Integrating Information and Communication Technology (ICT) in Classroom Teaching for Improving English Pronunciation: An Experimental Study

Rudri Dave[*]
Usha Kaushik**
Monika Singh***

Abstract

In India, English is treated as an alien language. As a result, students need help to learn how to pronounce words correctly in foreign languages. Accurate pronunciation helps to develop an individual's social skills by building confidence to speak correctly. Although schools play a fundamental role in teaching English pronunciation, formal phonics training is given only at the pre-primary level in school. After that, the students learn the rest of the phonics by imitating their teachers or elders. The building of an inclusive atmosphere in the classroom through information and communication technology is emphasized in the new National Education Policy in 2020. It promotes the utilization of technology to aid in the improvement of pronunciation. This covers both the usage of online pronunciation programs and the tracking and evaluation of pronunciation using voice recognition tools powered by artificial intelligence. Students who utilize online dictionaries may learn more about the value of proper pronunciation and acquire the skills necessary to do so.

Furthermore, NEP 2020 emphasizes correct pronunciation in language teaching, and it has the potential to have a global impact as it encourages students to educate themselves on the importance of pronunciation in

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[*] Assistant Professor, V.M. Patel College of Management Studies, Ganpat University, Gujarat.
** Associate Professor, V.M. Patel College of Management Studies, Ganpat University, Gujarat.
*** Research Scholar, Faculty of Social Science and Humanities, V.M. Patel College of Management Studies
Ganpat University, Gujarat.

language learning. The paper analyzes the English pronunciation of undergraduate students of the Faculty of Management Studies and the Faculty of Social Science and Humanities at Ganpat University. It emphasizes the necessity of enhancing pronunciation to improve reading and speaking abilities. The study is based on pre-experiment and post-experiment analysis. Data is analyzed using various statistical tests to compare a student's pronunciation improvement before and after applying accent-enhancing procedures.

Keywords: Pronunciation, phonics, ICT, pronunciation problems, pronunciation training.

Introduction

According to Hornby (1995), pronunciation refers to how a word is said aloud and how a person says a language's words. The act of producing speech sounds, including articulation, vowel production, accent inflexion, and intonation, is referred to as pronunciation by Rebecca (1993), who also notes that pronunciation is frequently associated with the accuracy or acceptability of the speech sounds.

The Indian government's National Education Policy 2020 strongly emphasizes pronunciation. It is intended to make the Indian education system more accessible and inclusive. The National Education Policy 2020 emphasizes the importance of good pronunciation, which is essential for effective communication. The role of pronunciation in education is a crucial component of learning a language. Pronunciation is the key to being able to communicate effectively in any language. Learners need to be able to produce sounds accurately and fluently and understand the sounds of the language they are learning. Language learners often overlook the importance of pronunciation in language training. This is a mistake as pronunciation can affect the accuracy of language fluency and general intelligibility. It increases the learner's communication stability and helps develop a good understanding of the language being studied. Pronunciation refers to the way words are pronounced when speaking a language. It involves the sounds of the language, the intonation, and the manner of articulation. A good understanding of pronunciation is essential for successful communication in a language. Good pronunciation is a fundamental component of successful language acquisition and can influence a learner's ability to understand and be understood. Pronunciation is essential to language learning as it allows learners to comprehend and be understood by others. It also includes the stress intonation and rhythm of

speech. Poor pronunciation can lead to misunderstandings and communication breakdowns, which can be embarrassing and frustrating for language learners. O'Connor (1980) gives a good illustration of how vital our ears are. He says:

> "Language starts with the ear. When a baby starts to talk, he does it by hearing his mother's sounds and imitating them. If a baby is born deaf, he cannot hear these sounds and therefore cannot imitate them and will not speak."

The above often occurs to somebody who is learning English. If one cannot listen to English pronunciation well, he cannot produce it well too. English has many complex sounds and words that can be difficult for non-native speakers to pronounce correctly; in addition, English has a wide variety of accents, which can make it difficult for language learners to understand native speakers. With proper pronunciation practice, language learners can increase their confidence when speaking English and can be better understood by native speakers. This is in line with Broughton (2003), who states that the teaching of pronunciation must always be arranged in the context of using native languages to become proficient in understanding and speaking.

By focusing on pronunciation, language learners can learn more about this structure of the language and gain more insights into the native speakers use it. Furthermore, pronunciation can also help build confidence in learners as they become more comfortable speaking the language. In this paper, the importance of pronunciation in education and the various strategies and techniques that can be used to help learners improve their pronunciation are discussed. The application of the English language in India is growing. It has been increasing steadily over the last few years. However, still, it requires more attention to improve its quality as per an article by the *Ministry of Human Resource Development* on *National Education Policy 2020* that there must be a steady stream of top-notch educational and printed resources in these languages, such as textbooks, workbooks, movies, plays, poems, novels, periodicals, etc., for languages to stay current and vital. To ensure that the most recent topics and ideas can be properly discussed in these languages, dictionaries and vocabularies must undergo regular official changes that are widely publicized. Countries worldwide provide study materials, printed materials, translations of significant texts from other languages, and ongoing vocabularies for languages like English, French, German, Hebrew, Korean, and Japanese. India has remained relatively tardy in generating such learning and study

materials and dictionaries to help retain its languages as dynamic and current as possible while maintaining their purity,

Information and Communication Technology (ICT) has become an essential tool in language learning. It provides learners with various digital tools and resources to help them learn a language, such as an online dictionary, websites, tutorials, and electronic courses. ICT also allows learners to access authentic language resources, such as audio and video recordings of native speakers, and to connect with native speakers of a language through online forums. It provides more interactive, visual, and engaging ways to learn a language.

2. Literature Review

Ramashego, M., and Nel, N. (2019). provide an outline of how information and communication technologies might be used\ to help struggling readers with their phonics education. The paper covers the different ways that ICT can facilitate such training and the importance of phonics instruction for reading growth and tests. The paper makes the case that ICT can be used in several ways to increase the efficacy of phonics instruction, including by offering more interactive and engaging activities, enabling greater individualization of instruction, enabling more effective assessment, and offering opportunities for phonics skill practice in various contexts. Using software programs as an example, Winn, T. &et al. (2019) explore how technology make teaching phonemic awareness and phonics easier. Also, they cover ideas for utilizing technology to improve phonological awareness and phonics training, such as using it to offer visual and auditory signals, opportunities for practice, and assessment, and love for customized instruction.

P.G. Abbas (2016) discusses the procedures and significance of English pronunciation instruction. The analysis of teachers' roles in pronunciation instruction is another component of the paper. Some recommendations have been made to improve pronunciation. It discusses ways to improve one's capacity for precise, and efficient communication. According to Nguyen, L.T., et al. (2021), pronunciation is something that both teachers and students value highly. The study recommends that instruction is English as a foreign language includes instruction on pronunciation. Sibaja, K.M. (2019) analyses English pronunciation and concentrates on the procedures necessary to advance phonics. Also, it discusses English as a second language in India. The importance of when learning English as a foreign language is covered in Low., Ee Ling (2016). It also emphasizes how instructors overlook pronunciation because they

lack the necessary phonetic and phonological understanding. It fills in the gaps between phonetics, phonology, and pronunciation while giving readers a research-based manual on how to teach English as effectively as possible. It connects the speech processes, addresses the articulation of English speech sounds, and employs multimedia for English pronunciation. Also, it uses the most recent research on English Pronunciation as a second language, which is beneficial for anyone interested in teaching English as a second language. The lack of emphasis on pronunciation in the curriculum for EFL/ESL is discussed by Wei (2006). In this study, its significance in the curriculum has been covered.

P. G. Abbas (2011) makes several recommendations for teaching pronunciation and suggests ways to improve the effectiveness of pronunciation instruction in ESL/EFL classes. The page also offers a variety of perspectives from educators, scholars, and authors on the state of pronunciation instruction. Dalton & Seidlhofer (1994) presents the importance of Pronunciation using the characteristics of various speech sounds, stress, rhythm, syllables, intonation, etc. Also, it covers a variety of pronunciation instruction techniques. Varasarin, P. (2007) looks into how pronunciation practice and language learning techniques affect the study habits of a chosen group of English-language learners and boost their speaking self-confidence. A curriculum for teaching pronunciation to young English language learners is described by Rekowski (2020). It covers a core group of crucial pronunciation issues for young learners and focuses on assignment forms.

To enlarge the relevance of Pronunciation in language teaching methods and address native-like Pronunciation, P. G. Abbas (2017) offers a thorough assessment of some significant issues, viewpoints, and methods of English pronunciation instruction. It focuses on the idea that clear pronunciation ought to be the end goal of oral communication. The study by Shak. P., et al. (2016) is based on a thematic analysis of the sounds that students frequently mispronounce. This study suggests using familiar sounds as the subject matter when creating a pronunciation tutorial video to assist students with limited spoken language ability with their pronunciation issues in the twenty-first century. The 26 letters of the English alphabet do not necessarily denote the same phonetic sounds, according to Mary, N.N. (2014). The contrasts between British and American English dialects and several techniques for improving speaking and listening abilities are also covered. By simulating spelling variance, Fackrell, J. & Skut (2004) aim to expand the scope of an existing name pronunciation dictionary. The study explores how pronunciation issues arise when using out-of-vocabulary

(OOV) terms in automated contact centres and in-car navigation systems. The significance, objectives, methods, and effects of the involvement of EFL teachers in the enhancement of Pronunciation are discussed by P. G. Abbas (2016).

Bakar, M.A., et al. (2019) talk about the evolution of programming that employs visual output techniques. Constructivism and the theory of cognitive load were both used in the development of this program. The study concludes that the module is appropriate for usage in higher education settings where programming is taught and learned. Image Word Inductive Model is discussed in Jiang, X., & Perkins' (2013) systematic experimental investigation. By introducing new words and images, the paper explores the Picture Word Inductive Model from the viewpoint of Bruner's learning structures and the cognitive load theory. A potent strategy for maximizing language learning and teaching, Task-based language teaching was emphasized by Hismanoglu, M., and Hismanoglu, S. (2011), who also described its advantages and difficulties. Gupta, C.D & KPN (2012) Haridas contributes ideas on potential ways to develop and enhance the educational environment in schools in Bihar to the education component of the ICT strategy and school education policy of the Government of Bihar. The purpose of the study is to highlight how ICT may be used to enhance school education while also integrating pedagogical techniques that consider the social restrictions of schooling in Bihar and compare them to the outcomes and implications in other regions of India.

In two public elementary schools, Mphahlele, R., and Nel, N. (2019) investigate using ICTs as a support method for students who are having trouble reading. It examines how ICT helps pupils who have trouble reading. The development of kindergarten pupils' phonemic awareness through technology-based interventions is covered by Brown, Je'Naya D. (2019). A description of the fundamental challenges that must be resolved before any language testing activities can begin can be found in Bachman, F. (1995). The fundamental ideas of effective foreign language teaching are covered in detail by Broughton, G. & et al. (1980) in their discussion of a wide range of teaching issues. Kelly, G. (2001) provides several tasks to demonstrate how to incorporate pronunciation practice with managing grammar and lexis to aid instructors in gaining theoretical knowledge. To improve teaching and learning, assessment, planning, and administration of education, multidisciplinary research, and innovation are encouraged under the National Education Policy, according to Alam (A).

Research Gap

Above all, literature reviews, and reading of several articles, books, reports, and websites have been done to analyze the gap in learning pronunciation through the application of information and communication technology. The comprehensive study of the literature has facilitated an understanding of the gap and has applied sufficient ideas to study the role of ICT in enhancing Pronunciation.

3. Background of the Study

Pronunciation in NEP 2020

The National Education Policy 2020 emphasizes the need to develop a communicative language teaching approach that focuses on the development of pronunciation along with other language skills such as grammar, vocabulary comprehension, and communication. It also causes the implementation of pronunciation drills and activities to help students improve their pronunciation. Besides, it suggests the introduction of digital learning platforms to help students learn and practice pronunciation.

The National Education Policy 2020 also encourages the use of technology to facilitate pronunciation development. This includes the use of artificial intelligence-based voice recognition tools to track and assess pronunciation, along with the use of online pronunciation programs.

Using such tools and programs can help students become more aware of the importance of pronunciation and provide them with the tools to improve their pronunciation. The National Education Policy 2020 also calls for the creation of an inclusive environment in the classroom to promote the acceptance of different accents and varieties of languages. This will help to create an atmosphere of respect for foreign accents and provide a platform for everyone to express themselves.

Reasons for Issues with Pronunciation in the English Language

- **History and Development of the English Language:** The history of the English language is extensive and intricate, which ~~that~~ has led to its current state. English amalgamates many languages, including Latin, Anglo-Saxon, and French. This mixture of languages has resulted in a various pronunciations and spellings that can confuse many people. Additionally, the language has evolved, with new word meanings and pronunciation being added all the time. This makes it challenging to keep up with the changing language and can lead to problems in pronunciation.

- **Improper Pronunciation:** Many people struggle with pronunciation because of improper usage. For example, some people correctly substitute one sound for another, such as using a *"th"* sound instead of a *"d"* sound. This can lead to confusion and difficulty in understanding the speaker. Some people may miss pronouncing words due to the influence of their native language.

- **Regional Dialect:** Another cause of confusion is using regional dialects. Different areas of the world have their unique dialects, which can lead to pronunciation problems. For example, the word *"aunt"* is pronounced as *"ahnt",* While in other areas it is pronounced as *"ant"*. This can make a difficult for people to understand each other, as they may be using different pronunciations for the same word.

- **Difficulties of Learning English as a Second Language:** Those learning English as a second language can be challenging. Those who are learning the language have to learn not only the grammar and vocabulary but also the pronunciation. This can be difficult for many people, as the pronunciation of English words can be very different from their native language. Moreover, many people may not have access to native English speakers, making it difficult to learn proper pronunciation.

Pronunciation: Strategies and Techniques

Various strategies and techniques can help learners improve their pronunciation, including listening, limitation, and practice activities.

Listening activities can help learners become familiar with the sounds and intonation of the language and improve their understanding of the language. Imitation activities can help learners improve their pronunciation as they can practice producing the sounds of the language. Practice activities help learners become more confident in it as they can practice their pronunciation in different contexts.

Role of Information and Communication Technology (ICT) in Learning and Improving Pronunciation

Information and Communication Technology has greatly impacted how children learn phonics and spelling. Over the years, technology has revolutionized how children learn with interactive activities, visuals, and audio-visual technology. ICT can provide an interactive and engaging

environment for phonics and spelling lessons, which can help improve students' learning outcomes. Information and communication technology use in language acquisition has become increasingly important in recent years. The range of ICTs available to language learners is expanding rapidly, and they offer a range of advantages and disadvantages for language learning. ICTs have the potential to provide language learners with a wide range of tools to facilitate their language learning. Such tools can range from Computer-Assisted Language Learning (CALL) programs to online language learning platforms, to mobile applications. These tools can offer several advantages for language learning, such as increased access to learning materials, enhanced interactivity, greater autonomy, and improved motivation.

Information communication systems, such as computers and phones, can play a role in improving pronunciation by providing access to various tools and resources that can help to practice and improve pronunciation.

Some examples of information communication systems that can be used for this purpose include:

Speech Recognition Software: Speech recognition software can help practice pronunciation by listening to speakers' spoken words and providing feedback on their accents and pronunciation.

Language Learning Apps: The world of technology has opened a myriad of possibilities for language learners. English language learning apps are a great way for learners to learn the language. They provide an interactive and engaging learning experience that is tailored to the learner's level and specific learning needs. Unlike traditional classroom settings, language learning apps offer a personalized approach to learning. Apps provide a variety of activities and games to help learners practice and expand their English vocabulary and speaking skills.

Online Dictionaries: Online dictionaries often provide audio recordings of words pronounced by native speakers, which can be a valuable resource for learning how to pronounce words correctly. They are an invaluable resource for students of all levels of language proficiency, from beginning learners to advanced speakers.

Video Conferencing Tools: Video conferencing tools have become increasingly popular in recent years for learning the language. They allow students to interact with native speakers in real-time, enhancing their language-learning experience. It provides students with valuable insight

into a particular language's culture and customs and allows them to learn more than just the language itself. It gives students access to different accents, dialects, and cultural expressions of the language they are learning. They provide the chance to practice their language skills in real-time conversations. Students can access audio and video recordings of native speakers, study materials, and even virtual classrooms. These resources can help students learn more quickly and effectively.

The potential for destruction and the lack of human interaction are two significant downsides of using ICTs for language acquisition. Teachers should be innovative to help their pupils understandably communicate in foreign languages. This will make the class more fun and engaging. As a result, the pupils are eager and driven to learn. The researcher employs text-to-speech software as a tool to help students with their pronunciation in the hopes that this will increase their engagement with the teaching-learning process. It will make it simpler for them to master English pronunciation.

Theoretical foundations for the use of ICT in pronunciation teaching

The conceptual underpinnings of ICT use in pronunciation teaching are based on the following principles:

1) Constructivism: It is an educational theory emphasising the importance of learners and individual experience and understanding when it comes to learning. Constructivism suggests that learners should actively participate in the learning process and that the use of ICT can be effective in this regard. With the use of ICT, learners can interact with the teaching materials , and it can also provide feedback on pronunciation.

2) Cognitive Load Theory: It suggests that learners should be given tasks appropriate to their knowledge and understanding level to avoid cognitive overload. With the ICT aid, students can be given appropriate assignments for their comprehension level. Which can help with pronunciation instruction.

3) Task-Based Language Teaching (TBLT): Task-Based Language Teaching suggests that learners should be given tasks relevant to their needs and that using ICT can be effective in this regard. ICT can provide learners with tasks adapted to their individual needs and can help them become more aware of their pronunciation errors.

The impact of ICT on student's learning outcomes

ICT can greatly facilitate phonics and spelling learning when used in the classroom. It can provide interactive activities and visual ads such as videos and games that can help students better understand phonics and spelling concepts.

ICT can also provide audio-visual technology, such as talking books and speech recognition software, to help students learn how to read and spell. It can create a more engaging and stimulating learning environment for students. With interactive activities and visual aids, students can stay more focused and motivated. This can increase the engagement with material and help them to understand the concepts.

Additionally, ICT can help reduce the time it takes for students to learn phonics and spelling. ICT can help to improve student learning outcomes. For example, using interactive activities and visual ads can help make the material more engaging and easier to understand. Furthermore, audio-visual technology can reinforce the concepts of improving student retention. ICT can help reduce the time it takes for students to learn phonics and spelling. With the use of interactive activities and visual aids, students can stay more focused and motivated, and they can progress through the material at a faster rate. ICT can help to reduce the amount of teacher supervision needed during phonics and spelling lessons. With the interactive activities and visual aids, a teacher can spend less time explaining the material and more time helping students with their learning.

4. Problem Statement

The researcher developed the following research topic in light of the previously mentioned background:

How will the Online Dictionary help enhance the students' pronunciation of the undergraduate students of Ganpat University, Faculty of Social Sciences and Humanities, and Faculty of Management?

5. Research Objective

Based on the aforementioned problem statement, this study aims to determine whether using an online dictionary can help undergraduate

students at Ganpat University's Faculty of Social Sciences and Humanities pronounce words more clearly.

6. Significance of the Study

A few expected advantages of this research are as follows:

- The benefits of this research are anticipated to include:

- The result of this research can be used as a guide by other researchers to undertake another research that is connected to it.

- The findings of this study can help English teachers learn new information and improve their methods for teaching English using ICT, particularly pronunciation.

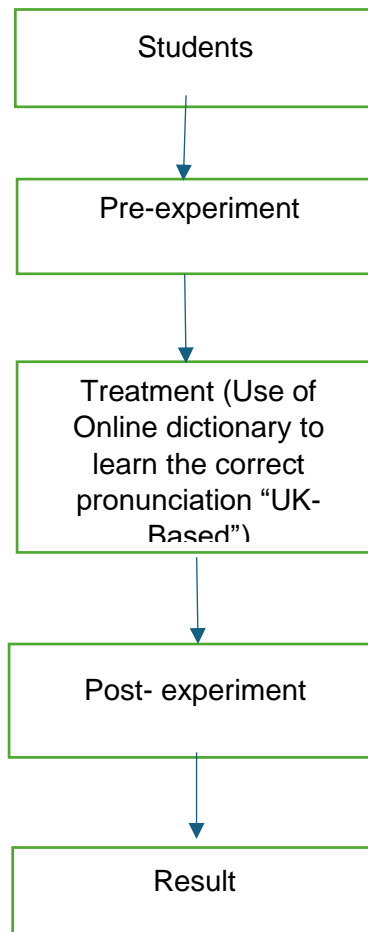- It may be a fun way for the pupils to learn pronunciation.

7. Research Methodology

The current study was carried out to compare the pronunciation of students from different fields. It was aimed to identify whether involving Information and Communication Technology in everyday classroom teaching will play a significant role.

The study involved undergraduates from the faculties of social science and humanities and management studies. This study produced 104 responses, but it could only include 87 undergraduate students because of incomplete data.

A convenience sampling method was applied among the first year of undergraduate students. The following elements were taken into account when creating the questionnaire using Google Form: the region, whether rural or urban, the language of instruction (English, Hindi, or Gujarati), and the parents' English language skills. The pupils were given a list of 50 words in the manner of the required questionnaire. The words involved the pronunciation of "ed," which is typically pronounced as "T" or "D," silent letters, 'B' and 'K' pronunciation of 'C' as 'S' or 'K', pronunciation of 'G' words pronounce as 'J' and 'G', pronunciation of 'S' as 'Z' or 'SH', pronunciation of 'T' as 'SH' or 'CH' or 'TH' or 'D' and some unusual spelling. These variables were chosen to examine how ICT affects an individual's pronunciation abilities. Incorrect pronunciations were noted in this form.

7.1 Conceptual Framework

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┌─────────────────────┐
│      Students       │
└─────────────────────┘
           │
           ▼
┌─────────────────────┐
│   Pre-experiment    │
└─────────────────────┘
           │
           ▼
┌─────────────────────┐
│  Treatment (Use of  │
│ Online dictionary to│
│  learn the correct  │
│ pronunciation "UK-  │
│      Based")        │
└─────────────────────┘
           │
           ▼
┌─────────────────────┐
│   Post- experiment  │
└─────────────────────┘
           │
           ▼
┌─────────────────────┐
│       Result        │
└─────────────────────┘
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7.2 Design

The researcher adopted a quantitative methodology to examine the data for this study. The researcher employed a pre- and post-experiment strategy to evaluate pupils' pronunciation skills. A statistical technique employed in the study was the Wilcoxon Signed Rank test. A nonparametric test was chosen since the data gathered for this study was not normally distributed. A nonparametric test was opted for. The subject was selected based on the convenience sampling method. Participants were first-year students of the faculty of social science and humanities and the faculty of

management studies. This research is divided into two parts: pre-experiment and post-experiment. Both outcomes were documented, observed, and analyzed. To assess their pronunciation abilities, students were given a set of 50 words one at a time. Any inaccurate pronunciations were noted on the form. Then, they were provided access to the Cambridge "UK-based" pronunciation online dictionary, where students had to listen to and learn the correct pronunciation of the word.

Following that, the same student's pronunciation was assessed. Students who had gone through the pre-experiment process and referred to the assigned online dictionary have gone through the same procedure again, and mispronounced words were noted in the form. In this study, researchers employed Excel, SPSS software for the analysis, and Tableau software to create the visualization impact.

7.3 Factors of the Research

In this research, we have considered the following factors for study: Class, Area, Medium, and Mother and Father's English Proficiency.

- The class was differentiated into the Faculty of Management Studies and the Social Science and Humanities.
- The area was divided into Rural and Urban.
- The medium was divided into English, Gujarati, and Hindi.
- Mother and Father's English proficiency were rated on a scale of 1 to 5. 5 being excellent and 1 being poor.

7.4 Data Collection Procedure

The questionnaire was created using Google Forms. The following factors were considered: The area, whether rural or urban, the medium of study (English, Hindi, or Gujarati), and the English proficiency of the mother and father. A list of 50 words was identified and given to the students in the prescribed questionnaire format. The researcher individually collected the data, calling the students one by one, filling in all their information, and hearing the pronunciation of each listed 50 words in the

form. The researcher had ticked all incorrectly pronounced words in the form.

Following that, they were given the Cambridge "UK-based" pronunciation dictionary, where they needed to listen and learn the word's correct pronunciation. Following that, the same student's pronunciation was evaluated and who had gone through the pre-experiment process was referred to the assigned online dictionary. The same procedure was repeated, and incorrectly pronounced words were noted in the form.

7.5 Research Hypotheses

The research hypothesis has been formulated as follows:

Null hypothesis (Ho): There is no significant difference between the Pre-experiment result and the post-experiment result for integrating ICT in classroom teaching.

Vs.

Alternative hypothesis (Ha): There is a significant difference between the Pre-and post- experiment results for integrating ICT in classroom teaching.

7.6 Research Instrument

The pronunciation experiment is the primary tool of this study. It was used in both the pre-and post-experiment parts. The pre-experiment, which was undertaken during the first meeting, was done to determine the prior knowledge of the students' pronunciation. The second meeting was held to propose using an online dictionary to enhance pronunciation, and the final meeting (following the experiment) was held to determine whether pronunciation was enhanced using the online dictionary.

8. Results

The researcher employed Tableau and SPSS software to analyze and visualize the gathered data. Following is the SPSS output:

Table 8.1.1 Frequency

Statistics

		Name	Class	Medium	Area	Mother's English Proficiency	Father's English Proficiency	Pre-Test	Post-Test
N	Valid	87	87	87	87	87	87	87	87
	Missing	0	0	0	0	0	0	0	0

Class

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	FSSH	38	43.7	43.7	43.7
	Management Studies	49	56.3	56.3	100.0
	Total	87	100.0	100.0	

Table 8.1.2 Class-wise frequency table.

Medium

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	English	62	71.3	71.3	71.3
	Gujarati	23	26.4	26.4	97.7
	Hindi	2	2.3	2.3	100.0
	Total	87	100.0	100.0	

Table 8.1.3 Class-wise frequency table.

Area

Table 8.1.4 Area-wise frequency table.

Mother's English Proficiency

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	26	29.9	29.9	29.9
	2.00	27	31.0	31.0	60.9
	3.00	19	21.8	21.8	82.8
	4.00	8	9.2	9.2	92.0
	5.00	7	8.0	8.0	100.0
	Total	87	100.0	100.0	

Table 8.1.5 Mother's English Proficiency rating wise frequency table.

Father's English Proficiency

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	9	10.3	10.3	10.3
	2.00	19	21.8	21.8	32.2
	3.00	31	35.6	35.6	67.8
	4.00	17	19.5	19.5	87.4
	5.00	11	12.6	12.6	100.0
	Total	87	100.0	100.0	

Table 8.1.6 Father's English Proficiency rating wise frequency table.

The above table shows the frequency for the class, medium, area, and mother and father's English proficiency. In the pre-experiment, the average number of incorrect words pronounced was 13.2989, with a maximum of 44 and a minimum of 1. After integrating information and communication technology into the classroom, the average number of incorrectly pronounced words was 6.2759, representing a nearly 52.81% decrease from the pre-experiment results, with a maximum of 39 and a minimum of 0 (zero).

The paired t-test was supposed to be used for the comparison of the outcome of the pre-and post-experiment. Before, applying the paired t-test,

a test of normality was used to identify if the data was normally distributed or not. The following is the result of the testing of normality:

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pre-Test	.160	87	.000	.872	87	.000
Post-Test	.183	87	.000	.780	87	.000

8.2.1 Table for the test of normality

As the sample size is greater than 50, we must rely on the Kolmogorov-Smirnov test, but the significance value is less than 0.05, indicating that the data is not normally distributed. So, we must use the nonparametric test; otherwise, we can use the paired t-test after removing the outliers. However, no outliers were removed from this study to obtain a significant result, and a nonparametric test was used.

Wilcoxon's signed rank test was used for the comparison of pre and post-test results:

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum	25th	Percentiles 50th (Median)	75th
Pre-test	87	13.30	9.369	1	44	7.00	10.00	18.00
Post-test	87	6.28	6.634	0	39	2.00	4.00	9.00

8.3.1 Table for descriptive statistics.

Ranks

		N	Mean Rank	Sum of Ranks
Post-test - Pre-test	Negative Ranks	79[a]	43.58	3443.00
	Positive Ranks	4[b]	10.75	43.00
	Ties	4[c]		
	Total	87		

8.3.2 Table for ranks given to pre and post-experiment.

a. Post-Experiment < Pre- Experiment
b. Post-Experiment >Pre- Experiment

c Post-Experiment =Pre- Experiment

Here, the aforementioned table demonstrates that:

a. 79 participants have more inappropriately pronounced words in the pre-experiment than compared to the post-experiment.
b. 4 participants have a more incorrectly pronounced word in post-experiment than as compared to pre-experiment.
c. In 4 Participants' performances no change was found in their pre and post-experiment count.

Test Statistics

	Post-test - Pre-test
Z	-7.724[b]
Asymp. Sig. (2-tailed)	.000

a. Wilcoxon Signed Ranks Test
b. Based on positive ranks.

8.3.3 Table for test statistics

Based on the above table, the p-value is 0.000, which is less than 0.05, which shows us the significant result in the pre-experiment and post-experiment results.

This implies that the Pre-experiment and Post-experiment mark results differ significantly, which means that Integrating Information and Communication Technology in classroom teaching has positively effects on the students. In addition, the researcher is doing an individual percentage analysis and creating visualization with the help of the Tableau software:
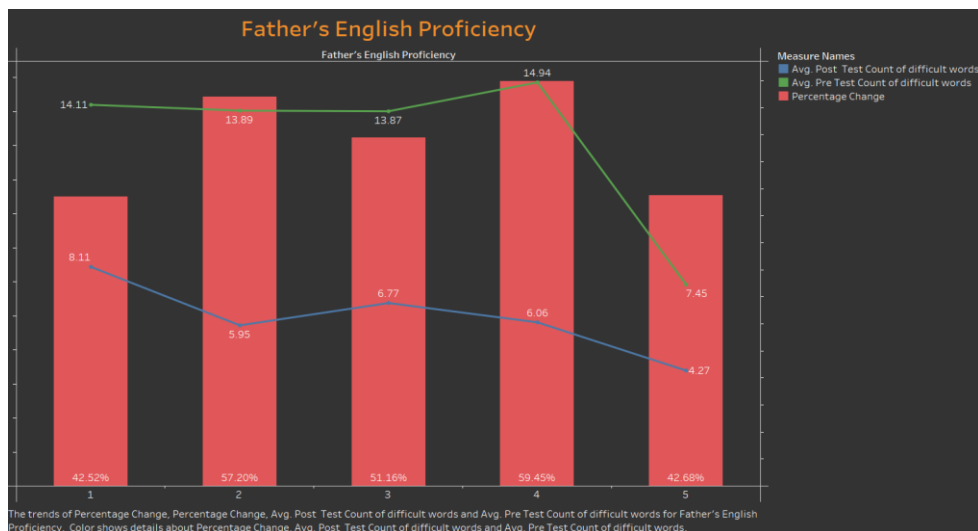
Table 8.4.1 Rating of Father's English Proficiency.

Table 8.4.1, shows the rating of the father's English proficiency with that of the average pre and post-count of incorrect words pronounced by the participants. The experiment's pre-average count is indicated by the green line, the blue line indicates the experiment's post-average count. Looking at the statistics, it becomes clear that students who gave a 4 had an improvement of 59.45%, indicating that the whole home environment greatly impacts students' lives.
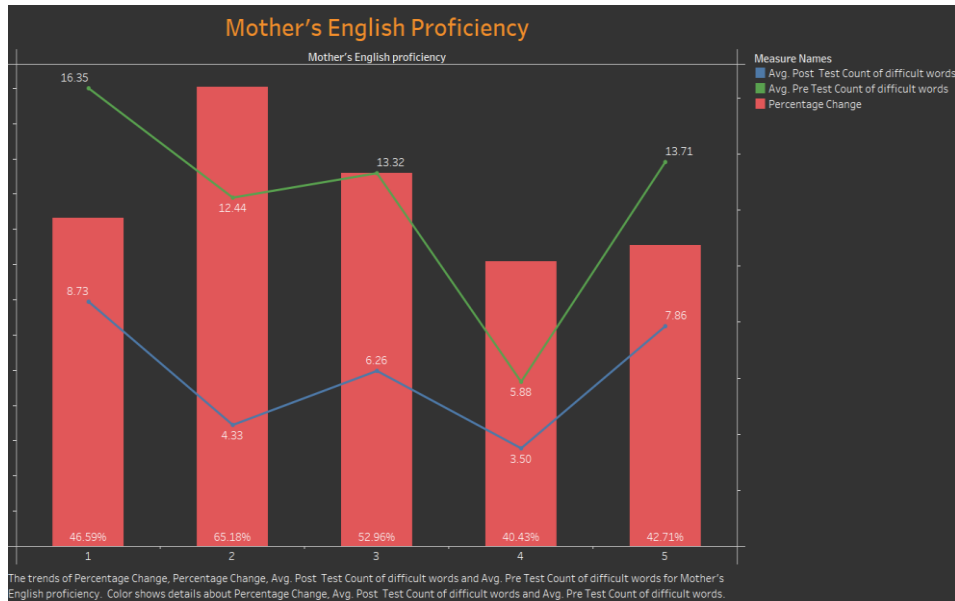
Table 8.4.2 Rating of Mother's English Proficiency.

The above table 8.4.2, shows the mother's English proficiency rating with that of average pre and post-count of incorrect words pronounced by the participants. The blue line depicts the experiment's post-average count, while the green line represents the experiment's pre-average count. According to the statistics, the average number of incorrect words pronounced for those who received ratings of 4 and 5 improved by almost 50%.
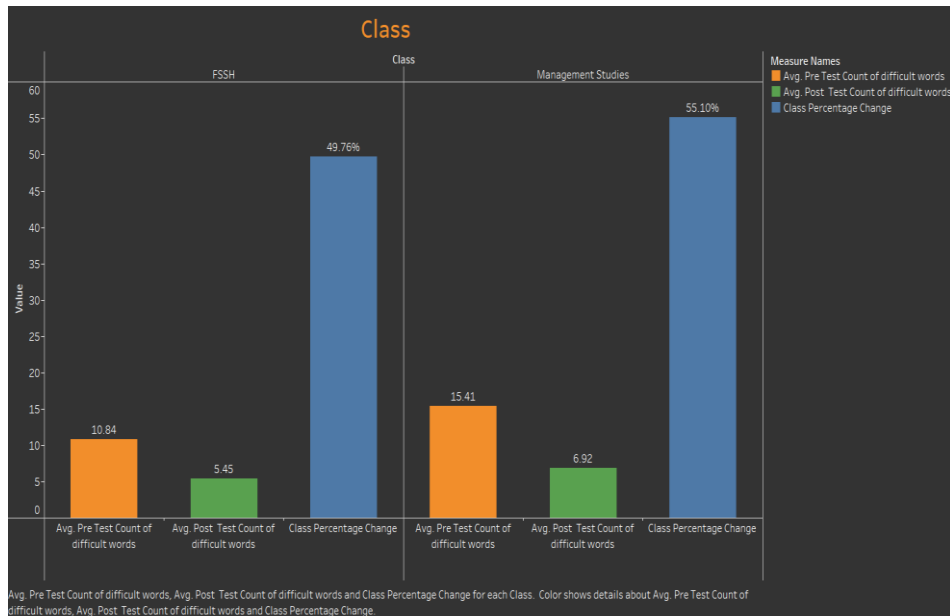
Table 8.4.3 Class-wise Comparison.

Above table 8.4.3, the class-wise comparison is shown. The collected data, compares two departments, i.e., the Faculty of Social Science and Humanities and the Faculty of Management Studies. FMS has a greater improvement of 55% from their average pre-experiment count, and FSSH also has a great improvement of almost 50 % from their average pre-experiment count. This shows the positive impact of Information and Communication Technology in everyday classroom teaching.
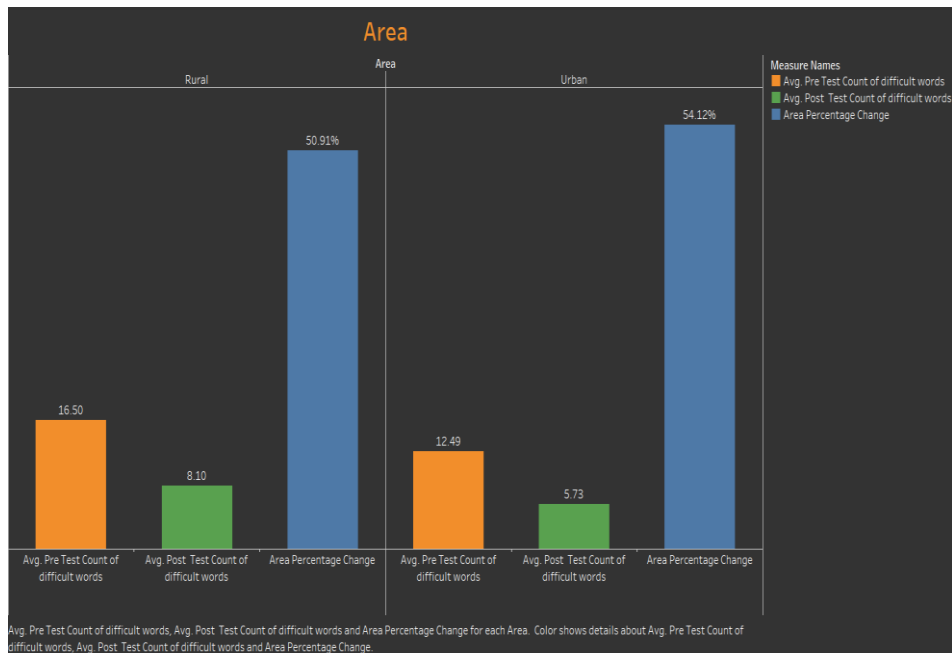
Table 8.4.4 Area-wise Comparison.

Table 8.4.4, shows the area-wise comparison of pre and post-experiment, incorrectly pronounced words. In a rural area, there was an average of 16.50 incorrect pronounced words in the pre-experiment, and they had improved to the average of 8.10 incorrect pronounced words in the post-experiment, which shows an improvement of almost 51% in the rural area. This suggests that ICT plays a significant role in rural areas as well. In contrast, the average number of incorrectly pronounced words in the urban region decreased from 12.49 on average in the pre-experiment to 5.73 in the post-experiment, showing an almost 54% improvement.
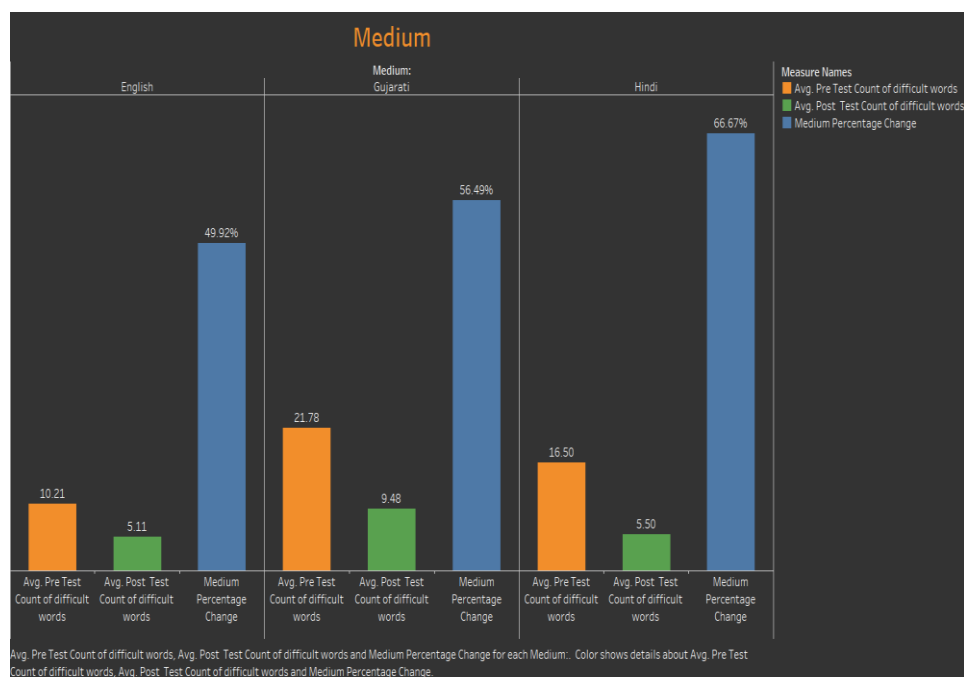
Table 8.4.5 Medium-wise Comparison.

Table 8.4.5, shows the medium-wise comparison. In the present study, students are from the English, Hindi, and Gujarati mediums. The above graph shows an improvement of almost 50 %, 56%, and 67% for the English, Gujarati, and Hindi respectively.

Class	Medium:	Area	Avg. Pre Test Count of difficult words	Avg. Post Test Count of difficult words	Percentage Change
FSSH	English	Rural	7.75	1.75	77.42
		Urban	9.25	4.46	51.74
	Gujarati	Rural	22.33	16.00	28.36
		Urban	18.33	9.00	50.91
Management Studies	English	Rural	13.89	8.78	36.80
		Urban	10.38	5.05	51.38
	Gujarati	Rural	26.75	7.00	73.83
		Urban	20.92	8.85	57.72
	Hindi	Urban	16.50	5.50	66.67

Avg. Pre Test Count of difficult words, Avg. Post Test Count of difficult words and Percentage Change broken down by Class, Medium: and Area.

Table 8.4.6 Overall Comparison.

In the above table 8.4.6, the Overall comparison is shown. The aforementioned table shows that ICT is important for both rural and urban students who study Gujarati and those who study in metropolitan settings and use English as their primary medium of instruction.

9. Discussion

The actual observations gathered through treatment and statistical analysis demonstrate that there is a significant difference between the pre-experiment and post-experiment performances of the experimental groups this discussion outlines the findings of the hypothesis.

The hypothesis says that: There is no significant difference between the Pre- and post-experiment results. (There is no effect of integrating ICT in classroom teaching).

Analysis of results supported the rejection of the hypothesis and demonstrated that the usage of the online dictionary in classroom teaching had a good impact on the under-graduated students.

The means of the experimental groups have dramatically changed, with the pre-questioning group's pre-experiment values changing from (x=13.30, SD=9.369) to (x=6.28, SD=6.634) in the post-experiment. We can see the improvement in the pronunciation of undergraduate students by comparing the average count of words that were improperly pronounced before and after the experiment. Also, the p-value is less than 0.05, suggesting the result is significant.

Undergraduate students benefit from using information and communication technology in the classroom. Also, it has demonstrated that the research study's components, which were taken into account, also had a big impact. From the visualization, is evident that ICT is significantly improves student outcomes in both urban and rural areas, by almost more than 50%. The study's results have also demonstrated the importance of the home environment on a student's academic success.

11. Conclusion

The role of pronunciation in education is essential for successful language acquisition Pronunciation can help learners to understand and be understood by others as well as help them in other areas of language learning such as reading and writing. Good pronunciation helps students to develop their language proficiency and enhances their confidence in spoken communication. Moreover, it is essential for the listener to properly understand the language. To improve pronunciation, it is essential to listen to native English speakers practice phonetic symbols and, read aloud, and use an online dictionary. With the proper techniques and practice pronunciation can be improved even without taking formal phonetics training by using an online dictionary and imitating the pronunciation; hence, the difficulty in understanding can be reduced.

12. Limitation and Scope for the Further Research

The study has several limitations, which might pave the way for additional research in the future. First, due to a geographical restriction, this survey has only gathered responses from undergraduate students at Ganpat University's Faculty of Management Studies and Faculty of Social Sciences and Humanities. In the future, researchers should make an effort to examine more geographical regions to improve the generality of their findings. Second, because the study's smaller sample size, future research should consider including additional samples to produce accurate results. Finally, researchers can use more words and several ICT tools in the future.

References:

1. Arif F, M. (2015). *Improving the Pronunciation Skill of the Tenth Grade Students of SMA 1 Gebog Kudus in Academic Year 2014/2015 through Homophones Intersperse. Skripsi:* English Education Department, Teacher Training and Education Faculty, Muria Kudus University.

2. Bachman, L., R. (1990). A fundamental consideration in language testing. Oxford: Oxford University Press.

3. Bakar, M.A., & et al. (2019). The Development of a Visual Output Approach for Programming via the Application of Cognitive Load Theory and Constructivism. IJACSA. 10(11). https://doi.org/10.14569/IJACSA.2019.0101142

4. Broughton, G. E. (2003). Teaching English as a foreign language (Adobe eReader Format ed.). USA: Taylor & Francis e-Library.

5. Celce-Murcia, M. & Olshtain, E. (2000). Discourse and context in language teaching: A guide for language teachers. Cambridge: Cambridge University Press.

6. Celce-Murcia, M. &Olshtain, E. (2000). Discourse and context in language teaching: A guide for language teachers. Cambridge: Cambridge University Press.

7. Dalton C. & Seidlhofer B. (2001) Pronunciation. New York: Oxford University Press

8. Fackrell, J. & Skut, W. (2004). IMPROVING PRONUNCIATION DICTIONARY COVERAGE OF NAMES BY MODELLING SPELLING VARIATION.

9. Fraser, H. (2000a). Coordinating improvements in pronunciation teaching for adult learners of English as a second language. Canberra: DETYA (Australia National Training Authority Adult Literacy Project) Retrieved from http://www-personal.une.edu.au/~hfraser/docs/HF_ANTA_REPORT.pdf

10. Government of India, Ministry of Ministry of Human Resource Development, National Education Policy. (2020)

11. Gupta, C.D. & KPN, Haridas. (2012) Role of ICT in Improving the Quality of School Education in Bihar. IGC. https://www.theigc.org/sites/default/files/2014/09/Das-Gupta-KPN-2012-Working-Paper.pdf

12. Hismanoglu, M. & Hismanoglu, S. (2011). Task-based language teaching: what every EFL teacher should do. ScienceDirect. https://doi.org/10.1016/j.sbspro.2011.03.049

13. Hornby, A.S., (1995) Oxford Advanced Learner's Dictionary, Fifth Edition, Oxford: Oxford University Press.

14. Jiang, X., & Perkins, K (2013). A Conceptual Paper on the Application of the Picture Word Inductive Model Using Bruner's Constructivist View of Learning and the Cognitive Load Theory. Interdisciplinary Journal of Teaching and Learning. Spring. 3(1).

15. Kelly, G. (2001). How to teach pronunciation (2nd ed.). Malaysia: Longman.

16. Low., Ee Ling. (2016). Pronunciation of English as an International language. Routledge.

17. Mary, N.N. (2014). THE DIFFICULTIES WITH THE PRONUNCIATION OF ENGLISH LANGUAGE IN INDIA. IJRAR, 1(1), 333-341. https://www.ijrar.org/papers/IJRAR19D1687.pdf

18. Mphahlele, R. & Nel, N. Information communication technology as a support strategy for learners experiencing reading difficulties (2019), Per Linguam, 34(2), 1-13. https://doi.org/10.5785/34-2-807

19. Nguyen, L.T., et al (2021). Teacher's and Learner's Beliefs about Pronunciation Instruction in Tertiary English as a Foreign Language Education. Frontiers in Psychology, 12, 1-11. https://doi.org/10.3389/fpsyg.2021.739842

20. O Connor. J.D. (1980) Better English Pronunciation. 2nd. ed. Cambridge: Cambridge University Press.

21. P. G., Abbas & Sabouri, N.B. (2016). The Role of EFL Teachers in improving EFL Learners' English Pronunciation. Journal of Language Teaching and Research, 1(5), 967-972. https://dx.doi.org/10.17507/jltr.0705.18

22. P. G., Abbas (2011). A Study on the Situation of Pronunciation Instruction in ESL/EFL Classrooms, 1(1), 1-15. https://doi.org/10.5296/se.vlil.924

23. P. G., Abbas. (2017)   English Pronunciation Instruction: Views and Recommendations. Journal of Language Teaching and Research, 8(6), 1249-1255. https://dx.doi.org/10.17507/jltr.0806.30

24. P. G., Abbas. English Pronunciation Instruction: A Literature Review (2016), International Journal of Research in English Education, 1(1), 1-6 https://ijreeonline.com/article-1-21-en.html

25. Rekowski, A.B.V. (2020) An empirical investigation of pronunciation problems of young learners of English as a foreign language-identification and remedial strategies. (Doctoral dissertation, University of Sheffield) https://etheses.whiterose.ac.uk/27857/1/PhD_vonRekowski_080239961.pdf

26. Riswanto & Haryanto, E. (2012), Improving Students' Pronunciation through Communicative Drilling Technique at Senior High School (SMA) 07 South Bengkulu, Indonesia, International Journal of Humanities and Social Science, 2(21), 82-87.

27. Riswanto&Haryanto, E. (2012), Improving Students' Pronunciation through Communicative Drilling Technique at Senior High School (SMA) 07 South Bengkulu, Indonesia, International Journal of Humanities and Social Science, 2(21), 82-87.

28. Shak. P., et al (2016) Pronunciation Problems: A Case Study on English Pronunciation Errors of Low Proficient Students. IJLEAL, 4, 25-35. https://ijleal.ump.edu.my

29. Sibaja, K.M. (2019). English Pronunciation Proficiency. https://doi.org/10.13140/rg.2.2.17486.92487

30. Swan, M., & Smith, B. (2019). Learner English: A teacher's guide to interference and other problems. Cambridge University Press.

31. Varasarin, P. (2007) An Action Research Study of Pronunciation Training, Language Learning Strategies and Speaking Confidence. https://vuir.vu.edu.au/1437/

32. Wei, M. A (2006). A Literature review on strategies for teaching pronunciation. https://files.eric.ed.gov/fulltext/ED491566.pdf

33. Winn, T. &et al. (2019). The Efficacy of a Computer Program for Increasing Phonomic Awareness and Decoding Skills in a Primary School Setting for Children with Reading Difficulties. AJTE. 45. 1-23. https://doi.org/10.14221/ajte.202v46n12.1

34. https://statistics.laerd.com/spss-tutorials/wilcoxon-signed-rank-test-using-spss-statistics.php