130

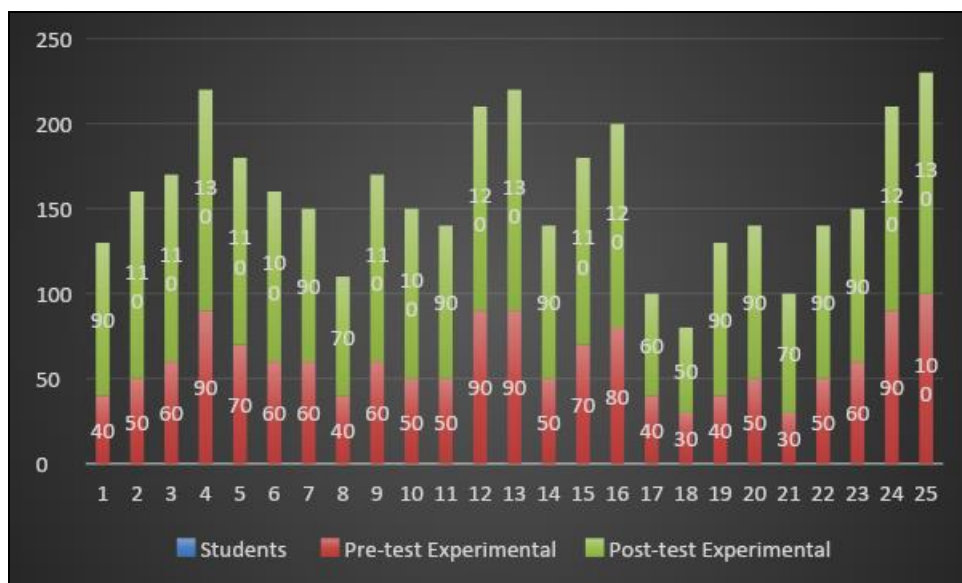


Figure 7: Pretest Experimental Group score vs Posttest Experimental Group score.

4.7 Descriptive Statistics of pretest and post-test of Experimental group

Table 8: Descriptive Statistics of pretest and post-test score of Experimental group

N			Minimum	Maximum	Mean	Std. Deviation
VAR00002		25	30.00	100.00	60.0000	20.20726
VAR00003		25	50.00	130.00	98.8000	21.47091
Valid (listwise)	N	25				

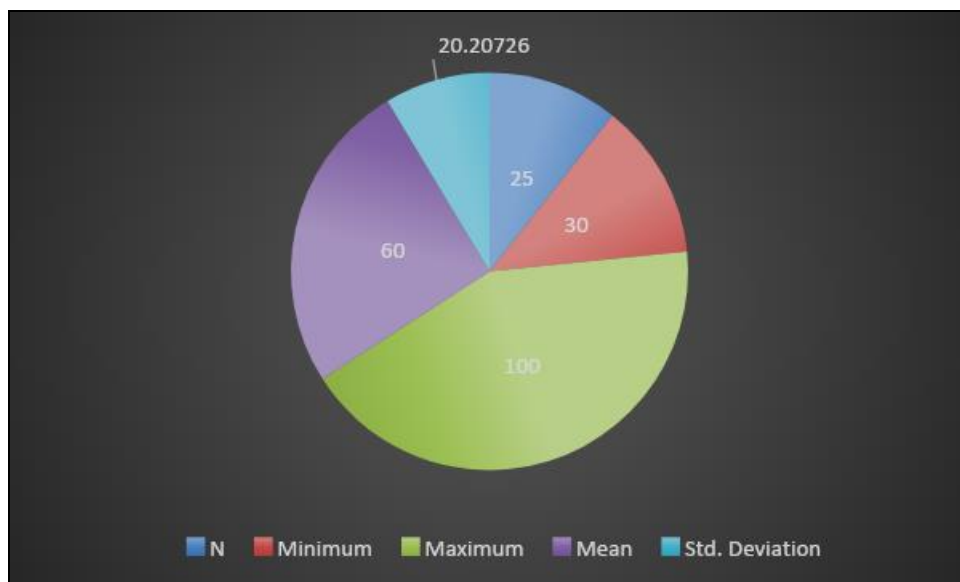


Figure 8: Descriptive Statistics of pretest and posttest score of Experimental group

Pre-Test Experimental Group Score:

- Minimum Score: 30.00
- Maximum Score: 100.00
- Mean Score: 60.00
- Standard Deviation: 20.21

- Valid N: 25

Post-Test Experimental Group Score:

- Minimum Score: 50.00
- Maximum Score: 130.00
- Mean Score: 98.80
- Standard Deviation: 21.47
- Valid N: 25

The pre-test scores of the experimental group show a wide variety of performance levels, ranging from (30.00 to 100.00). The average pronunciation skill levels of the participants before the intervention are indicated by a mean score of (60.00). The standard deviation of (20.21) indicates a level of variability in individual performance. The post-test scores of the experimental group demonstrated a significant enhancement in pronunciation skills after the intervention or treatment. The minimum score has risen from (30.00 to 50.00), suggesting progress even among the participants with the lowest performance. The maximum score has been raised to (130.00), indicating that certain participants have attained remarkably high levels of proficiency following the intervention. The mean score has a significant rise from (60.00 to 98.80), suggesting a noteworthy overall enhancement in pronunciation abilities among the experimental group. The standard deviation experienced a slight increase to (21.47), indicating that although there was still variation in individual performance, the scores range expanded slightly following the CAPT treatment.

Mean scores increased substantially from the pretest to the post-test from the experimental group, indicating that great benefit was gained by the experimental group in learning information related to pronunciation level from the CAPT technology treatment.

Post-test standard deviation (21.47) is slightly higher than pretest standard deviation (20.21) so that post-test results are slightly more variable than results before the treatment.

The improvement is due to the effectiveness of the CAPT technology in improving pronunciation learning and allowing individualised feedback to the students.

Results indicate that CAPT technology can effectively teach pronunciation and the experimental group not only enhanced their pronunciation skills to a significant level.

These results are compared with the results of the control group to gain further insight into the additional impact of the CAPT technology treatment on pronunciation improvement.

4.7.1 Analysis of Pronunciation's accuracy level of Experimental group in post-test:

The observation of the Experimental group's test scores revealed that the combination of the CAPT technology with the use of Cambridge online dictionary resulted with astonishing improvements in post test scores. This success can be attributed to several key factors: The Experimental group was found to have Engagement and Enthusiasm for learning pronunciation with CAPT technology. Students were more active in their participation in classes, and were more attentive during classes which made the learning environment also more conducive to learning, which in itself would result in more active engagement with the material.

Interactive Learning Process: CAPT technology is interactive and students can have access to resources such as the Cambridge Online Dictionary. They could actively use it in pronunciation by repeating sounds and words etc and thus could have a better understanding and retention for the relative concepts of language.

Enjoyable Learning Experience: Students had a wonderful impression as to how the teaching of pronunciation through technology was conducted. Computer gamification developed in CAPT helped to make the learning process fun, which caused the learners to have endeavour and devote time towards practicing their pronunciation.

CAPT Instruction: CAPT technology means that the type of instruction appropriate for individual learners was being provided. Pronunciation issues could be resolved instantly in this case, and students could specifically train distinct unclear sounds and problems, such as the pronunciation of particular types non-rhotic British English where 'r' remains unheard if it is before consonant sounds and other silent letters words as for example 'island,' scent,' 'soften.'

Integration of Learning Vocabulary: There was an enhanced pronunciation of sounds, along with ease in the learning of new vocabulary through CAPT technology.

More specifically, students could learn new words while in the process of practising the pronunciation of words, thereby repeating the learning of the word and its pronunciation at the same time.

Clear Scoring Criteria: A specific criterion for scoring accuracy in the pronunciation differentiated the researcher's practice and offered the students direction. Although rather severe, that approach prompted students to work harder for achieving better distinctness in enunciation.

Comparison with Non-Experimental Group: Experimental group enhance remarkably the result recorded to demonstrate the effectiveness of the CAPT-based teaching approach done for those students with low score before taking the treatment. This method is indeed productive, amply illustrated by the disparity with the Control group. Altogether, causes of success of the Experimental group include creative approaches to teaching and learning, information and communication technology, individualized instruction and effective learners' climate. By communicating all the features of CAPT technology, the researcher was able to achieve development of the techniques in the pronunciation of specific sounds and the general acquisition of vocabulary through engaging the students in computerized classroom participation, therefore raising marks in the post tests of the Experimental group.

Table 9: Post-test Control Group Score vs Post-test Experimental Group Score.

Students	Post-test Control	Post-test Experimental
Student No 1	80	90
Student No 2	90	110
Student No 3	90	110
Student No 4	80	130
Student No 5	80	110
Student No 6	80	100
Student No 7	60	90
Student No 8	80	70
Student No 9	90	110
Student No 10	70	100
Student No 11	60	90
Student No 12	80	120
Student No 13	60	130
Student No 14	100	90
Student No 15	60	110
Student No 16	80	120
Student No 17	80	60
Student No 18	90	50

Student No 19	70	90
Student No 20	80	90
Student No 21	40	70
Student No 22	40	90
Student No 23	100	90
Student No 24	100	120
Student No 25	100	130

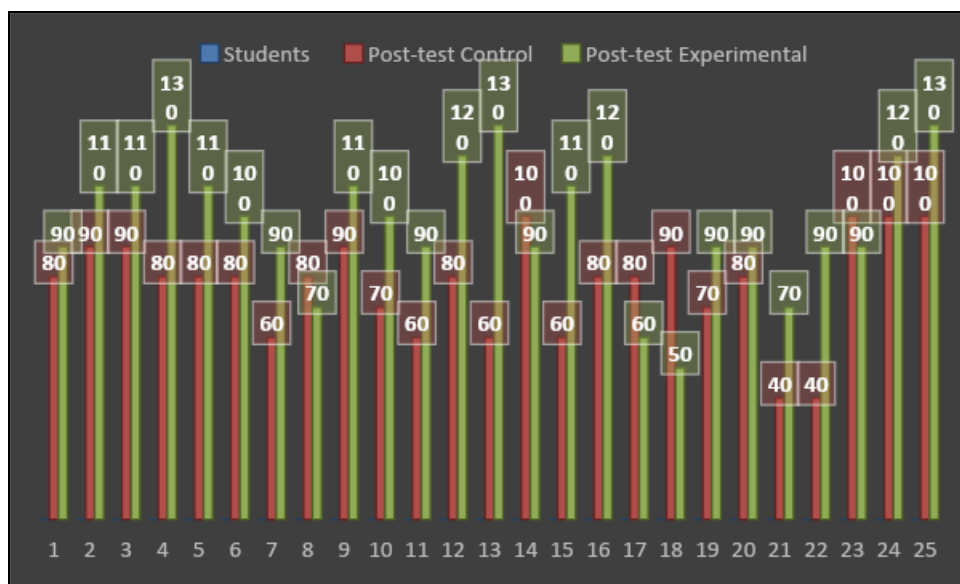


Figure 9: Post-test Control Group Score vs Post-test Experimental Group Score.

4.8 Descriptive Statistics of pretest and post-test of Experimental group

The detailed statistical analysis of post-test scores of both groups is shown by table, graph, and pie chart, and a detailed description of the statistical analysis of scores is also discussed below.

Table 10: Descriptive Statistics of Post-test Score of Control and Experimental

N			Minimum	Maximum	Mean	Std. Deviation
VAR00005	25		40.00	100.00	77.6000	16.90168
VAR00006	25		50.00	130.00	98.8000	21.47091
Valid (listwise)	N	25				

Group.

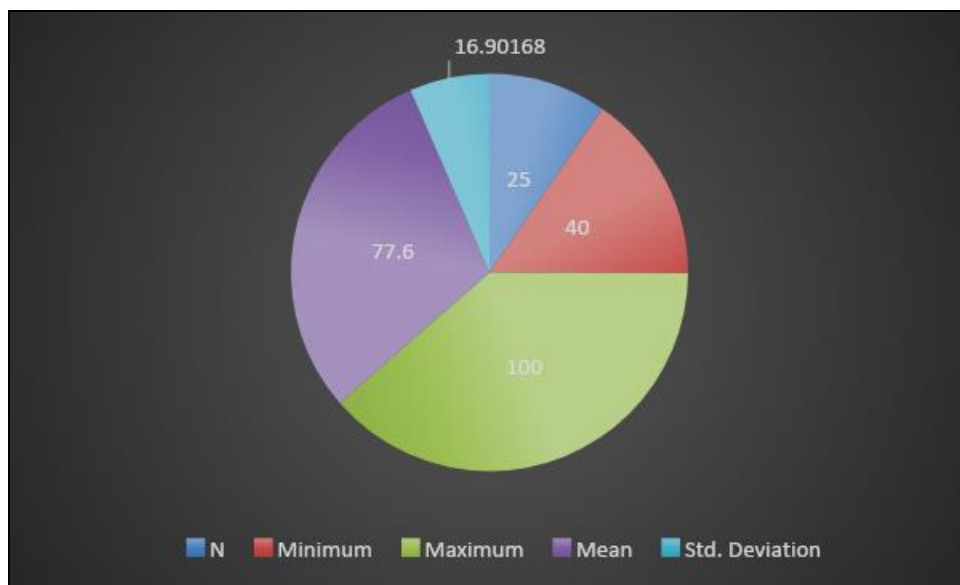


Figure 10: Descriptive Statistics of Post-test Score of Control and Experimental Group.

Post-Test Control Group Score:

- Minimum Score: 40.00
- Maximum Score: 100.00
- Mean Score: 77.60
- Standard Deviation: 16.90

Valid N: 25 Post-Test Experimental Group Score:

- Minimum Score: 50.00
- Maximum Score: 130.00
- Mean Score: 98.80
- Standard Deviation: 21.47
- Valid N: 25

Difference of Post-test Scores between Control and Experimental Groups: The difference of the post-test scores of the control group and experimental group provide insights into the impact of teaching pronunciation through CAPT treatment implemented in the experimental group relative to the control group.

Mean Score Comparison: The average score of the experimental group (98.80) is significantly greater than that of the control group (77.60). This suggests that, on average, participants in the experimental group exhibited superior performance in the post-test in comparison to those in the control group. The disparity in average scores indicates that the intervention or treatment administered to the experimental group had a beneficial effect on their pronunciation abilities.

Range of Scores: The scores in the experimental group have a wider range, ranging from (50.00 to 130.00) compared to the control group, ranging from (40.00 to 100.00). This suggests greater diversity in the participant's performance in the experimental group compared to the control group. While certain participants in the experimental group attained remarkably high scores, others may have demonstrated more moderate enhancements. Conversely, the control group's scores were more tightly grouped around the average.

Standard Deviation: The experimental group has a higher standard deviation (21.47) than the control group (16.90). This further reinforces the observation of increased score variability within the experimental group. The greater standard deviation indicates that there was a wider range of individual performance in the experimental group compared to the control group.

4.9 T-Test

To support the results, the researcher has done a T-test.

Table 11: The result of the T-test (Independent T-Test Sample) between Experimental and Control Groups.

Group	Mean (Pre-test)	Mean (Post-test)	t-value	p-value	95% CI Lower	95% CI Upper
Control Group	60.8	76.4	-3.1035	0.003269	-25.718	-5.482
Experimental Group	60.0	98.8	-6.5797	3.296e-08	-50.658	-26.942

Table 11 summarises the mean pretest and post-test scores for both groups and the t-values, p-values, and 95% confidence intervals for the difference in means. The increase in the mean score of the experimental group showed that the CAPT treatment given to the experimental group impacted the student's pronunciation. Students of the experimental group learnt better using CAPT treatment and had better outcomes than the control group students who were taught by conventional methods.

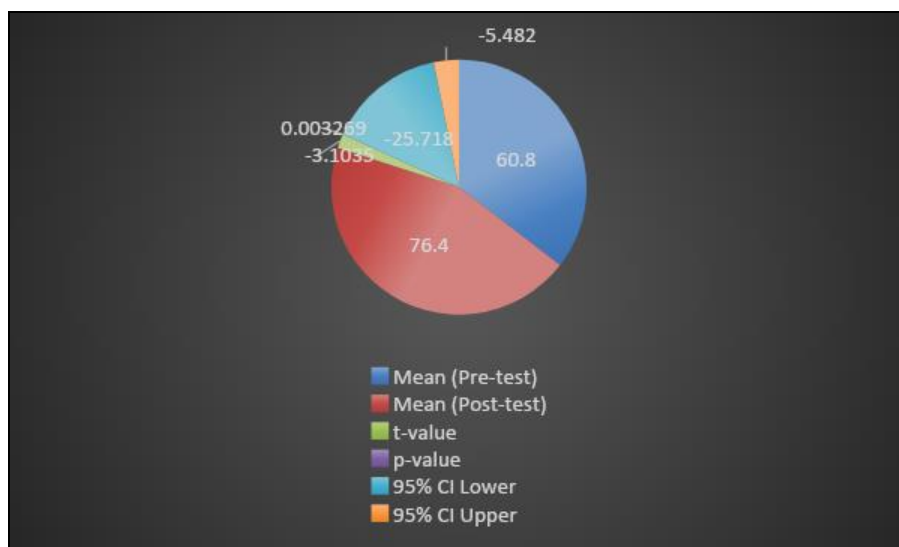


Figure 11: Results of T-test

The results of the independent samples t-test comparing the pretest and post-test scores of the control and experimental groups are as follows:

Control Group:

Mean (Pre-test): 60.8

Mean (Post-test): 76.4

t-value: -3.1035

p-value: 0.003269

95% CI Lower: -25.718

95% CI Upper: -5.482

Experimental Group:

Mean (Pre-test): 60.0

Mean (Post-test): 98.8

t-value: -6.5797 98.8

p-value: 3.296e-08 95% CI Lower: -50.658

95% CI Upper: -26.942

Based on these results, we can interpret as follows:

Conducting T-Test:

Difference in Pretest Means: -0.80

The mean of the experimental group in the pretest was 60.0 and the mean of the control group was 60.80. It shows that the experimental group started with a slightly lower pretest mean than the control group, with a difference of about 0.8 points.

Difference in Post-test Means: 22.40

The mean of the experimental group in the post-test is 98.8 and the mean of the control group is 76.4 which shows that the experimental group improved much more than the control group, with a post-test score that is 22.4 points higher than the control group's post-test mean.

Difference in t-values: -3.4762

The experimental group's t-value is more negative by 3.48, indicating a larger and more significant difference between pretest and post-test scores compared to the control group.

Difference in 95% CI Lower Bound: -24.94

The experimental group's lower bound of the confidence interval is 24.94 units lower than the control group, reflecting a greater magnitude of improvement.

Difference in 95% CI Upper Bound: -21.46

The upper bound of the experimental group's confidence interval is 21.46 units lower than that of the control group, indicating a larger and more consistent improvement in the experimental group.

The t-values for both the experimental groups are negative, indicating that the mean pre-test scores are lower than the mean post-test scores in the experimental group. The p-values for both groups are less than the significance level of 0.05, suggesting that the observed differences in mean improvement are statistically significant. The 95% confidence intervals for the difference in means do not include zero for either group, further supporting the rejection of the null hypothesis. The difference in t-values between the two groups (-3.1035 for the control group and -6.5797 for the experimental group) further highlights the stronger impact of the intervention in the experimental group. The larger t-value in the experimental group reflects a much more substantial effect. Similarly, the extremely small p-value for the experimental group (3.296e-08) compared to the control group's p-value of 0.003269 indicates that the observed improvement in the pronunciation of experimental group is not only statistically significant but also highly unlikely to have occurred by chance.

Interpreting Results: We reject the null hypothesis since the p-values are less than the chosen significance level ($\alpha = 0.05$). These results indicate that there is a statistically significant difference in improvement of pronunciation between the control and experimental groups. Furthermore, the experimental group demonstrates a more significant mean improvement in pronunciation than the control group. Overall, these findings support the impact of the teaching pronunciation through CAPT technology improved pronunciation skills, as indicated by the significant improvement observed in the experimental group compared to the control group.

These differences show that the experimental group experienced a significantly greater improvement in pronunciation compared to the control group, both in terms of their post-test performance and the statistical significance of the change.

4.10 Analysis of the Research Question

The pretest and post-test scores of the dependent variable of control and experimental groups explored the analysis of this present research study.

Does teaching pronunciation through CAPT work better than the conventional method at primary level?

To explore the impact of CAPT on teaching pronunciation, “Cambridge Online Dictionary” was used for teaching pronunciation. The students in the experimental group taught by the CAPT programme showed a significant improvement in their post-test results compared to the control group. The difference of scores is shown in the above tables. The students in the experimental group showed interest in learning pronunciation using advanced technology. Students participated actively throughout the CAPT class. The students of the experimental group who had low scores in the pretest also showed improvement. Still, the students of the control group with low scores didn’t show significant improvement in pronunciation, which showed that teaching pronunciation through CAPT helped the students in learning pronunciation. According to the researcher, the impact of CAPT appears on pronunciation but needs continuous practice. The impact of CAPT appears after continuous practice of using software for pronunciation.

The higher mean post-test score in the experimental group provides evidence of CAPT technology’s effectiveness in facilitating pronunciation improvement. The results support the adoption of CAPT technology as an effective tool for language teaching, particularly in enhancing pronunciation skills. Further analyses can explore specific aspects of the CAPT technology treatment that contributed most to the observed improvement and identify areas for refinement or enhancement. Overall, comparing post-test scores between the control and experimental groups highlights the additional benefit of using CAPT technology for pronunciation training, as evidenced by the higher mean score in the experimental group.

From this, the researcher observes that:

Both groups showed improvement from the pretest to the post-test, as indicated by the increase in mean scores. The experimental group had a larger increase in mean score compared to the control group. Specifically, the experimental group's mean score increased by 38.80 points (98.80 - 60.00), while the control group's mean score increased by 17.40 (77.40 - 60.80). Therefore, it is proved that teaching pronunciation through CAPT works better than the conventional method at primary level as the experimental group, taught by the CAPT technology treatment, demonstrated greater pronunciation improvement than the control group taught by the conventional method.

4.11 Discussion

The significant increase in average scores observed from the initial to the final assessment in the experimental and control groups provides strong evidence of improved pronunciation skills throughout the study. The increasing pattern indicates that the instructional interventions, whether using traditional methods in the control group or the innovative CAPT (Computer-Assisted Pronunciation Training) technology in the experimental group, successfully improved the students' pronunciation skills.

Additionally, the experimental group showed a significantly higher average score in the post test, to which CAPT technology treatment was given, in comparison to the control group. Comparison of the average scores between the two groups demonstrates pronunciation improvement due to the CAPT technology intervention effect. The effectiveness of the CAPT technology in targeting specific pronunciation challenges and facilitating accelerated learning and skill development among the experimental group participants can be attributed to its interactive and personalised nature, which allows for immediate feedback.

The results showed that students who were provided with CAPT tools showed better performance in the post test evaluations than those not exposed to CAPT interventions.. The notable rise in mean scores from the initial test to the final test, along with the higher average score in the experimental group during the final test, presents convincing proof of the beneficial effect of the CAPT technology intervention on enhancing pronunciation. Nevertheless, the range of scores within the

experimental group highlights the necessity for additional research on specific factors that affect the outcomes of pronunciation learning.

4.12 Summary

In chapter 4 of the data analysis, a quasi-experimental research was conducted to assess the “Impact of CAPT on pronunciation accuracy. The purpose of this study was to find out the effect of CAPT on pronunciation learning. These sounds were taught to the learners by employing Cambridge Online dictionary to examine the effect of CAPT on pronunciation of 5th graders at school level in Pakistan. The learners were selected from already existing two groups of grade 5 by non-random selection. One group was taught by using a laptop connected with a speaker to teach pronunciation through a laptop by using Cambridge Online Dictionary and while the second group was given treatment by the researcher through conventional methods without using CAPT. The chapter emphasis the substantial rise in mean scores in the experimental and control groups from the preliminary evaluation to the ultimate assessment. According to this finding, pronunciation abilities improved noticeably during the study. The mean score of the post test of the experimental group who administered the CAPT technology intervention, was significantly higher as compared to the control group. It seems that implementation of CAPT contributed to the improvement of pronunciation. Implicating the implementation of CAPT technology as a powerful tool for language instruction, especially for pronunciation training, is data analysis. Further analyses should be carried out to specifically explore how certain parts of the CAPT technology treatment contribute to progress, identify areas that need to be improved or enhanced. Results of the research showed how CAPT technology could improve the fifth graders’ ability to pronounce words. This finding suggests that the implementation of CAPT positively impacted the improvement of pronunciation. The research findings illustrated the effectiveness of CAPT technology in enhancing the pronunciation abilities of fifth-grade students. Descriptive statistics and statistical analyses found that the experimental group score significantly higher in post – test scores than the control group. The results support the capability of pedagogical approaches, like CAPT technology, in improving results on language acquisition.

CHAPTER 5

DISCUSSION, RECOMMENDATIONS, AND CONCLUSION

5.1 Introduction

One of the important parts of the research studies is the conclusion chapter which gives an overview of the most important aspects of the study endeavor and the findings made during the course of the study. This last section aims to provide an overview of the major implications of the study by discussing the results of the proposed hypotheses. Moreover, it addresses the broader significance of the study and discusses the possible contributions that the study can make to the existing stock of knowledge. In the light of the above, the strengths of the research are evaluated in this chapter in as much as it is possible within the framework of this chapter in order to show how the research is valid. At the same time, challenges or contradictions emerged during the study are explained to identify the areas that are ready for further development and improvement. This critical reflection enhances the validity of the results and also contributes to the enhancement of culture of development in the academic disciplines.

Also, it is essential to perform an honest analysis of the limitations that have been set in the course of the research. This will show the degree to which the findings may be generalized. Lots of attention is paid to ethical issues, an important factor of any research process, in order to ensure that the pursuit of knowledge remains an ethical pursuit of humanity. The conclusion chapter brings the research journey to an end and provides a full analysis of the outcomes. The significance and applicability of the findings of the study are well articulated in this discussion section. The emerged data provides a map for the further academic investigations and discoveries to come. Thus, the chapter not only provides a brief of what has been discussed in the study, but also ushers in a new era of thinking, thus providing a road map for the future of the discipline.

5.2 Discussion

Fifty students were selected to participate and they were split into two groups: the Experimental Group and the Control Group. These groups were formed and a pre-test was done to assess the students' level of pronunciation before the first class. The researcher used a conventional method of teaching the control group and CAPT to teach the experimental group. The posttest was then administered and the collected data was properly evaluated. Besides, data analysis used quantitative inferential statistics and was analyzed by Statistical Packages for the Social Sciences (SPSS) version 23. In each statistical test performed, the significance level was always less than the standard level of $p < .05$. The quantitative data were analysed using SPSS (version 23). Specifically, the posttest results reveal that CAPT treatment was more effective than the traditional classroom training we conventional group. Their pronunciation is greatly enhanced because of the use of CAPT lessons which include the use of the Cambridge dictionary that contains the pronunciation of native speakers. This improvement may be attributed to the reason that the CAPT technique was interesting and the students were more engaged in the classroom.

5.3 Findings

5.3.1 Enhancement of Pronunciation Skills and the Efficiency of CAPT

The findings of this research study have significant implications for pedagogical practice and language learning. Integrating Computer-Assisted Pronunciation Training (CAPT) technology in language instruction provides instructors an opportunity to provide interactive learning experiences and individual feedback to their learners leading to better pronunciation acquisition. Immediate feedback and direction is what CAPT can provide which would be very beneficial to learners who might never encounter with native speakers or language instructors. This technology helps simplify the students' process of pronunciation skill improvement and practice by creating a more immersive, more stimulating learning environment.

Additionally, this research suggests that developing pedagogical approaches to language learning should be based on evidence. Research data can be used to help educators grow more productive pedagogical approaches that are more grounded in scientific validation. This research has the potential to yield further investigation in this field, to yield more customized and effective language learning interventions,

which will ultimately result in greater language proficiency and communication skills for students. By reducing the gap between theoretical knowledge and practical application, these developments can ensure that students have the tools to utilise their language skills in authentic contexts effectively.

Section B was given the CAPT treatment as the Experimental group. On the other hand, no CAPT intervention was provided for the control group, Section A. By configuring this way, this allowed a transparent comparison of the pronunciation instruction of the two groups, highlighting the valid efficacy of CAPT in pronunciation instruction. The primary purpose of CAPT was for training and practice that takes place with pronunciation, with its students able to enjoy interactive, thought provoking exercises meant to intensify their pronunciation skill. Also, students were helped to sound the words correctly using the Cambridge Online Dictionary with phonetic transcriptions and listening examples. Using a combination of CAPT and reliable online resources, the experimental group's students were able to obtain a thorough and efficient pronunciation instruction. The researcher was able to analyse the data to find out whether the learners' pronunciation had improved after processing the Computer-Assisted Pronunciation Training (CAPT). The study specific objective was to find out whether the learners' pronunciation skills were significantly improved as a result of using the Online Cambridge Dictionary. The researcher evaluated the learners' pronunciation development before and after the intervention to find out whether CAPT method was effective.

The purpose of this research was to investigate how CAPT affects pronunciation skill development of young English Language Learners (ELLs). The focus of the examination was on the use of the Cambridge Online Dictionary as a set of pronunciation enhancement tools. Research was done on the educational level in Pakistan in grade 5 students. The Cambridge Online Dictionary was used to provide pronunciation instruction for a cohort designated the Experimental group, who learned with a laptop connected to a speaker. The Control Group proceeded with regular traditional methods, without the use of CAPT treatment.

The identical instructional material was utilised for both groups, obtained from the "Oxford Progressive English" textbook designed for level 5. The researcher administered lessons in person to ensure consistency in the quality and instruction approach. The treatment of the Experimental group consisted of utilising the

Cambridge Online Dictionary, which supported learning through pronunciation guides and audio examples. Conversely, the Control Group received instruction via conventional lecture approaches, which are prevalent in the educational landscape of Pakistan. Assisting in comprehension and reinforcing knowledge, the researcher utilised a whiteboard and board markers while delivering verbal instructions using this approach.

The study's objective was to assess the extent to which the pronunciation skills of elementary school students improved as a result of the CAPT intervention. The primary emphasis was on the resources provided by the Cambridge Online Dictionary and their efficacy in augmenting the pronunciation skills of young learners. The population of this study was 50 students, of which 23 were identified as male and 27 as female. The students were equal in the two groups; twenty-five students comprised the Experimental group, and twenty-five students comprised the Control group. By comparing the two groups, the researcher aimed to ascertain the effectiveness of CAPT in enhancing pronunciation abilities. Computers play an essential role in today's educational institutions, particularly when tackling the issues of language acquisition, mainly spoken competency, among secondary school students, as shown by the results of this study. In Pakistan, where many students still need to be familiar with phonetic sounds, this demand is more prominent, further exacerbating the urgent need for efficient solutions within the educational framework. This study indicates recurring challenges in current pronunciation software that must be solved before broad adoption. Previous research has investigated various systems that teach pronunciation, but this study exposes difficulties that continue in these programs.

5.3.2 Experimental Group Demonstrated Better Outcomes

The study initiatives that have been stated above investigate the impact of CAPT technique, as well as the influence that it has on post-test scores among two different groups. The researchers, motivated by the desire to get a better knowledge of the results of CAPT, made great efforts to carry out this study although they encountered obstacles. However, the findings demonstrate a significant change in post-test scores for the Experimental Group, and a significant improvement was detected. This improvement in scores reached the statistical significance level compared to the control group.

The post-test scores of the control and experimental groups show that the respective interventions' outcomes differ significantly. The experimental group demonstrated a significant improvement in scores mean = (98.80); and standard deviation = (21.47) compared to their pretest scores. The observation is in support of the idea that the intervention, CAPT, as a way to increase the performance of the experimental group proved to be effective. Experimental groups minimum is (50.00) above the highest of the control group. This means that being in the experimental group at all produced higher performance than being in the control group, even for the poorest performing subset. Or how stark was the difference in the experimental group in favour of the efficacy of the intervention strategy. It is furthermore proved that the experimental group participants could generate impressive performance as the experimental group's mark was (130.00). The effect of the experimental treatment is so profound that the obtained upper limit always sits way above the maximum score achievable by the control group.

The standard deviation is narrower for the experimental group, than for the control group, which is further evidence that boosting is more uniform and reliable for all participants. This means that the intervention not only became more consistent across the members of the experimental group, but also exerted more influence on all the experimental group members. Pretest scores of the Experimental Group revealed a very broad range of performance (30.00 to 100.00). Despite this dispersion, the average pretest score was (60.00) intimating that the participants had some degree of proficiency in pronunciation before the test. However, after implementation of CAPT, subjects' pronunciation abilities were shown to have improved quite significantly. The mean score in the experimental group was significantly elevated to (98.80).

The significant increase in scores shows that CAPT significantly improves students' ability to pronounce. Even the participants who had lower pretest scores (minimum score of 30.00) grew some, but those with higher pretest scores showed substantial improvement (growing from a pretest score of 50.00 to a post test score of 100.00). CAPT was successful in meeting the needs of students that it served students over a broad spectrum of accuracy levels, and was able to provide substantial progress to students in all accuracy levels.

The Maximum post test score of (130.00) gave further evidence that the Experimental Group made significant progress. It also means that, based on both

minimum and maximum scores, CAPT introduction has given a very big all encompassing improvement of English pronunciation proficiency. Recent studies (here) indicate that (CAPT) enhances pronunciation accuracy among those learning a new language. Post test score improvements across the board for the Experimental Group at all performance levels support the effectiveness of CAPT technology to impart robust increases in pronunciation abilities. The rise in average scores, plus improvements across all levels of performance, when taken together show a great deal of progress by members of the Experimental Group over pretest baselines, and most powerfully suggest the impact of CAPT on pronunciation proficiency.

Post test scores showed that the post-test scores clearly exhibited superiority of the experimental group as compared to the control group. Results showed that the mean, minimum & maximum score and the standard deviation is greatly increased in the experimental group compared to the control group, and that it is these that factor that indicated the significant improvement of participant's performance in the intervention or treatment.

5.4 Strength of the Study

Pronunciation is a significant aspect of language acquisition that is often neglected, and this research investigates it in depth. When learning a second language, especially in Pakistan, where the emphasis has historically been placed on grammar and vocabulary, the attention to pronunciation could be stronger. This study's strength rests in the fact that it acknowledges the existence of this gap and makes an effort to fill it by using computer-assisted pronunciation training (CAPT).

One of the program's critical strengths is its recognition of the difficulties that second language learners have when acquiring pronunciation, which is often strange to them because of the attention it gets in typical language education settings. The research sheds light on the significance of accurate pronunciation teaching in developing fluency in a second language by bringing attention to this particular subject for clarification.

5.5 Contribution of Study

This research study contributes to language teachers, whether native speakers or not, in facilitating good pronunciation teaching. The research promotes the

professional development of educators to better serve their students by highlighting the need for teachers to have a basic grasp of phonetics and articulatory processes. The study highlights the need for more resources and training possibilities available in Pakistani educational institutions for students and teachers regarding accurate pronunciation. It highlights the importance of a significant problem and the requirement of treatments such as computer-assisted pronunciation learning to close this gap.

Furthermore, the research sheds light on the changing role of language instructors, who are now required to keep their linguistic skills up to date and manage the communication obstacles brought about by technology breakthroughs such as computer-augmented pronunciation training. This acknowledgement highlights how important it is to modify instructional strategies to use contemporary tools and technology to improve learning results.

The research proposes a workable solution to the issue uncovered by applying CAPT. Not only does the use of technology in language classes solve the problems of conventional education methods, but it also coincides with the more significant trend of adopting digital resources to enhance learning experiences.

This study contributes to the professional development of language instructors, its comprehensive examination of the challenges associated with pronunciation instruction in second language learning contexts, and its proposal of practical solutions by integrating computer-assisted learning techniques. In a nutshell, this study's strength lies in including all of these aspects. Addressing these concerns, the research lays the path for more prosperous and inclusive language teaching methods in Pakistan and worldwide.

5.6 Limitations of the Study

Although this study's findings provide vital insights into using computers to improve English pronunciation, it is essential to note that it has faced certain limitations.

The study base is a small sample size which limits the findings. The results are less generalisable since there has been only one school sampled and two classes only from that school. In addition, further investigation should include a more diverse, yet larger sample size, to support the generalizability of the findings on the greater

population. This may mean simply drawing from people of different socioeconomic status, or from different schools or different places of geographic location to have a broader sample. The trial was only six weeks long, however, a relatively short time in which to test an intervention that may need to be sustained over time, so the question remains whether the intervention is needed only provisionally or for the long haul. The gains in pronunciation accuracy can be much more considerable with the increased amount of time spent using computer assisted pronunciation training. Furthermore, shorter duration may limit the range of learning opportunities and preclude the analysis of relatively complex outcomes. Limitations of this research exist however, and require that this finding be used with caution when interpreting and implementing it, even if this does provide valuable insight into English pronunciation improvement of young ELLs aided by computer technology. By addressing this more inclusive sample, other geographic representations and longer intervention duration in the next study, validity of this study will be better and will include more situations that do not occur right away in the educational world.

5.7 Conclusion

In Pakistan, learners have uncertainty, lack of confidence, and many mistakes hence need help in pronunciation. However, they have spent plenty of time learning English. However, absence of interaction with native speakers and poor training of teachers in pronunciation pedagogy are what worsen the problem by now creating further stress and anxiety when trying to communicate in English. Careful and systematic use of the CAPT was made to produce a very clear (ie, 'distinct') Experimental/Control Group differentiation. Using a laptop connected to a speaker and the Cambridge Online Dictionary, we made available for the members of the Experimental Group advantageous pronunciation instruction possible through technological means. The purpose of this recent technique was to harness the interactive features in the CAPT to enhance student pronunciation.

However, the Control Group followed the conventional instructional approaches that reflect the typical approaches used in education in Pakistan. Visual aids such as whiteboards and board markers were used to support traditional lecture based methods. While it is viable in certain situations, such as those emphasizing predetermined aspects of behavior, the conventional approaches were missing the interactive and dynamic character inherent in CAPT. Interestingly, instructional

materials for both groups were the same (identical), provided by the “Oxford Progressive English” textbook for level 5. Having a consistent way of delivering content in the system can make an equitable comparison of the two groups. Additionally, the methods and level of instruction for both groups were made uniform by the researcher.

The Cambridge Online Dictionary, with pronunciation guides and audio examples, was made available to the experimental group. In this treatment you could notice the deviation from the traditional instructional methods. The goals of this research were to use technology powered resources to enhance the educational journey and by possibly accelerate the process of gaining pronunciation abilities.

The study’s results suggest that computer assisted pronunciation training holds the promise for significantly improving language teaching. Using technological opportunities to transform the monotonous and tedious process of pronunciation practice into an activity which is enjoyable and even fun, and paradoxically leads to measurable improvements in the learners' ability. Going forward, CAPT can be incorporated into language instruction curricula in Pakistan, to revolutionize the way English is taught, and learned across the country, resulting in more effective and engaging language learning experience for students across the country; it can also help celebrate diversity in schools by making good use of linguistic resources nurtured within the families of those attending the school.

As a conclusion, the study performed on the effect of CAPT on the accuracy of pronunciation among Pakistani English Language Learners constitutes a worthwhile addition to the domain of language education as well as technology enhanced learning. The findings in the research provide useful insights which may be utilized to impact pedagogical practices, curriculum development, and educational policies which aim to improve English language competence among multiple groups of learners. Analysis of effective CAPT treatments is made in order to obtain these insights. Thus, the results of this study present an opportunity for positive modification in language learning approaches which will ultimately enable learners to gain better communicative competence and be better able to operate in a world becoming more integrated.

5.8 Future Recommendations

This research was conducted on CAPT within the educational institutions of Pakistan and it forms a good groundwork for future researchers. It is a vast array of computer-assisted pronunciation training (CAPT) resources that could significantly benefit language learning outcomes across a variety of domains, including reading, writing, listening, grammar, vocabulary, and supra-segmental characteristics of pronunciation. This study focused primarily on Cambridge online dictionary, but many CAPT resources are available. Future research initiatives should investigate the usefulness of various CAPT methods and dig into qualitative ways to complement the quantitative results. This will further enhance our knowledge and allow us to comprehend the world better. Qualitative research methods may gain a comprehensive understanding, especially when clarifying the complex relationship between segmental and supra-segmental elements in pronunciation. Furthermore, there is an urgent need for further study in this field since challenges with pronunciation continue to exist and have been ignored in the past. Researchers may contribute to resolve this long-standing problem by doing more study into the underlying factors that lead to difficulties with pronunciation and by investigating effective treatments for learning a second language. Technology, particularly computers, will play a crucial role in satisfying the ever-changing needs of education, particularly in learning a second language. Accordingly, incorporating computer technology into educational environments is not just desirable but is becoming an increasingly vital need.

The normalisation of computer technology in education is rapidly approaching and will become a reality. Broad use of this technology will likely occur in the not-too-distant future. Nevertheless, to realise this goal, academics, educators, politicians, and technologists must collaborate to fully exploit the potential of computer-assisted learning technologies. Through the use of technology and its possibilities, one can create learning environments that are more inclusive and efficient and that adapt to the various linguistic requirements of students. In the end, the combination of cutting-edge technology and instructional methods has the potential to revolutionise language teaching and make it easier for students to acquire competency in second languages.

The study has several limitations and areas that need more investigation despite the fact that its primary objective is to give useful insights into the

effectiveness of CAPT for PELLs. The generalization of the results may be affected by methodological issues such as the size of the sample and the length of the intervention. Furthermore, in order to get a thorough grasp of the complexity of pronunciation acquisition in a variety of language situations, it is necessary to do further research on aspects such as learner motivation, individual learning styles, and sociocultural influences. Future research initiatives may fill these gaps by conducting long-term studies, making comparisons across different cultures, and developing sophisticated CAPT technologies that are specifically geared to meet the requirements of PELLs.

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