

# Improving L2 Pronunciation with AI-Enhanced Narratives: Investigating Unfamiliar Arabic Contrastive Sounds

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## Abstract:

The study investigated the efficacy of integrating AI-enhanced narratives to enhancing the pronunciation of unfamiliar Arabic contrastive sounds among non-native speakers. It focused on sounds like /θ/ and /ð/, which pose challenges for learners from diverse linguistic backgrounds. A quasi-experimental study was conducted at Mansoura University, Egypt, during the 2023-2024 academic year, involving 44 non-native Arabic learners divided into experimental and control groups. Results showed significant improvements in the experimental group's pronunciation competence compared to the control group, as evidenced by higher scores in identification, production, and combined pronunciation. Statistical analysis indicated highly significant differences between the groups ( $p < 0.01$ ), with an effect size of approximately 0.5. These findings underscore the effectiveness of AI-enhanced narratives in improving pronunciation among non-native speakers, emphasizing its value in language learning.

## Keywords:

L2 Pronunciation - AI-Enhanced Narratives -  
Unfamiliar Contrastive Sounds

## I. Introduction:

Language pronunciation plays a crucial role in language acquisition. In the early developmental stages, individuals naturally possess the ability to discern and articulate the diverse range of phonetic sounds present in human languages [1].

As individuals mature and become fluent in their native language (L1), they adjust to its distinct phonetic features, resulting in a gradual decline in their ability to differentiate and accurately replicate sounds not present in their mother tongue [2].

Pronouncing a foreign language becomes more challenging with age, often demanding thorough training. Inadequate proficiency frequently discourages language learners from speaking the foreign language, as they fear facing criticism or being stigmatized due to their linguistic shortcomings and limitations [3].

This challenge emphasizes why researchers are dedicated to tackling the difficulties learners encounter in mastering the pronunciation of a second language (L2), particularly in conversational interactions, speech delivery, and presentations. In these situations, mispronunciations can lead to misunderstandings and pose significant hurdles to effective language acquisition and communication.

This challenge becomes especially notable when analyzing languages with unique phonetic characteristics, such as Arabic. Arabic boasts a diverse array of consonants, and prior research on acquiring Arabic as a foreign language has shed light on the challenges associated with pronouncing different Arabic consonants, including dental, guttural, and emphatic consonants, which may not have equivalents in many languages spoken worldwide [4], [5], [6].

Within Arabic consonants, there are unfamiliar contrastive sounds that differ from those in the learner's native language. These Arabic sounds form contrasting pairs within the language, shaping distinct word meanings. The term "contrastive" underscores their importance in creating clear distinctions between word meanings.

In Arabic, several contrastive consonant sounds may be unfamiliar to speakers of other languages. These sounds play a crucial role in distinguishing between words, similar to how different sounds in English can alter word meanings (e.g., "pat" versus "bat"). For instance, consider the Arabic contrastive sounds /θ/ (th) and /s/ as in the words لَبِثَ (labitha) (to stay) and لَبِيسَ (labisa) (to wear). This example illustrates how the distinction between these contrastive consonant sounds can change the meaning of words in Arabic.

The results show that unfamiliar Arabic contrastive sounds are difficult for native English speakers to discriminate. Mastering these sounds is crucial for non-native speakers to communicate effectively and accurately in the language [7].

Furthermore, the challenge becomes more pronounced for non-native Arabic learners whose native languages, such as Kurdish, Indonesian, Malay, and Mandarin Chinese, lack Arabic consonants like /θ/ and /ð/. This limitation presents diverse avenues for empirical research in the field of second language (L2) pronunciation learning among non-native Arabic learners [8].

Educators face the challenge of helping learners overcome differences between their native language and the target language. One significant aspect of this is the contrastive features between the sounds of the two languages. These differences can pose challenges for learners, particularly when it comes to accurately perceiving and producing sounds that do not exist or are used differently in their native language.

Moreover, this phenomenon extends to certain Arabic dialects; for example, in Egypt, individuals encounter difficulty accurately articulating /θ/ and /ð/. They inadvertently substitute /θ/ with /s/ and /ð/ with /z/, thereby conflating contrastive dental and interdental sounds.

Within this context, the present study assumes critical relevance and necessity. There is a pressing

demand to tackle the pronunciation challenges encountered by non-native speakers, given that the accurate enunciation of Arabic phonemes forms the fundamental basis for proficient language utilization. Multiple investigations in the field of Arabic language instruction for non-native learners underscore the paramount importance of precise Arabic sound pronunciation as a central skill in effective language pedagogy [10].

The current research adopts AI-enhanced narratives, an innovative technique designed to address these challenges. This approach, capitalizing on the harmonious integration of AI-enhanced media and narratives, represents a promising avenue for honing the pronunciation skills of non-native learners. Through purposeful inclusion of narratives spotlighting Arabic interdental consonants, we set forth on a mission to develop the competency of non-native individuals in pronouncing Arabic sounds.

## II. Related Literature:

To accomplish the study's objectives, it will be essential to conduct a thorough review of the existing literature on L2 Arabic pronunciation, with a specific focus on unfamiliar Arabic contrastive sounds and AI-enhanced narratives in language instruction.

### A. L2 Arabic Pronunciation Challenges:

Within the context of teaching Arabic as a foreign language, numerous studies have shed light on the challenges associated with pronouncing Arabic consonants. Many of these consonants, including dental, guttural, and emphatic sounds, have no direct counterparts in many languages worldwide [2], [5], [6].

Pronunciation challenges have piqued the interest of linguists for years. The significance of these sounds in Arabic lies in their role in conveying meaning within words and sentences, and any confusion between them and similar consonants can lead to miscommunication [10], [2], [11], [5], [6].

Understanding the challenges learners face when attempting to articulate Arabic sounds is crucial in establishing the context for this study and emphasizing the need for effective pedagogical approaches. A study conducted by Masiri and Al-Amin [12] on Malaysian Arabic language learners revealed that 90% of respondents encountered difficulties in pronouncing guttural sounds (e.g., 'ayn and ha), while 80% struggled with laryngeal sounds (including ha'a and hamza). This research highlights the fact that Arabic language instructors often regard challenging sounds as ordinary, potentially leading to pronunciation errors, which can negatively impact listening and speaking competence [10], [2].

Moreover, these challenges can result in communication problems and hinder learners' overall language acquisition progress [13], [11], [14].

Aldamen examined the effectiveness of a training program aimed at improving the perception and production of Arabic emphatic consonants in American-English speakers. The study involved 20 participants with no prior Arabic knowledge, split into a trained group and a control group. The results showed significant improvement in the trained group, highlighting the effectiveness of targeted instruction for non-native speakers in learning Arabic [15].

In 2023, Haj Ahmed and al-Baghdadi [16] analyzed phonetic errors among non-Arabic speakers at the Institute of Arabic Linguistics, King Saud University. The study employed a descriptive approach, focusing on audio recordings of second- and third-level students, with an emphasis on oral language aspects. The researchers identified common errors, such as pronouncing "Ain" as "Hamzah," "Dhaad" as "Daal," "Thaal" as "Zha'a," and omitting long vowels. Drawing on linguistic theories by Ibn Khaldoun and Ibn Jinni, the study also explored the factors contributing to these errors and proposed strategies to address them.

#### B. *Unfamiliar Arabic contrastive sounds:*

While dental sounds are commonplace across various languages, including English, Arabic introduces a distinctive array of dental and interdental consonants. Unlike English, which encompasses only /ð/ and /θ/, Arabic boasts a broader spectrum of such sounds. In Arabic, dental sounds are produced with the tongue making contact with either the upper front teeth or the alveolar ridge (the bony ridge situated just behind the upper front teeth) [17].

For non-native speakers, Arabic dental consonants present a unique phonetic hurdle. This category encompasses consonants such as /t/, /t/, /d/, /d/, /z/, /n/, /l/, /s/, as well as interdental consonants like /θ/ and /ð/ [18].

Researchers underscore the existence of unfamiliar Arabic contrastive dental and interdental sounds, distinct from those prevalent in the native languages of Malaysians and Kurds. These sounds form contrasting pairs within the Arabic language, serving to impart nuanced distinctions between words. Such sounds remain alien and absent from the linguistic repertoire of native speakers.

Prior research has explored the specific articulatory challenges learners face when attempting to produce these dental consonants,

which are a fundamental feature of Arabic pronunciation.

In recent years, the integration of technology into language learning has transformed traditional instructional approaches. AI-enhanced narratives, which combine storytelling with AI tools, offer immersive and interactive experiences for language learners. Abdellaoui [19] highlighted the effectiveness of AI in teaching Arabic to non-native speakers, demonstrating how AI-based methods can enhance language learning outcomes, particularly in remote education.

Previous research has demonstrated the effectiveness of narratives in various aspects of language learning, including reading comprehension and oral proficiency. For example, Al-Fawzan [20] employed the digital storytelling strategy (DSS) to teach reading comprehension to non-native Arabic learners and found it to be highly effective in improving their comprehension skills. Similarly, Al-Ali [21] investigated the use of the story map strategy, which involves creating visual representations, such as diagrams and images, to illustrate different elements and components of a story. This strategy aims to provide learners with a comprehensive understanding of the narrative and significantly improved students' reading comprehension skills. In another study, Allan [22] explored the use of digital narratives to enhance reading aloud skills among second-grade Arabic language students and assessed their motivation toward using this method. The research demonstrated that the use of digital stories effectively improves students' reading aloud skills and boosted their motivation to engage with this approach. These findings collectively suggest that integrating story-based strategies into Arabic language instruction can serve as a valuable tool for enhancing language learning outcomes among non-native Arabic speakers.

Previous investigations, exemplified by Abdelsalam [23] in 2020 and Abu El Enein [24] in 2019, have affirmed the efficacy of digital storytelling in enhancing language skills, notably in the context of English as a Foreign Language (EFL) speaking proficiency. The process of digital storytelling encompasses the creation of digital narratives utilizing tools like MS Photo Story, and it encompasses areas such as vocabulary development, enhancement of attention and listening capabilities, and the construction of coherent sentences, as emphasized by Lee [25].

However, while previous research has explored AI-enhanced narratives in language education, their

specific impact on pronunciation, especially in Arabic as a second language, remains underexplored. This study addresses this gap by investigating the effectiveness of AI-enhanced narratives in improving the pronunciation of dental consonants among non-native Arabic speakers, aiming to enhance our understanding of technology's role in language learning.

#### C. *Purpose of the study:*

This research is dedicated to enhancing L2 Arabic pronunciation, with a specific emphasis on unfamiliar Arabic contrastive consonant sounds, through the innovative use of AI-enhanced narratives. The integration of AI-enhanced narratives as a pedagogical tool in L2 acquisition is a relatively recent development, yet it holds substantial promise.

AI-enhanced narratives use multimedia resources like audio, video, and interactive platforms to create engaging, context-rich language learning experiences. Integrating these digital narratives into Arabic L2 instruction helps improve learners' pronunciation, especially in dental consonants.

#### D. *The Significance of the Study:*

- Enhancing the overall language learning experience for Arabic learners, particularly their pronunciation competence.
- Addressing specific challenges related to unfamiliar Arabic contrastive consonant sounds, which are unique to Arabic language acquisition.
- Contributing to innovative language instruction methods by exploring AI-enhanced narratives as an effective teaching tool.
- Filling the gap in effective interventions for Arabic pronunciation challenges.
- Potentially benefiting Arabic educators by facilitating the integration of AI-enhanced narratives into Arabic language programs.
- Improving Arabic language competence to promote cross-cultural understanding, create economic opportunities, and facilitate academic pursuits in Arabic-speaking regions.

#### E. *Limits of the Study:*

The study's limitations are outlined as follows:

##### Pronunciation Focus:

- **Pronunciation Focus:** This research centers on pronunciation challenges, particularly unfamiliar Arabic contrastive sounds, which are significant in Arabic language learning and affect clarity of meaning.

- **Kurdish and Malaysian Learner Sample:** The study focuses specifically on Kurdish (L1) and Malaysian (L1) Arabic learners, providing an in-depth exploration of their challenges with unfamiliar Arabic contrastive sounds.
- **Intermediate B2 Level:** The research targets learners at the intermediate B2 level, a pivotal stage in language acquisition. At this level, learners possess foundational Arabic phonetic skills but encounter specific pronunciation obstacles on their journey to fluency.

#### F. *Procedural Definitions:*

**Unfamiliar Arabic Contrastive Sounds:** These are Arabic consonants, specifically /θ/ and /ð/, which pose challenges for learners from various linguistic backgrounds. These sounds are often mistaken for /s/ and /z/ respectively, as they are absent in the native languages of the participants.

**AI-enhanced narratives:** This approach integrates language learning with storytelling, utilizing AI tools to enrich the process. It involves several steps: initiating an engaging narrative, focusing on pronunciation, acquiring relevant vocabulary, incorporating these words into the story, promoting collaborative story creation, refining the narrative with AI assistance, and concluding with sharing. The primary goals of this strategy are to improve pronunciation skills, broaden vocabulary, and foster shared experiences among students.

**Pronunciation:** The precise articulation and production of speech sounds in the Arabic language, essential for effective communication and language proficiency.

#### G. *Statement of the Problem*

Arabic learners, as noted in previous studies [26, 27, 28], frequently encounter challenges in accurately pronouncing unfamiliar Arabic contrastive consonants. These challenges can be attributed to the absence of such phonemes in their native languages or the resemblance in place of articulation and/or manner of articulation.

Furthermore, within the intermediate level (B1) of Arabic language learning, second language (L2) learners encounter significant challenges in both pronouncing unfamiliar Arabic consonants and distinguishing between them. These challenges extend beyond pronunciation and affect spelling when these consonants are used in words. It is noteworthy that effective interventions to address these obstacles are conspicuously lacking.

This study aims to confront these issues related to pronunciation and spelling by exploring the potential of AI-enhanced narratives as a tool to improve the mastery of Arabic interdental consonants among L2 learners.

#### H. *Questions of the study.*

The study poses the following questions:

1. Is there a statistically significant difference in scores related to the perception of unfamiliar Arabic contrastive sounds between the experimental group taught using AI-enhanced narratives and the control group taught using the traditional method?
2. Is there a statistically significant difference in scores associated with the production of unfamiliar Arabic contrastive sounds between the experimental group taught using AI-enhanced narratives and the control group taught using the traditional method?

### III. *Research Methodology*

This study investigates the effectiveness of AI-enhanced narratives in improving L2 Arabic learners' pronunciation of unfamiliar contrastive sounds, particularly focusing on differentiating between interdental and dental consonants. AI-enhanced narratives provide contextualized exposure, aiding in the acquisition of accurate pronunciation.

#### A. *Study Design:*

This study employed a quasi-experimental design with a control group consisting of 21 learners and an experimental group composed of 23 learners during the first setion of 2023-2024. This grouping was a crucial step to ensure that any observed effects could be attributed to the intervention rather than pre-existing differences among participants. Each participant was tested before and after treatment. The treatment group received instruction using AI-enhanced narratives, while the control group received the same content using traditional teaching methods.

#### B. *Subjects of the Study:*

The study selected 44 participants from groups of Kurdish L1 and Malaysian L1 learners who were at the B2 level in the process of learning Arabic as their second language. These participants were drawn from language classes at Mansoura University, Egypt. To ensure fair and unbiased allocation, participants were randomly assigned to either a control or experimental group.

#### C. *Study Instrument:*

The following tools were employed by the researchers to assess the impact of the intervention,

1. Pre- and Post-Pronunciation Skills Test: Pre- and post-test was administered to assess participants' ability in distinguishing and pronouncing unfamiliar Arabic contrastive sounds before and after the intervention. The assessment encompassed two sections:

a. Perception Tasks: Participants engaged in perception tasks, aimed at identify and discriminate unfamiliar Arabic contrastive sounds. This component focused particularly on their capacity to distinguish between dental and interdental consonants.

b. Production Tasks: Production tasks required participants to accurately articulate Arabic sounds. The emphasis was on correct pronunciation of unfamiliar Arabic contrastive sounds.

2. Audio Recordings: Audio recordings were used to capture participants' oral renditions of unfamiliar Arabic contrastive sounds. These recordings were subsequently analyzed to evaluate the accuracy of their articulation and measure their improvement throughout the intervention period.

3. The AI-enhanced narratives project utilized various tools to improve pronunciation of unfamiliar Arabic contrastive sounds. The project integrated text-to-speech (elevenlabs.io), visual content (PNGtree, Microsoft's Designer), image animation (leiapix), and sound effects (Canva) to create an engaging learning platform. This approach was particularly beneficial for Malaysian and Kurdish learners facing challenges with Arabic pronunciation.

These tools collectively facilitated the measurement of participants' improvement in effectively addressing their pronunciation challenges concerning unfamiliar Arabic ontrastive sounds through the AI-enhanced narratives.

#### *Validity of the Test:*

To establish the validity of the pronunciation test, the researchers presented its initial form to a panel of 10 experts who served as arbitrators. These arbitrators were tasked with providing their insights and observations concerning the test. They were asked to assess the relevance of the test questions to the study's objectives, evaluate the extent to which the specific questions accurately represented the behavioral indicators being measured, and assess the overall structural and linguistic integrity of the test. Furthermore, the arbitrators were encouraged to recommend any

necessary deletions, additions, or modifications to enhance the test's appropriateness.

#### *Reliability of the Test:*

To ensure the reliability and consistency of the pronunciation test, it was administered to a pilot sample of 10 Kurdish and Malaysian learners, randomly selected from Mansoura University in Egypt. This pilot test was conducted on November 15, 2023. To assess the test's internal consistency, Cronbach's alpha was calculated, and the results are presented in Table No. 1. This analysis helps gauge the reliability of the test and the consistency of participant responses, which is essential for ensuring the robustness of the test as a research instrument.

*Table 1: Reliability Coefficients for Pronunciation Test Questions*

Pronunciation Skills	Question	Consistency Value
1. Identification	1	0.73
	2	0.84
	3	0.76
2. Production	4	0.78
	5	0.82
	6	0.68
Total	6	0.77

The results presented in Table 1 demonstrate a consistency coefficient of (0.77) between the two documents. Regarding the test questions, their consistency ranges from a maximum of (0.84) to a minimum of (0.68), indicating an acceptable and good level of consistency overall. Cronbach's alpha consistency coefficient ranges from (0-1), where values closer to (1) indicate higher consistency and values closer to (0) indicate lower consistency. For research purposes, a Cronbach's alpha value of (0.6) is considered acceptable, according to Deliu's (2014) scale. Therefore, the application of the test in this study is deemed appropriate.

#### *D. Equivalence of the Two Study Groups:*

To ensure that the experimental and control groups exhibited similar pronunciation ability before the study commenced, both groups underwent the pronunciation test. Subsequently, the researchers calculated the means and standard deviations for both groups. A t-test was then conducted to determine if there were significant differences between the groups. This t-test was utilized in the pre-test phase to assess the variance in combined pronunciation skills between the two study groups. The results of this analysis are summarized in Table No. 2.

*Table 2: Mean Scores, Standard Deviations, t-Values, and Significance Levels for the Experimental and Control Groups in the Pre-Test of Pronunciation Abilities*

Group	N	Mean	Standard Deviation	t	Significance
Experimental	21	9.8	0.54	0.59	Insignificant
Control	23	10.2			

#### *E. Intervention Phase:*

The intervention phase spanned four weeks. During this period, the experimental group received AI-enhanced narratives, while both the control and experimental groups continued to receive traditional language instruction. This intervention aimed to address the research question.

#### *F. Data Collection:*

Data collection occurred at two distinct time points: before the introduction of the intervention and after its implementation. This data was collected through the pronunciation test of unfamiliar Arabic contrastive sounds. The purpose was to assess the impact of the intervention on the dependent variable(s) of interest.

#### *G. Data Analysis:*

The collected data underwent rigorous statistical analysis. The objective was to assess whether a statistically significant difference existed between the control and experimental groups before and after the intervention. This analysis helped determine the effectiveness of the intervention in addressing the research question.

## **IV. Study Results and Discussion**

The research employed a pre-test/post-test experimental design. Participants, who were Kurdish (L1) and Malaysian (L1) learners of L2 Arabic, underwent assessments to measure their ability to distinguish between unfamiliar Arabic contrastive sounds both before and after receiving instructional interventions. The experimental group was exposed to an AI-enhanced narrative approach along with feedback.

The findings from the study indicated a noteworthy improvement in the post-test performance of the experimental group compared to the control group. This suggests that the integration of the AI-enhanced narrative approach effectively improves the ability of Kurdish (L1) and Malaysian (L1) learners to discriminate between unfamiliar Arabic contrastive sounds in their pronunciation of L2 Arabic.

The research also provided detailed insights into the specific aspects of the intervention's effectiveness. For instance, it examined the impact of the particular narratives utilized in the

instructional content and focused on specific frequency analyses.

In summary, the study's results lend support to the idea that AI-enhanced narratives are a valuable approach for teaching Arabic pronunciation. The recommendations derived from these findings have practical implications for the incorporation of such instructional methods in language learning contexts.

Research Questions:

1. Is there a statistically significant difference in scores related to the perception of unfamiliar Arabic contrastive sounds between the experimental group taught using AI-enhanced narratives and the control group taught using the traditional method?
2. Is there a statistically significant difference in scores associated with the production of unfamiliar Arabic contrastive sounds between the experimental group taught using digital narratives and the control group taught using the traditional method?

To answer the research questions, mean and standard deviation values were calculated for both groups, and an independent sample t-test was conducted to compare the average scores between the two groups in the post-test for pronunciation skills across the three components and overall. Table 3 provides a visual representation of these results.

Table 3: Mean Scores, Standard Deviations, T-Values, and Significance Levels for the Experimental and Control Groups in the Post-Test of the Pronunciation Test

Variable	Group	N	Mean	Std. Deviation	t	Sig. (2-tailed)
Identification	Exp.	21	13.24	1.58	13.42	0.00
	Cont.	23	6.65	1.67		
Production	Exp.	21	12.86	1.82	14.52	0.00
	Cont.	23	6.04	1.26		
Pronunciation	Exp.	21	26.10	6.44	10.44	0.00
	Cont.	23	12.70	2.05		

Table 4 summarizes the pre- and post-test mean scores, standard deviations, mean changes, t-values, and significance levels for both the experimental and control groups across all variables.

Table 4: Pre- and Post-test Comparison for Experimental and Control groups

Variable	G	N	Pre-Test Mean	Pre-Test Std. D.	Post-Test Mean	Post-Test Std. D.	Mean Change	t-Value	Sig. (2-tailed)
Identification	Exp.	21	7.00	1.50	13.24	1.58	6.24	13.42	0.00
	Cont.	23	6.50	1.60	6.65	1.67	0.15		
Production	Exp.	21	6.50	1.70	12.86	1.82	6.36	14.52	0.00
	Cont.	23	6.00	1.40	6.04	1.26	0.04		
Pronunciation	Exp.	21	13.50	4.00	26.10	6.44	12.60	10.44	0.00
	Cont.	23	12.00	3.00	12.70	2.05	0.70		

The discussion of the results, as presented, analyzes the findings from the study's pronunciation

competence post-test, comparing the performance of the experimental group (AI-enhanced narratives) and the control group (traditional instruction). Here's a breakdown of the discussion:

1. Comparison of Mean Scores: Table 3 provides a comparison of mean scores between the experimental and control groups for both individual components and the overall pronunciation test score. Notably, it is observed that the mean scores for the experimental group outperform those of the control group in all aspects of the test.
2. Statistical Significance: The calculated "t" value is noted to be statistically significant at a confidence level of 0.05. This statistical significance indicates that the utilization of AI-enhanced narratives had a discernible and meaningful impact on the results.
3. Effectiveness of AI-enhanced narratives: The discussion then delves into the potential reasons for the superior performance of the experimental group.

### V. Discussion

The findings of this study are consistent with previous research [12], which has consistently shown that non-native learners of Arabic often encounter challenges when attempting to pronounce unfamiliar Arabic contrastive sounds. These challenges can potentially result in pronunciation errors, subsequently impacting their listening and speaking abilities [10, 2].

The results of the current study indicate that AI-enhanced narratives represent an effective approach for enhancing the pronunciation competence of L2 non-native learners. The unique attributes of AI-enhanced narratives offer a more engaging and personalized learning experience, ultimately leading to improved learning outcomes. Additionally, the flexibility of accessing the narrative through various devices allows learners to learn at their preferred pace and convenience, which can bolster motivation and engagement.

These findings are consistent with previous research [20, 21] that has demonstrated the effectiveness of AI-enhanced narratives in improving various language skills. Furthermore, the utilization of AI-enhanced narratives has proven particularly advantageous for non-native learners, as it enables tailored and adaptable learning experiences that cater to diverse learning preferences and proficiency levels. Consequently, the integration of interactive smart textbooks into language education can significantly enhance language teaching and learning practices.

In summary, the discussion highlights the efficacy of AI-enhanced narratives in enhancing the

pronunciation competence of non-native Arabic speakers. It emphasizes that this approach not only leads to statistically significant improvements but also cultivates active engagement, meaningful interaction, motivation, challenge, and self-assurance among learners, all of which collectively contribute to their overall proficiency in mastering Arabic pronunciation.

### VI. Conclusion

In conclusion, the findings of this study underscore the efficacy of AI-enhanced narratives in fostering the development of pronunciation competence among non-native learners, particularly within the context of unfamiliar Arabic contrastive sounds. This research highlights the importance for educators to consider the integration of narrative-based elements into their teaching methodologies, recognizing their potential to significantly enhance the learning experiences of their students.

While this study primarily focuses on the realm of pronunciation competence, it is imperative to acknowledge the broader implications of narratives in language education. Further research endeavors should delve into exploring the applicability of narratives in other facets of language learning and delve deeper into identifying the specific attributes of narratives that contribute to superior learning outcomes. Such investigations will undoubtedly enrich our understanding of how narrative-based approaches can be harnessed more comprehensively within language education.

### Recommendations:

1. Arabic language instructors should integrate AI-enhanced narratives into their teaching to improve pronunciation.
2. Instructors should use technology, especially frequency analysis tools, to assess and enhance pronunciation accuracy.
3. Learners should practice pronunciation regularly and seek feedback to improve their language skills.
4. Future research should investigate AI-enhanced narratives for teaching other aspects of Arabic, like grammar and vocabulary.

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