

A STUDY OF PHONETIC TRANSCRIPTION DIFFERENCES IN U-DICTIONARY APPLICATION AND GOOGLE TRANSLATOR

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Abstract

This research aims to identify the differences in phonetic transcription between the U-Dictionary application and Google Translate, with a specific focus on diphthongs. A descriptive qualitative design was employed to analyze the data. Data were collected through documentation from both translation platforms and analyzed using the interactive model consisting of four stages: data collection, data reduction, data display, and conclusion drawing/verification. The findings reveal significant discrepancies in the phonetic notation systems used by the two applications. U-Dictionary consistently adopts the International Phonetic Alphabet (IPA) standards for all diphthong entries. In contrast, Google Translate utilizes a simplified phonetic respelling system, specifically the American Heritage Dictionary (AHD) standard. These results suggest that while U-Dictionary maintains academic precision, Google Translate prioritizes intuitive pronunciation for general users.

Keywords: Phonetic transcription, Diphthongs, U-Dictionary, Google Translate, IPA, AHD.

BACKGROUND

Linguistics has various sub-disciplines, and two of the disciplines are phonetics and phonology. Phonetics provides an objective way for people to describe and analyze the variety of sounds they use in their language. More precisely, articulatory phonetics accurately defines the speech organs and muscles involved in the production of diverse sounds in the world's languages. These sounds are subsequently conveyed from the speaker to the listener, and acoustic and auditory phonetics are the mechanics of the sound as it travels through the air in the form of sound waves, and these waves focus on the impact. Therefore, phonetics is strongly associated with anatomy, physiology, physics, and neurology. There are several reasons for the importance of phonetic transcription in learning English (foreign language), including; Facilitate the correct pronunciation of words and help us

learn English, especially in speaking and listening. Phonetic transcription, or grapheme-to-phoneme conversion, is the process of representing the written form of a word into an acoustically derived form that is suitable for the correct reading or pronunciation of the respective word. According to Ladefoged & Johnson (2010), phonetic transcription as a method of recording and representing language sounds with specific phonetic symbols. They explain that phonetic transcription aims to capture every detail of a spoken sound, including variations that may not be apparent in a standard orthographic transcription. Phonetics is the study of sounds spoken by a human. Phonetic transcription is the use of phonetic symbols to represent speech sounds. Ideally, each sound in a spoken utterance is represented by a written phonetic symbol, so as to furnish a

record sufficient to render possible the accurate reconstruction of the utterance. According to Heselwood (2013), phonetic transcription is concerned with how the sounds used in spoken language are represented in written form. phonetic transcription uses notation to write an analysis of pronunciation forms using language-independent symbols. When we learn phonetics, we automatically learn about diphthongs. Diphthongs are called phonetics because they are a combination of two vowels pronounced consecutively in one breath. Diphthongs are an important part of phonetics in understanding the pronunciation of a language. Diphthong is a combination of two vowel sounds. Diphthong is derived from the term Yunani, diphthong is derived from two words: *di* and *phthong*. *Di* means "do it twice," while *phthong* means "sound." Diphthong is a vocal sound with unique characteristics. According to Hudson (2012) Diphthongs are two different vowels that are pronounced sequentially in one utterance. According to Mustikareni (2013), there are distinction between the closing and centering diphthongs. In closing diphthong, the second vowel is closer than the first vowel because the tongue moves from the open position to the closer vowel, whereas in a centering diphthong, the second vowel is more central than the first vowel. After all, the tongue moves in the direction of the central vowel. English closing diphthongs consist of / eɪ /, / oʊ /, / aɪ /, / aʊ /, and / ɔɪ /. The second vowel in an English centering diphthong is more central than the first. English centralized diphthongs consist of / ɪə /, / eə /, and / ʊə /.

Now is the era of globalization, where doing all the work is easy, we only need to hold our mobile phones to solve the problem. For example, to Translator a word or sentence, we do not need to open a thick dictionary. Just by opening Google on a cell phone, we can find out the meaning and pronunciation of foreign languages easily.

There are several sources that we often use to Translator foreign languages, such as, google Translator and U-Dictionary applications. Google Translator is a translation service developed by Google. According to Dahmash (2020), the Google Translator website was launched as a language-to-language translation service and allowing users to Translator source text at the level of words, phrases, sentences, and essays. This medium is used to improve the vocabulary acquisition of students. Classified as a language subskill. Student acquisition Sub-skills such as vocabulary support the acquisition of other language skills (speaking, writing, reading, listening). Google Translator's features relate to three skills other than writing: listening, speaking, and reading.

Meanwhile, U-Dictionary application is a Translator application based on Android and iOS that can be installed on smartphones. Zheng (2015) found that the U-dictionary application has a particularly useful feature that helps students Translator words and phrases as they type, taking pictures and uploading them so that the system can scan the text and Translator it directly. It states that it is prepared. The camera feature allows the user to scan the source language without typing and immediately see the meaning of the target.

These two applications are not only capable of translating a text or pronunciation, but are also capable of translating text in images. In addition, the U-Dictionary application also has a grammar check feature that checks sentence structure. Both applications have some differences, one of them is the differences in phonetic transcription that people rarely know about.

LITERATURE REVIEW

The Role of Phonetic Transcription in Language Learning

Phonetic transcription provides a precise visual representation of speech sounds, effectively bridging the persistent gap

between irregular orthography and authentic pronunciation (Ghorbani, 2019). As Roach (2009) emphasizes, the International Phonetic Alphabet is indispensable for second-language learners, enabling them to circumvent ambiguities inherent in English spelling irregularities, which can otherwise lead to entrenched mispronunciations. Substantial empirical evidence confirms that the accuracy of phonetic symbols in dictionaries and translation tools is crucial for learners' capacity to achieve native-like pronunciation aligned with established standards (Bryła-Cruz, 2022), such as Received Pronunciation or General American; inaccuracies here not only compromise articulation but also undermine broader phonological competence and listening comprehension skills (Bajorek, 2017). Nevertheless, numerous beginner language learners struggle to interpret phonetic transcriptions in both online and offline dictionaries. This discrepancy underscores the need for a clear explanation. A systematic comparison can effectively illuminate these differences and guide learners toward reliable resources.

Machine Translation Technology and Digital Dictionaries

Advances in information technology have shifted the use of printed dictionaries toward digital applications such as U-Dictionary and Google Translate. Google Translate uses a Neural Machine Translation (NMT) system that focuses on sentence context, but often includes automatic phonetic transcription as an additional feature (Aiken, 2019). On the other hand, U-Dictionary is specifically designed as a language learning tool that integrates dictionary entries from trusted sources such as Oxford. These differences in databases often lead to discrepancies in the presentation of phonetic symbols.

Accuracy and Variation of Phonetic Symbols on Digital Platforms

Previous research indicates that digital platforms, such as language learning apps and online dictionaries, are not always consistent in their use of IPA symbols, often prioritizing accessibility over precision (Bajorek, 2017; Bryła-Cruz, 2022). These differences may stem from simplifying symbols to accommodate non-specialist users or variations in the dialect standards referenced, as noted by Handayani (2017). Such practices become problematic when apps employ non-conventional symbols, which can confuse learners engaged in formal studies of phonetics and phonology, thereby compromising their articulation accuracy, phonological competence, and listening comprehension (Bajorek, 2017).

Comparative Analysis Across Applications

Comparative studies of language applications have predominantly focused on the quality of text translation, with specific analyses of phonetic transcription, a cornerstone of pronunciation accuracy and phonological competence (Bajorek, 2017; Bryła-Cruz, 2022; Ghorbani, 2019) remaining notably scarce. This oversight is especially critical for U-Dictionary and Google Translate, both commanding vast global user bases yet fulfilling divergent roles: the former as a comprehensive language learning tool integrating trusted sources like Oxford, and the latter as a swift Neural Machine Translation service prioritizing contextual fluency over phonetic precision. A rigorous phonetic comparison is therefore imperative to empower learners, mitigate mispronunciations from inconsistent symbols, and enhance overall listening comprehension and articulation skills.

METHOD OF THE RESEARCH

Research Design

This study employs a qualitative descriptive design. In line with the perspective of Miles et al. (2019), qualitative research is a research procedure that generates descriptive data in the form of written or spoken words from the observed subjects as well as observable behavior. In the context of this study, a descriptive approach was used to identify, describe, and compare in depth the differences in phonetic transcription, specifically in the spelling of diphthongs, between the U-Dictionary and Google Translate applications.

Instruments and Data Sources

The primary instrument in this study is the documentation method. The researcher used two digital translation tools as primary data sources: the U-Dictionary app and the Google Translate platform. The data collected consists of word entries containing diphthongs, for which screenshots were taken to ensure the authenticity of the phonetic symbols displayed on both platforms at the time of data collection.

Data Collection Procedure

Data was collected through the following steps:

1. Identifying a list of English words with diphthong sound variations (such as /eɪ/, /aɪ/, /ɔɪ/, /aʊ/, /əʊ/, /ɪə/, /eə/, and /ʊə/).
2. Entering these words one by one into Google Translate and U-Dictionary alternately.
3. Recording and documenting the phonetic transcriptions that appear on each application for comparison.

Data Analysis Techniques

Data was analyzed using the interactive model by Miles et al. (2014), which consists of four concurrent activity streams:

1. Data Collection: The researcher collected all phonetic transcriptions of the predetermined words through the

documentation process on both applications.

2. Data Reduction: The researcher selected, focused, and simplified the raw data. At this stage, the researcher only retained data showing significant differences in the notation of diphthongs and discarded irrelevant data.
3. Data Presentation (*Data Display*): The researcher presented the reduced data in the form of comparison tables or narrative descriptions to help readers identify the differences in phonetic transcription between Google Translate and U-Dictionary.
4. Conclusion Drawing and Verification (*Conclusion Drawing/Verification*): The researcher draws conclusions based on the patterns of differences found and conducts a re-verification to ensure that the findings are consistent with the phonological theory used.

FINDING AND DISCUSSION

Findings

The data collected in this research were gained from the documentation of words found in U-dictionary application and Google Translator. The words documented were nouns and adjectives that contained diphthongs. There are eight diphthongs that are listed, they are diphthongs / eɪ /, / aɪ /, / ɔɪ /, / aʊ /, / əʊ /, / ɪə /, / eə / and / ʊə /.

Diphthong /eɪ/

Diphthong /eɪ/ is written differently in both applications. Here is the list of representative words contained the diphthong:

Table 1. Diphthong eɪ/

Words	Phonetic Transcription		Category
	U-dictionary	Google Translator	
Rain	/ɾaɪ/	/rān/	Noun
Face	/fæɪ/	/fās/	Noun
Crazy	/kɾeɪzɪ/	/krāzē/	Adjective
Great	/græɪ/	/grāt/	Adjective

The differences in the spelling of the diphthong /eɪ/ are illustrated in Table 1 using four example words. The comparison shows that U-Dictionary continues to follow the IPA standard by using the symbol /eɪ/, while Google Translate uses a different transcription system, displaying the symbol /ē/ for the same sound.

Diphthong /aɪ/

Diphthong /aɪ/ is written differently in both applications. Here is the list of representative words contained in the diphthong:

Table 2. Diphthong /aɪ/

Words	Phonetic Transcription		Category
	U-dictionary	Google Translator	
Price	/praɪs/	/prīs/	Noun
crocodile	/ˈkrɒkədɪl/	/ˈkrāka.dīl/	Noun
Wide	/waɪd/	/wīd/	Adjective
Nice	/naɪs/	/nīs/	Adjective

Based on the data in Table 2, there is a discrepancy in the spelling of the diphthong /aɪ/ between the two applications. All data in U-Dictionary uses the notation /aɪ/, which conforms to phonetic rules, while Google Translate uses a different transcription system, displaying the symbol /ī/ for the same word category.

Diphthong /ɔɪ/

Diphthong /ɔɪ/ is written differently in both applications. Here is the list of representative words contained in the diphthong:

Table 3. Diphthong /ɔɪ/

Words	Phonetic Transcriptions		Category
	U-dictionary	Google Translator	
Toy	/tɔɪ/	/tōɪ/	Noun
Boy	/bɔɪ/	/bōɪ/	Noun
Noisy	/ˈnɔɪzi/	/ˈnōɪzē/	Adjective
Moist	/mɔɪst/	/mōɪst/	Adjective

Table 3 presents four words containing the diphthong /ɔɪ/ and highlights a discrepancy in transcription between the two digital dictionaries. The findings confirm that U-Dictionary consistently uses the symbol /ɔɪ/,

whereas Google Translate represents it using the symbol /oi/.

Diphthong /aʊ/

Diphthong /aʊ/ is written differently in both applications. The following table is showing the list of representative words contained in the diphthong /aʊ/:

Table 4. Diphthong /aʊ/

Words	Phonetic Transcriptions		Category
	U-dictionary	Google Translator	
Bound	/baʊnd/	/bound/	Noun
Mountain	/ˈmaʊntən/	/ˈmoun(ə)n/	Noun
Brown	/braʊn/	/broun/	Adjective
Proud	/praʊd/	/proud/	Adjective

Table 4 shows a difference in symbolic representation between the two applications; U-Dictionary consistently uses the notation /aʊ/, while Google Translate transcribes it as /ou/.

Diphthong /əʊ/

Diphthong /əʊ/ is written differently in both applications. Here is the list of representative words contained in the diphthong:

Table 5. Diphthong /əʊ/

Words	Phonetic Transcriptions		Category
	U-dictionary	Google Translator	
Boat	/bəʊt/	/bōt/	Noun
Phone	/fəʊn/	/fōn/	Noun
Open	/ˈəʊpən/	/ˈōp(ə)n/	Adjective
Slow	/sləʊ/	/slō/	Adjective

Table 5 presents four sample words containing the diphthong /əʊ/. The data reveal a systematic difference in the graphic representation of this diphthong; U-Dictionary consistently uses the notation /əʊ/, while Google Translate uses the symbol /ō/ to represent the same sound.

Diphthong /ɪə/

Diphthong /ɪə/ is written differently in both applications. Here is the list of representative words contained in the diphthong:

Table 6. Diphthong /ɪə/

Words	Phonetic Transcription		Category
	U-dictionary	Google Translator	
Year	/jɪə(r)/	/jɪr/	Noun
Pier	/pjɪə(r)/	/pɪr/	Noun
Dear	/dɪə(r)/	/dɪr/	Adjective
Clear	/klɪə(r)/	/ˈkɪr/	Adjective

Table 6 presents four words containing the diphthong /ɪə/. The data reveals a difference in symbolic representation between the two platforms, with U-Dictionary consistently using the notation /ɪə/, while Google Translate represents it more simply with the symbol /i/.

Diphthong /eə/

Diphthong /eə/ is written differently in both applications. Here is the list of representative words contained the diphthong:

Table 7. Diphthong /eə/

Words	Phonetic Transcription		Category
	U-dictionary	Google Translator	
Chair	/tʃeə(r)/	/tʃeɪr/	Noun
Pair	/peə(r)/	/peɪr/	Noun
Fair	/feə(r)/	/feɪr/	Adjective
Rare	/reə(r)/	/reɪr/	Adjective

Table 7 details four sample words containing the diphthong /eə/. The data show a significant difference in transcription systems; U-Dictionary consistently uses the notation /eə/, while Google Translate represents it using the symbol /ē/.

Diphthong /ʊə/

Diphthong /ʊə/ is written differently in both applications. Here is the list of representative words contained the diphthong:

Table 8. Diphthong /ʊə/

Words	Phonetic Transcriptions		Category
	U-dictionary	Google Translator	
Tour	/tʊə(r)/	/tʊr/	Noun
Manure	/məˈnjuə(r)/	/məˈnɪ(y)ʊr/	Noun
Sure	/ʃʊə(r)/	/ʃHʊr/	Adjective
Pure	/pjʊə(r)/	/pɪʊr/	Adjective

Table 8 presents four-word samples containing the diphthong /ʊə/. The data reveal systematic differences in symbolic representation; U-Dictionary consistently uses the standard notation /ʊə/, whereas Google Translate represents it using the symbol /oo/.

As a summary of the analysis conducted on eight types of diphthongs, Table 9 below presents a comprehensive comparison of the differences in phonetic transcription between the IPA standard used by U-Dictionary and the notation system adopted by Google Translate.

Table 9. Differences of Diphthong transcriptions in Google Translator and U-Dictionary

Standard IPA Diphthong	U-Dictionary	Google Translate
/eɪ/	/eɪ/	/ā/
/aɪ/	/aɪ/	/ī/
/ɔɪ/	/ɔɪ/	/oi/
/aʊ/	/aʊ/	/ou/
/əʊ/	/əʊ/	/ō/
/ɪə/	/ɪə/	/i/
/eə/	/eə/	/ē/
/ʊə/	/ʊə/	/oo/

Based on Table 9, a consistent pattern emerges in which U-Dictionary fully adopts the International Phonetic Alphabet (IPA) standard for every diphthong category. Conversely, Google Translate uses a simplified notation system that combines diacritical marks (such as macrons) with standard vowel sequences.

This data confirms that there is a total discrepancy (100%) in the spelling of diphthong symbols between the two platforms. This difference indicates that Google Translate tends to simplify phonetics to make it easier for the general public, while U-Dictionary maintains linguistic precision in accordance with international academic standards.

Discussion

This study aims to identify differences in phonetic transcription between the U-Dictionary and Google Translate apps, with a specific focus on the parts of speech known as nouns and adjectives. The findings reveal a dichotomy in the transcription standards used by these two platforms, each of which has different implications for users in the context of language learning.

Based on the data obtained, U-Dictionary consistently applies the *International Phonetic Alphabet* (IPA) standard. In line with the view of Hanumanthappa et al. (2014), IPA is a standard notation system that uses Latin symbols to represent language sounds accurately and universally. The use of IPA in U-Dictionary benefits language learners because this system is a global standard also used in prestigious dictionaries such as the *Oxford Advanced Learner's Dictionary* and the *Cambridge Advanced Learner's Dictionary*. This finding reinforces U-Dictionary's role as an academic tool supporting the study of etymology and phonology, where each symbol holds precise and unambiguous phonetic value for both linguists and language teachers.

In contrast, Google Translate adopts the American version of the transcription system, better known as the standard of the *American Heritage Dictionary* (AHD). Unlike IPA, which tends to be technical, the AHD system, or phonetic respelling, is designed to be more intuitive for the general public. Landau (1994) states that this system focuses on the visual similarity between symbols and the sounds produced in everyday conversation, particularly in *American English* dialects. This finding indicates that Google Translate prioritizes practicality for general users over technical linguistic accuracy. The use of symbols such as /ɪ/ (in Google Translate) to replace /aɪ/ (in IPA) is an effort at simplification so that users can guess the pronunciation without needing to understand formal phonetic rules.

This difference confirms the existence of standard variations across digital platforms. When linked to Handayani's (2017) research, these differences in transcription systems are often driven by the application's target audience. U-Dictionary appears to target language learners who require in-depth material (pedagogical), while Google Translate functions more as a tool for quick communication (utilitarian). It is important for language learners to understand this discrepancy to avoid confusion when switching from one platform to another, especially in understanding diphthong sound transitions that require visual precision in symbol recognition.

CONCLUSION AND SUGGESTION

Conclusion

This study concludes that there is a fundamental difference in the phonetic transcription systems used by the U-Dictionary and Google Translate apps in representing English diphthong symbols. The findings show that U-Dictionary consistently adopts the *International Phonetic Alphabet* (IPA) standard. This is evident in the use of symbols such as /eɪ/, /aɪ/, and /əʊ/, which are standard representations in formal linguistic and phonetic studies. This consistency makes U-Dictionary a more reliable tool for English learners who require accuracy in accordance with international academic standards.

In contrast, Google Translate does not use IPA standards, but instead employs a simplified notation system resembling diacritics or *phonetic respelling* (such as using /ɪ/ for /aɪ/ and /ō/ for /əʊ/), a practice often seen in the *American Heritage Dictionary*. The system used by Google Translate appears to be designed to help general users estimate pronunciation without having to learn complex IPA symbols. However, for users with a deeper understanding of linguistics, this system can lead to ambiguity because it does not

distinguish the quality of vowel transitions with the same precision as IPA.

Overall, although both applications are very useful as translation tools, there are significant discrepancies in their presentation of phonetic data. Researchers suggest that language learners and teachers be more selective in choosing digital platforms; U-Dictionary is more recommended for precise phonetic study, while Google Translate is better suited for quick and general understanding of word meanings.

Suggestion

Based on the conclusions of this study, the researcher offers the following recommendations:

For English Learners: Students or language learners are advised to exercise critical awareness when using digital translation apps. Given the differences in standards between U-Dictionary (IPA) and Google Translate (AHD), learners should use U-Dictionary as their primary reference when studying standard phonetic pronunciation, particularly to understand the precise transitions of diphthong sounds. Additionally, learners are encouraged to enrich their language input through literature, songs, and films to verify the sounds they learn from these applications.

For Future Researchers: This study has limitations because data collection was conducted online (via Zoom and Google Forms) due to the COVID-19 pandemic. The researcher's experience revealed technical challenges and communication barriers that caused some respondents to struggle with understanding specific points in the questionnaire. Therefore, future researchers are advised to conduct data collection offline or in person to ensure the validity of respondents' answers and gain a deeper understanding of how students perceive these differences in phonetic symbols.

For English Language Instruction: The researchers hope that the results of this study

can contribute to English language learning strategies, particularly in the areas of phonetics and phonology. Teachers are advised to introduce the differences in phonetic transcription systems to students so that they do not become confused when encountering inconsistent symbols on various digital platforms.

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