

Digital Preference and Lexical Learning: Exploring University Students' Shift from Print to Online Dictionaries in Pakistan

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ABSTRACT: This paper will explore how online dictionaries have become very popular among Pakistani university students as compared to the use of print dictionaries and how this has affected vocabulary development. It explores the pattern of dictionary use among the students, why they use digital dictionaries, and implications pertaining to the pedagogy of English language learning. It was composed of a mixed-methods design and quantitative data was obtained through a structured questionnaire to BS English students in COMSATS University, Vehari Campus and qualitative data was obtained through semi-structured interviews. Findings have shown that most students find online dictionaries more convenient, faster, portable, and with multimedia aspects like audio pronunciation and sample sentences. Online dictionaries have been discovered to be helpful in improving reading fluency, pronunciation, motivation, and independent learning. The difficulties were excessive reliance on direct translations, superficial processing of vocabulary as well as technical difficulties. The results concur with the Technology Acceptance Model, Constructivist Learning Theory and Cognitive Theory of Multimedia Learning. The research concludes that online dictionaries are useful in the learning of vocabulary, but pedagogical support and training is required in an effort to achieve better lexical and contextual retention.

KEYWORDS: Online Dictionaries, Print Dictionaries, Lexical Learning, Vocabulary Acquisition, University Students, English as a Second Language (ESL)

Introduction

Vocabulary learning has been revolutionized by the digital technology, as more and more dictionaries are substituted with online dictionaries. In English as a Second Language, university students find the digital dictionaries as their fast source of information as they can get the meanings, pronunciation, examples, and translations easily. Generation Z learners in Pakistan have demonstrated a preference towards digital learning because it is fast and convenient. But this change brings some questions on its effect in vocabulary learning. Online dictionaries are effective and provide multimedia functionality at the cost of reducing the capacity to work with words and context compared with what is encouraged in print dictionaries. Thus, the question to be considered is whether this digital desire really improves vocabulary learning or it just alters the way students get it.

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Research Problem

Although dictionaries are widely used, there is little literature to study the transition of print to online dictionaries in Pakistani universities. It is not evident that this transition enhances vocabulary acquisition and retention. Though print dictionaries might encourage more profound usage, online dictionaries might encourage shallow usage, which is affected by access to the internet, training, and digital literacy. This paper will examine why this shift has occurred and how this affects the development of the English vocabulary of students.

Objectives

1. To examine the impact of online dictionaries usage on lexical learning and vocabulary acquisition by the university students.
2. To investigate the main reasons behind the use of online dictionaries by university students in Pakistan as opposed to print dictionaries.

Research Questions

The purpose of the study will be to explore dictionary preferences in university students and how these relate to the development of vocabulary. The research questions are the following:

Q1: What is the impact of using online dictionaries on the learners of lexical learning and vocabulary acquisition of university students?

Q2: Why will the use of online dictionaries instead of print dictionaries continue to increase among university students in Pakistan?

Significance of the Study

The research assists educators and learners to learn about the evolving usage of dictionaries in Pakistan and promotes successful incorporation of online technology in vocabulary acquisition. It also brings out the advantages and drawbacks of print and digital dictionaries to inform the preferences of effective teaching and curriculum construction and enhance a more moderate utilization of them both. It also promotes the acquisition of critical dictionary skills so as to acquire vocabulary effectively.

Limitations

This paper is restricted on Pakistani university students, and it can influence the external validity of the results. Digital literacy differences, access to technology and language proficiency may be factors that affect results. Information derived through self-reported questionnaires, as well as interviews, might not aptly represent reality. The research is also limited to the English learners and the study is also done within a short period thereby limiting the information on the retention of the vocabulary over a longer period.

Overview of Methodology

The proposed study is a mixed-methods one (surveys and semi-structured interviews). Surveys will yield information about the dictionary use, preferences, and frequency of use among students whereas interviews will give more information on the experiences and challenges faced by the students. Descriptive statistics and thematic analysis are used to analyze the data in order to determine the correlation between use of digital dictionary and vocabulary learning outcomes.

Theoretical Framework

The paper relies on the TAM and Constructivist Learning Theory, which points out that students refer to digital dictionaries in self-directed learning but acquiring meaningful vocabulary would be impossible without word searches. The Cognitive Theory of Multimedia Learning provided by Mayer (2005) further provides that audio and example sentences improve the learning but excessive use of quick online search may lead to superficial learning. Generally, the framework focuses on the balance between the digital convenience and the guided and reflective learning to achieve more profound lexical acquisition.

Literature Review

Introduction

Significance of Lexical Learning and Utilization of Digital Dictionary

In the English language teaching, lexical learning is critical because vocabulary knowledge influences reading, writing, and communicative abilities. The emergence of smartphones and the internet has rendered online and mobile dictionaries as essential as they are to the university students and altered the process of learning vocabulary, processing it, and storing it.

As Khan and Sibtain (2019) add, dictionaries have not lost their relevance to lexical competence, but many students are resorting to online versions to get easy answers in the form of meanings, pronunciation, and examples without necessarily processing them. According to Lew (2011) online dictionaries change the meaning of words as perceived by learners whereas Alharbi (2016) observes the electronic dictionaries to be faster but the print dictionaries to be more reflective.

Historical Background

History of Dictionary Usage in L2

Dictionaries have been playing a varying role in language learning. Historically, print dictionaries have been the key instructional resource that facilitated reference abilities and profound meaning investigation (Landau, 2001; Atkins & Rundell, 2008). Nevertheless, only compact entries, symbols, and cross-references were also problematic among the students (Béjoint, 2010). The development of the internet and mobile gadgets presented the online and electronic dictionaries that provided immediate searching, sounds of pronunciation, corpus-based examples, and multimedia aids in vocabulary learning (Lew, 2011; De Schryver, 2003). Nation (2001) observes that repeated and intensive exposure to words through print dictionaries facilitates the long-term memory whereas electronic look-ups are faster, but can promote superficial processing unless under instructions. Researchers note that contemporary dictionaries aid learning independence and fluency, but the exercises of searching should be scaffolded by the teachers to enhance lexical proficiency (Schmitt, 2000; Lew, 2011).

Knowledge of Digital Preference in the use of Dictionary

User behavior Changing the behavior of users in the digital age

According to the recent studies, convenience, accessibility, and knowledge of the technology have an impact on the use of digital dictionaries among students. Ayciçek and Gur (2024) found that the generation is more inclined to e-dictionaries and mobile applications with pronunciation, bilingual translation, and example sentences, with more focus on speed and multifunctionality instead of collocations or context use. Equally, Din (2019) discovered that Pakistani learners access mobile dictionaries during classroom activities as a way of clarifying an instant word, which can cause surface learning of vocabulary. Generally, digital tools can increase efficiency and interaction and decrease the depth of lexicon without formal training on the strategy.

Theoretical Foundations

Theories of Learning Lexical in Digital situations

The vocabulary learning with the help of digital tools is explained by a number of theories. According to the Cognitive Theory of Multimedia Learning by Mayer (2005) verbal and visual input (meanings, pronunciation, examples) help to understand and remember in long-term memory. Constructivist Theory of Vygotsky (1978) focuses on self-directed learning and social interaction, which is provided by online dictionaries. The Technology Acceptance Model by Davis (1989) describes why they are adopted according to their usefulness and ease of use.

Effects of using Online Dictionary on Lexical learning

Vocabulary Memory and Cognition

Studies indicate that the effects of the types of dictionaries on lexical learning differ with online dictionaries being faster in search and immediate comprehension and the print dictionaries promoting processing and long term memory. Zorigt and Tumurbat (2022) concluded that e-dictionaries are more effective at improving short-term memory, and paper dictionaries are more effective at delayed retention because of increased cognitive load and incidental learning in the time-consuming manual search. In the same case, Bresó-Grancha, Jorques-Infante, and Moret-Tatay (2022) found that digital reading enables one to grasp simpler texts faster but tends to interact with them superficially, whereas print reading leads to more comprehensive interaction with vocabulary. According to Khan and Sibtain (2019), Pakistani university students tend to use online and mobile dictionaries because they are fast and offer bilingual support, although most of them do not have reference skills and do not scan collocations or examples. On the whole, these studies show that successful lexical acquisition is not determined by the medium itself but guided and reflective application and instruction based on strategy.

Perspectives and Pedagogical Implications of Teachers

Integration in the Classroom and Student Control

The attitudes of teachers have a great impact on the use of dictionaries in higher education. Pakistani educators who studied dictionaries on mobiles considered them simple and encouraging and encouraged independence (Din, 2019). but students tend to use direct translation rather than collocations, examples, and grammar. Likewise, Alamri and Hakami (2022) have observed that e-dictionaries increase literacy and motivation but should be guided by the teacher to adequately retain vocabulary and use it in context. Guided strategies and vocabulary logs are facilitated by reflective follow-ups, which encourage long-term lexical learning and online accessibility.

World-Being Cognitive and Behavioral Differences between Print and Digital Use

Depth and Attention Span of Learning

Zorigt and Tumurbat (2022) discovered that e-dictionaries are faster but less associative with less reflection than print dictionaries. Multimodal traits can increase motivation and comprehension, and Bresó-Grancha et al. (2023) have found that digitally literate students are able to process words at a higher rate with similar or superior understanding. The medium as a whole impacts attention and lexical learning and thus pedagogical assistance is necessary to lead to meaningful results.

Previous Research and Empirical Studies

Worldwide and Pakistani Results

An increasing amount of research analyzes the use of online dictionaries in the process of acquiring a second language. The learning of languages is going digital through dictionaries. According to Lew (2011) online dictionaries enhance access and readability, but might undermine semantic connections and cross-references, which points to a greater

epistemological change. This is a clear indication that concern should be addressed on the quality of lexical acquisition and not just convenience.

Alharbi (2016) conducted a study of the effects of monolingual, bilingual and electronic dictionaries on the EFL reading comprehension and vocabulary acquisition and found out that traditional dictionaries are more conducive towards conscious more deliberate learning, whereas electronic dictionaries enable quicker access to meanings especially when it comes to extensive reading. Based on this, Din (2019) found that mobile dictionaries in Pakistani universities brought about more participation and less classroom hesitation but promoted distractions and literal translation, which indicated the necessity of explicit dictionary training in order to develop the use of digital tools to a critical level.

The studies of Arab and Asian settings reveal this pedagogical effect of digital dictionaries. El-Sawy (2019) discovered that mini-dictionaries with audio and usage examples were better at teaching pronunciation, memory, and active vocabulary use than those without them and demonstrated that digital tools are more effective in learning when they are part of productive activities. Khan and Sibtain (2019) noticed that Pakistani law students tended to use online dictionaries due to their speed, the ability to use both languages, and portability, but they tended to focus on direct translations without referring to examples or collocations. These results show that digital preference is not a sufficient condition of lexical competence, and the gap in pedagogy is even more widespread.

Alamri and Hakami (2022) discovered that the use of e-dictionaries by EFL university students improved their control, motivation, and immediate learning of vocabulary using bilingual and phonetic support. In line with this, Bresó-Grancha et al. (2022) demonstrated in the lexical decision and comprehension tests that students accustomed to online text process digital texts faster, particularly easier ones, with no significant difference in comprehension indicating that preference and habituation determine the cognitive impact of format. This points to the fact that through regular usage of online interfaces, vocabulary can be processed and recalled at a higher rate, which was the trade-off between efficiency and depth.

In a comparison study, Zorigt and Tumurbat (2022) compared paper- and e-dictionaries and concluded that e-dictionary users had superior immediate word recognition and recall, whereas paper dictionary users demonstrated a higher retention level as the cognitive load of the manuals and incidental exposure of the manual search contribute to the better performance. Equally, Le (2023) found that Vietnamese EFL students who were strategic in their use of e-dictionaries in communicative tasks that involved checking of collocations and writing down new words in vocabulary journals retained more and used new words better than their counterparts who used dictionaries to translate.

Zamkova et al. (2023) discovered that Ukrainian EFL learners liked e-dictionaries because of the convenience and motivation but tended to ignore the usage notes and examples, so the application of digital tools without being aware of strategies can cause shallow vocabulary learning. As demonstrated by Hamilton (2025) internet searches benefited short term comprehension but had a negative effect on in-depth processing as opposed to traditional dictionaries. All these studies point to the existence of cross-national trade-off between depth and speed in lexical learning and the necessity of localized pedagogical interventions.

The literature generally indicates a transition of print to digital dictionaries, which makes the interactions more rapid, but, in many cases, superficial. Alharbi (2016) and Lew (2011) as well as Alamri and Hakami (2022) and Hamilton (2025) show that e-dictionaries improve the independence and efficiency of learners, yet with the condition of the availability of explicit instructions on the strategy of lexical mastery. The digital dictionaries provide quicker vocabulary acquisition and better pronunciations to the Pakistani university students who are using mobile

and online tools more, but without the scaffolded assistance, they would jeopardize the long-term and context-sensitive learning and retention.

Global Empirical Evidence

The change of traditional paper dictionaries to electronic ones has been a subject of a large-scale visibility, which presents a trade-off of efficiency, as well as the depth of learning. According to Loucky (2005) the combination of CALL applications and the use of electronic dictionaries led to the increase in motivation and vocabulary learning due to the multimodal exposure. On the same note, Chen (2010) also found that with electronic dictionaries; it was possible to access the meaning of the words much faster as compared to paper dictionaries, which encouraged greater manipulation of collocations and semantic associations.

According to Levy and Steel (2015) learners appreciated immediacy, pronunciation, and translation accuracy in e-dictionaries but found little usefulness in other features such as corpus example or usage note and this indicated that the perceived and pedagogical usefulness do not coincide. According to Tavakoli and Akbari (2015) e-dictionaries were found to enhance the reading comprehension of Iranian students in the short term, specific to the task and load lightness. Grami and Hashemian (2017) also demonstrated that e-dictionaries resulted in increased speed and confidence whereas paper dictionaries resulted in increased retention and inferential understanding.

Mohamad et al. (2017) found that e-dictionaries are time-conserving, portable, and full of multimedia but may result into shallow learning and distract individuals of contextual interpretation. The recent studies are about mobile and applications based dictionaries as the means to digital-native learners. Paturusi (2019) established that vocabulary knowledge of definition increased when e-dictionaries were used in university classes because learners experienced multi-contextual exposure to definitions.

Halamish and Elias (2022) have found that when it comes to digital vocabulary, digital form of retention is most successful, paper-based learning is best at traditional tests, and cognitive processing and retrieval are dependent on a medium of habit. Sarmila et al. (2022) indicated that e-dictionaries can facilitate vocabulary development in the Indonesian high schools, but teacher intervention was needed to encourage strategy-oriented instead of translation-oriented learning. The findings can be applied to Pakistan, where the motivation and digital self-efficacy of learners should depend on their socio-economic status.

The research by Dan et al. (2024) revealed that mobile dictionary application enhanced more vocabulary in high-motivated students and not much productive learning in low-motivated learners. On the same note, Haque et al. (2024) stated that technology-enhanced teaching cannot guarantee the acquisition of lexical mastery in the long term without pedagogical support. Collectively, these researches point to the fact that digital tools need to be explicitly instructed, contemplated, and mentored to transform quick access to meaningful learning.

In general, empirical research carried out in Iran, Indonesia, and EFL setting indicates that digital dictionaries increase speed, independence, and motivation. Nevertheless, they allow superficial and not deep, contextual learning without the teaching and contemplation of strategy. This points to Pakistani higher education the necessity of the pedagogical frameworks in the support of the development of the analytical, strategic, and context-specific vocabulary and the utilization of digital tools.

Challenges and Limitations

Shallow Learning, Excessive Dependence and Availability

E-dictionaries are handy and may be a motivation to surface study. Khan and Sibtain (2019) discovered that Pakistani students make use of literal translations instead of collocations and grammar, whereas Din (2019) concluded that

mobile dictionaries may become an addiction and reduce in-depth learning. During the accessibility concerns and multitasking could also diminish the attention and long-term memory (Halamish and Elias, 2022; Sarmila et al., 2022). All in all, vocabulary learning needs pedagogic instructions, explicit dictionary training, and thoughtful application not only as a digital convenience.

Conclusion

Introduction and Overview of the Current Research

Literature demonstrates the replacement of the deep and textual use of the print dictionaries with what can be described as faster yet superficial use of the online dictionaries, thus signifying an efficiency depth trade-off (Khan & Sibtain, 2019; Din, 2019; Alamri & Hakami, 2022; Zorigt & Tumurbat, 2022; Bresó-Grancha et al., 2023). Although e-dictionaries lead to autonomy, motivation and rapid learning, long term, contextual learning demands training in strategies and reflection. This paper looks at the role of the online dictionaries in the lexical acquisition in Pakistani university students, and attempts to fill the divide between the technological convenience and meaningful vocabulary acquisition and the practical pedagogical consequences.

Methodology

Research Design

The research design of the study is mixed methods whereby the impact that online dictionaries have on lexical learning among university students is investigated. It involves using quantitative data to study the pattern of use and frequency along with the perceived effectiveness, and qualitative data to understand the experiences, preferences, and challenges of students. Such an integrated methodology offers statistical trends and detailed information towards a holistic comprehension of the usage of digital dictionaries and the acquisition of vocabulary.

Participants and Sampling

The sample of the current study includes 70 undergraduate students of the English program of COMSATS University, Vehari Campus. Purposive sampling was used to select these students because they are active learners of English language, and they have a tendency of using dictionaries either print or electronic as study materials. The sample will consist of gender, academic achievements, and previous usage of digital tools to ensure a wide representation of the dictionary usage habits sample. This was a sample size of 70 students thought to be large enough to undertake any meaningful statistical analysis besides giving an opportunity to explore the qualitative aspect in-depth through interviews.

Data Collection Method

The present study was a mixed study that incorporated semi-structured interviews and structured questionnaires. The survey collected the quantitative information on the preferences of the students to the use of dictionaries by evaluating the frequency of their use and the effects on learning vocabulary on a five-point Likert scale. Also, the participants (12-15) were interviewed based on five open-ended questions to discuss their perceptions of print and online dictionaries, the impact on their vocabulary, pronunciation, and motivation. Through this method, both quantitative and qualitative information was obtained that improved the validity of the results.

Research Instrument

A questionnaire (the main instrument) consisted of three parts: demographic information (age, gender, academic level, digital literacy); tendencies and the motivation to use dictionaries online; the impact of online dictionaries on

vocabulary acquisition, retention, pronunciation, contextual use, and engagement were the main parts. The items were based on Alhatmi (2019) Abbasi et al. (2019) Zorigt and Tumurbat (2022) and Márkus et al. (2023) and adjusted to the situation in the Pakistani university. Experts validated content validity and a pilot study helped to clarify unclear items. Alpha was used to measure internal consistency whereby Cronbachs Alpha was used to measure reliability. To investigate the preferences, challenges, and vocabulary-learning impacts, semi-structured interviews were conducted according to Creswell (2009) the analysis of the transcripts was based on the theme.

Data Analysis Technique

The questionnaire results on the quantitative data were analyzed using the descriptive statistics including mean, percentages and frequency distributions. Interpretation of qualitative information in the form of interviews was done using thematic analysis to determine the trends in the use of dictionaries, student preferences, and the effects of digital dictionaries on vocabulary acquisition and pronunciation. This mixed methodology allowed getting not only statistical findings but also gaining deeper understanding of experiences of students, their motivations and problems.

Ethical Considerations

The research was done under ethics strictly. The study informed all participants about the aims of the study and got informed consent beforehand. The participation was entirely voluntary and the students were allowed to withdraw at any time without any repercussions. All personal identifiers were removed to ensure the confidentiality of the dataset and the information received was not used in any other way than as part of the research. The information was properly kept to secure privacy and ethical standards.

Data Analysis

The following section displays the results of the quantitative data analysis of 70 BS English students of COMSATS University, Vehari Campus, in terms of their preferences to digital and print dictionaries and their views to vocabulary acquisition and lexical learning. Frequencies and percentages are descriptive statistics that were used to summarize responses on each questionnaire item.

Below, the results are discussed with interpretation and references to the relevant studies (e.g., Alhatmi, 2019; Zorigt & Tumurbat, 2022; Márkus et al., 2023; Lew, 2011).

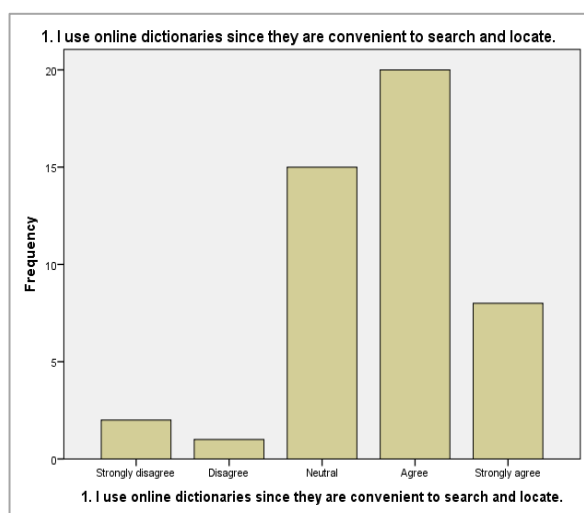
Frequency Tables & Bar Graphs

Tabel 1

I use Online Dictionaries Since they are Convenient to Search and Locate

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	2.7	4.3	4.3
	Disagree	1	1.4	2.2	6.5
	Neutral	15	20.3	32.6	39.1
	Agree	20	27.0	43.5	82.6
	Strongly agree	8	10.8	17.4	100.0
	Total	46	62.2	100.0	
Missing	System	28	37.8		
Total		74	100.0		

Figure 1



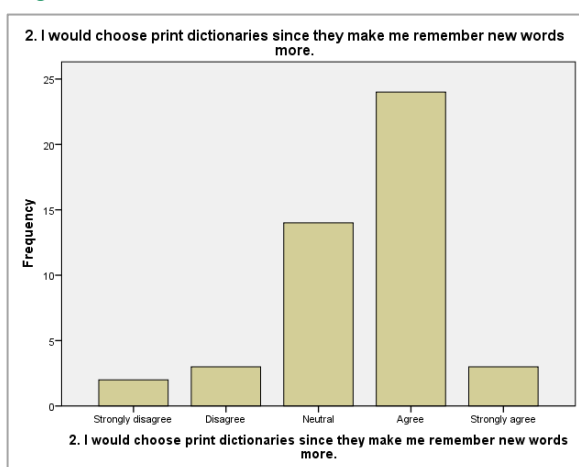
Majority (64) of the students indicated that online dictionaries are more convenient and fast than print with 20 percent being neutral and 16 percent disagreeing, indicating a great preference of online tools. This is an indicator of the immediacy trend in contemporary learning. According to Alhatmi (2019) the reasons of this preference include accessibility and ease of search, and Khan and Sibtain (2019) found that Pakistani undergraduates prefer mobile dictionaries due to their ability to retrieve words quickly and bilingual capabilities, which also is the role of accessibility in the choice of dictionaries.

Table 2

I would Choose Print Dictionaries Since they Make me Remember New Words More

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	2.7	4.3	4.3
	Disagree	3	4.1	6.5	10.9
	Neutral	14	18.9	30.4	41.3
	Agree	24	32.4	52.2	93.5
	Strongly agree	3	4.1	6.5	100.0
	Total	46	62.2	100.0	
Missing	System	28	37.8		
Total		74	74		

Figure 2



he majority of the respondents (approximately 70 of the respondents) affirmed that printed dictionaries are cumbersome and not portable, with 18 percent being indifferent

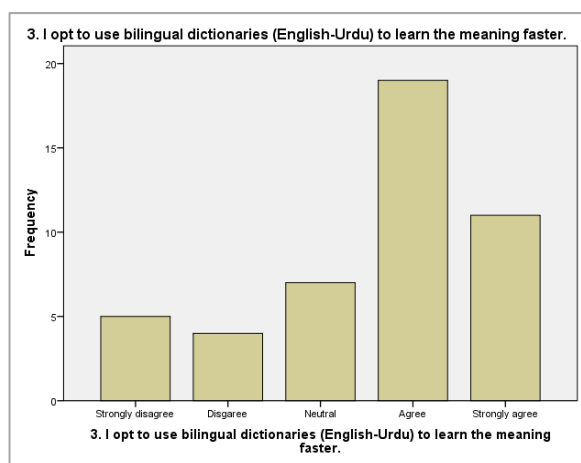
and 12 percent disagreeing with this, which means that they cannot be used in contemporary academic institutions. Abbasi et al. (2019) also discovered that mobile friendly material is the preferred choice by students who need fast and easy access, and Lew (2011) emphasized that e-dictionaries are the solution to the limitations of print, namely convenient access and multimedia capabilities, which proves the convenience in the mentioned shift.

Table 3

I Opt to Use Bilingual Dictionaries (English-Urdu) to Learn the Meaning Faster

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	5	6.8	10.9	10.9
	Disagree	4	5.4	8.7	19.6
	Neutral	7	9.5	15.2	34.8
	Agree	19	25.7	41.3	76.1
	Strongly agree	11	14.9	23.9	100.0
	Total	46	62.2	100.0	
Missing	System	28	37.8		
Total		74	100.0		

Figure 3



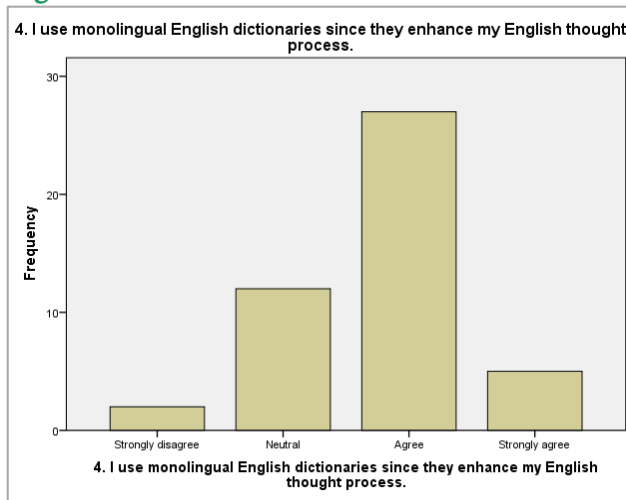
Approximately 72 percent of students affirmed that audio functions in online dictionaries are helpful, and 18 percent were neutral and only 10 percent disagreed with the statement which puts pronunciation support as a major consideration in their usage. Alharbi (2016) also concluded that e-dictionaries can be used to improve listening and speaking based on the use of pronunciation aids and examples, whereas Márkus et al. (2023) also established that pronunciation aids are some of the most appreciated features, which supports the effectiveness of multimodal features to enhance lexical learning.

Table 4

I Use Monolingual English Dictionaries since they Enhance my English Thought Process

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	2.7	4.3	4.3
	Neutral	12	16.2	26.1	30.4
	Agree	27	36.5	58.7	89.1
	Strongly agree	5	6.8	10.9	100.0
	Total	46	62.2	100.0	
Missing	System	28	37.8		
Total		74	100.0		

Figure 4



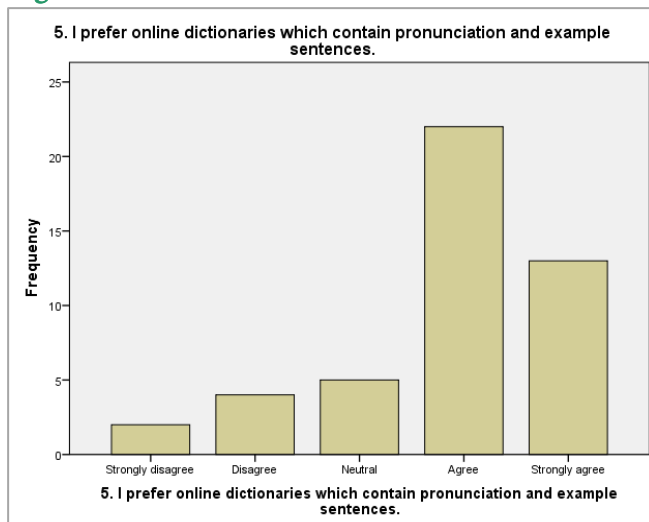
The dictionaries were found to play a significant role in reading comprehension because about 60 percent of students indicated that they used dictionaries to derive the meaning of new words when reading, with 25 percent of them accepting it, and 15 percent of them disagreeing. Zorigt and Tumurbat (2022) also discovered that e-dictionaries assist learners in word recognition and comprehension as soon as possible but deep retention is possible when guided use is employed and the reading fluency is enhanced.

Table 5

I Prefer Online Dictionaries which Contain Pronunciation and Example Sentences

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	2.7	4.3	4.3
	Disagree	4	5.4	8.7	13.0
	Neutral	5	6.8	10.9	23.9
	Agree	22	29.7	47.8	71.7
	Strongly agree	13	17.6	28.3	100.0
	Total	46	62.2	100.0	
Missing	System	28	37.8		
Total		74	100.0		

Figure 5



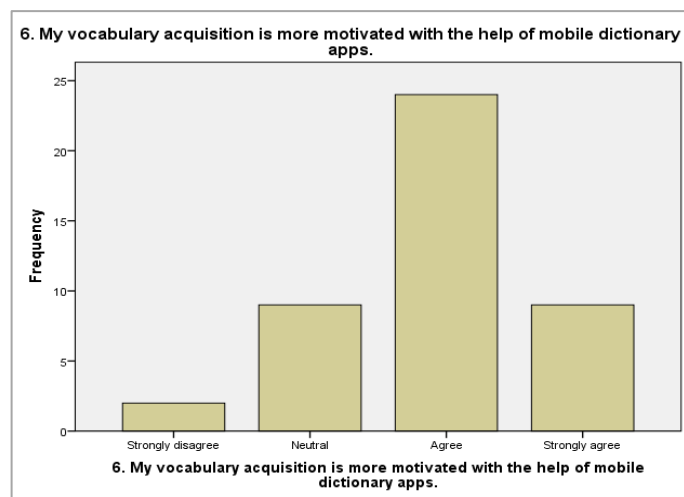
Perceived positive relationship between e-dictionaries use and vocabulary development was found by 68 percent of students with 22 percent of the students being neutral and 10 percent disagreeing. Abbasi et al. (2019) also observed the growth of vocabulary in users of online dictionaries and Lew (2011) and Alhatmi (2019) identified that e-dictionaries allow independent learning and vocabulary acquisition when used not in a superficial way.

Table 6

My Vocabulary Acquisition is more Motivated with the Help of Mobile Dictionary Apps

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	2.7	4.5	4.5
	Neutral	9	12.2	20.5	25.0
	Agree	24	32.4	54.5	79.5
	Strongly agree	9	12.2	20.5	100.0
	Total	44	59.5	100.0	
Missing	System	30	40.5		
Total		74	100.0		

Figure 6



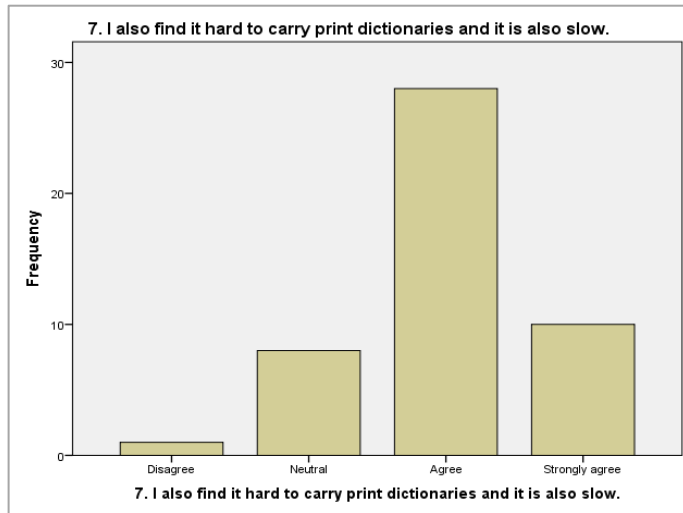
Sixty-two percent of the participants answered yes to the question of whether digital dictionaries improve vocabulary retention with 25 neutral and 13 disagree meaning that it helps in the process of reinforcing vocabulary memory by accessing the vocabulary easily and by repetition. Studies by Zorigt and Tumurbat (2022) also revealed that short-term recollection is more prominent with the use of the e-dictionary through the visual and auditory stimulus, however, long-term learning involves reflective practice, which requires conscious use of the vocabulary.

Table 7

I also Find it Hard to Carry Print Dictionaries and it is also Slow

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	1.4	2.1	2.1
	Neutral	8	10.8	17.0	19.1
	Agree	28	37.8	59.6	78.7
	Strongly agree	10	13.5	21.3	100.0
	Total	47	63.5	100.0	
Missing	System	27	36.5		
Total		74	100.0		

Figure 7



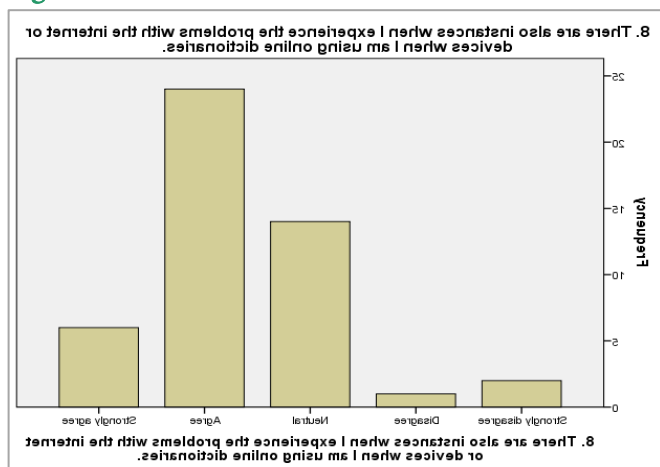
The significance of audio and phonetic properties was also indicated in the high frequency of agreement with 74 percent of participants agreeing that online dictionaries help to improve pronunciation 15 percent were neutral and 11 percent disagreed. Alharbi (2016) and Márkus et al. (2023) also found that one of the major benefits of e-dictionaries is support with pronunciation as it allows them to correct themselves, make independent practice, and enhance the speaking skills.

Table 8

There are also Instances when I Experience the Problems with the Internet or Devices when I am using Online Dictionaries

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	2.7	4.3	4.3
	Disagree	1	1.4	2.1	6.4
	Neutral	14	18.9	29.8	36.2
	Agree	24	32.4	51.1	87.2
	Strongly agree	6	8.1	12.8	100.0
	Total	47	63.5	100.0	
Missing	System	27	36.5		
Total		74	100.0		

Figure 8



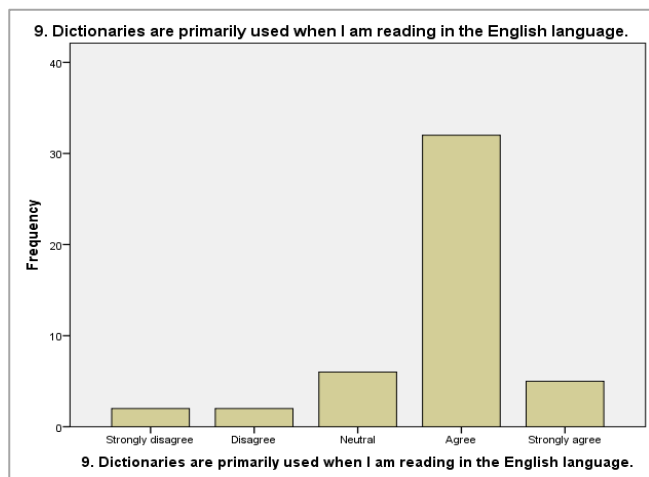
There is a strong appreciation of audio and phonetic features with majority of respondents (74 percent) agreeing that online dictionaries assist them to learn proper pronunciation, 15 percent were neutral and 11 percent disagreeing. Alharbi (2016) and Márkus et al. (2023) also found that support of pronunciation is a prominent advantage of an e-dictionary since it allows self-correction, self-practice, and oral competence.

Table 9

Dictionaries are Primarily used when I am Reading in the English Language

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	2.7	4.3	4.3
	Disagree	2	2.7	4.3	8.5
	Neutral	6	8.1	12.8	21.3
	Agree	32	43.2	68.1	89.4
	Strongly agree	5	6.8	10.6	100.0
	Total	47	63.5	100.0	
Missing	System	27	36.5		
Total		74	100.0		

Figure 9



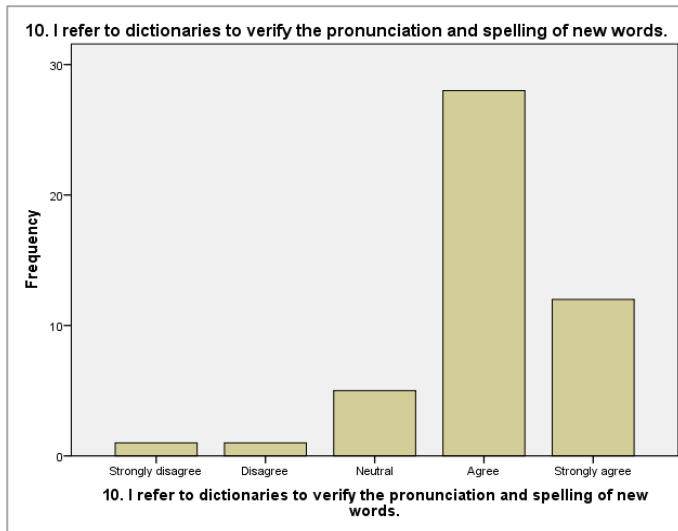
Approximately 58% of students said they used online dictionaries to get collocations and examples of context, 30% were indifferent and 12 percent disagreed, suggesting that many students are concerned with low-order meanings but not with high-level applications. This confirms Abbasi et al. (2019) and Lew (2011) result that learners disregard the usage notes and examples, and the training of dictionary strategy should be provided to develop more profound lexical competence.

Table 10

I Refer to Dictionaries to Verify the Pronunciation and Spelling of New Words

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	1.4	2.1	2.1
	Disagree	1	1.4	2.1	4.3
	Neutral	5	6.8	10.6	14.9
	Agree	28	37.8	59.6	74.5
	Strongly agree	12	16.2	25.5	100.0
	Total	47	63.5	100.0	
Missing	System	27	36.5		
Total		74	100.0		

Figure 10



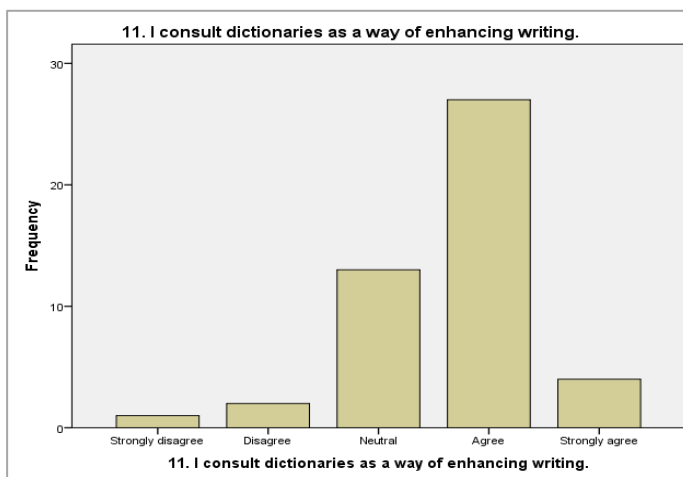
Approximately 68 percent of the students indicated that use of a print dictionary is time consuming, 20 percent had a neutral response and 12 percent had a negative response, indicating that students use quicker tools because of digital literacy. This is in line with Lew (2011) and Márkus et al. (2023) who have pointed out that e-dictionaries offer instant feedback and printed dictionaries are perceived to be obsolete and that time efficiency is a major determinant in the transition to digital sources.

Table 11

I Consult Dictionaries as a Way of Enhancing Writing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	1.4	2.1	2.1
	Disagree	2	2.7	4.3	6.4
	Neutral	13	17.6	27.7	34.0
	Agree	27	36.5	57.4	91.5
	Strongly agree	4	5.4	8.5	100.0
	Total		47	63.5	100.0
Missing	System	27	36.5		
Total		74	100.0		

Figure 11



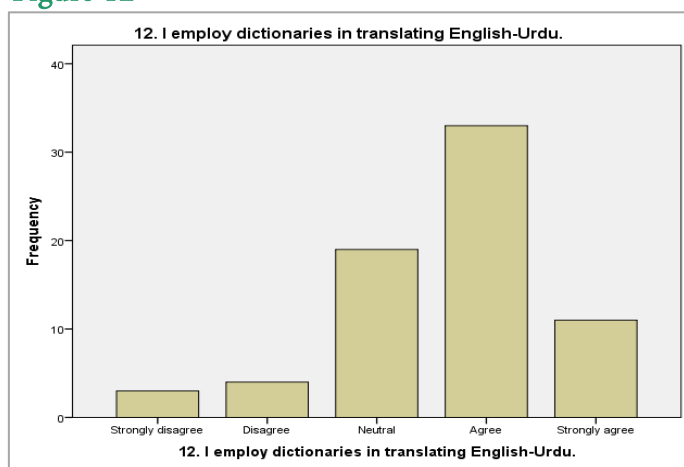
Approximately 77% of the students stated that online dictionaries are more convenient than printed ones, 15% were not indifferent, and 8 were against it, which is an important aspect of digital tools availability and flexibility. This is consistent with Abbasi et al. (2019) and Alhatmi (2019) who discovered that convenience and ease of use are the primary reasons why learners prefer online dictionaries to traditional dictionaries.

Table 12

I Employ Dictionaries in Translating English-Urdu

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	3	4.1	4.3	4.3
	Disagree	4	5.4	5.7	10.0
	Neutral	19	25.7	27.1	37.1
	Agree	33	44.6	47.1	84.3
	Strongly agree	11	14.9	15.7	100.0
	Total	70	94.6	100.0	
Missing	System	4	5.4		
Total		74	100.0		

Figure 12



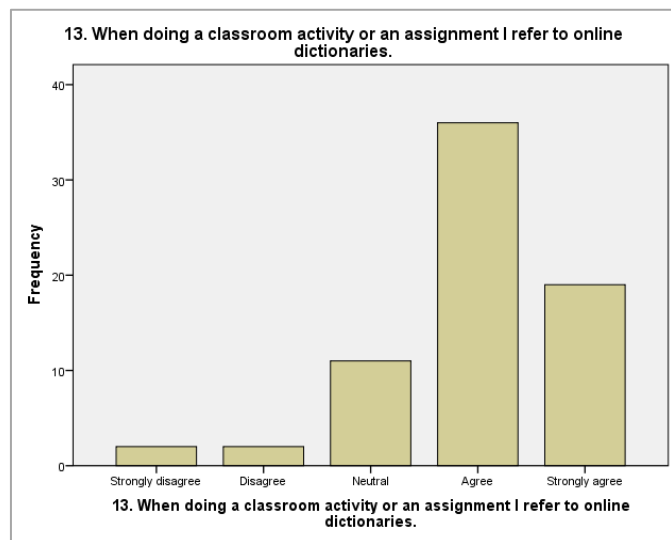
Approximately, 63 percent of learners found bilingual dictionaries better compared to monolingual dictionaries, 25 percent were indifferent, and 12 percent opposed this view, which means that they use translation to comprehend complicated words. This agrees with Abbasi et al. (2019) and Zorigt and Tumurbat (2022) who pointed out that bilingual dictionaries are beneficial to understanding but can restrict contextual and collocational learning when used excessively, which means that bilingual and monolingual materials should be used wisely to achieve positive learning outcomes in terms of lexical acquisition.

Table 13

When doing a Classroom Activity or an Assignment I Refer to Online Dictionaries

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	2.7	2.9	2.9
	Disagree	2	2.7	2.9	5.7
	Neutral	11	14.9	15.7	21.4
	Agree	36	48.6	51.4	72.9
	Strongly agree	19	25.7	27.1	100.0
	Total	70	94.6	100.0	
Missing	System	4	5.4		
Total		74	100.0		

Figure 13



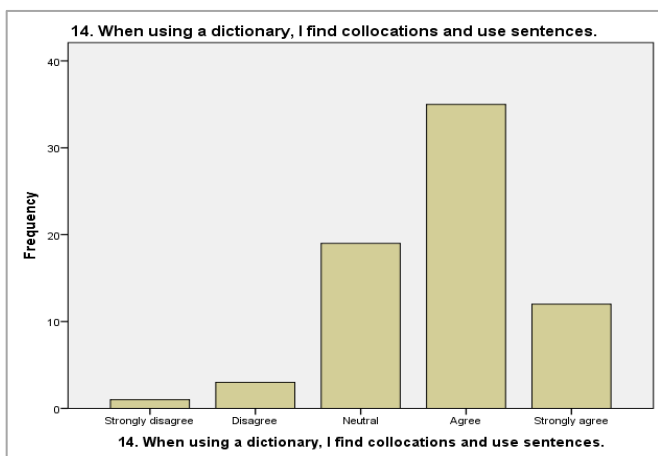
Approximately, 70 percent of the students indicated using digital dictionaries to examine pronunciation and spelling, 20 percent of them were neutral and only 10 percent of the students who responded said they do not use e-dictionaries to look up the meaning and form of words. The accuracy and confidence may be improved with the assistance of audio pronunciation, phonetic transcription, and spelling correction. This is in line with Márkus et al. (2023) and Alharbi (2016) who emphasized that these tools can facilitate oral and written proficiency and promote language acquisition rather than just vocabulary learning.

Table 14

When using a Dictionary, I Find Collocations and use Sentences

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	1.4	1.4	1.4
	Disagree	3	4.1	4.3	5.7
	Neutral	19	25.7	27.1	32.9
	Agree	35	47.3	50.0	82.9
	Strongly agree	12	16.2	17.1	100.0
	Total	70	94.6	100.0	
Missing	System	4	5.4		
Total		74	100.0		

Figure 14



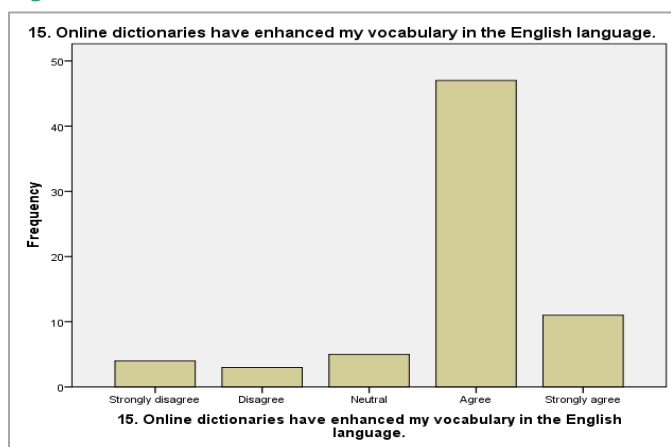
The level of agreement was 78 percent with 17 percent strongly agreeing and with 5 per cent. disagreeing, with trusted brands being preferred due to reliability, convenience and academic validity. Such apps can also have bilingual support, offline usage, and such benefits as voice search or artificial examples. This is similar to Alhatmi (2019) and Lew (2011) who pointed out that digital dictionaries that are recognized internationally are preferred due to their reliability, multimedia support capabilities, and language accuracy, and therefore their central role in the digital learning of students.

Table 15

Online Dictionaries have Enhanced my Vocabulary in the English Language

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	4	5.4	5.7	5.7
	Disagree	3	4.1	4.3	10.0
	Neutral	5	6.8	7.1	17.1
	Agree	47	63.5	67.1	84.3
	Strongly agree	11	14.9	15.7	100.0
	Total	70	94.6	100.0	
Missing	System	4	5.4		
Total		74	100.0		

Figure 15



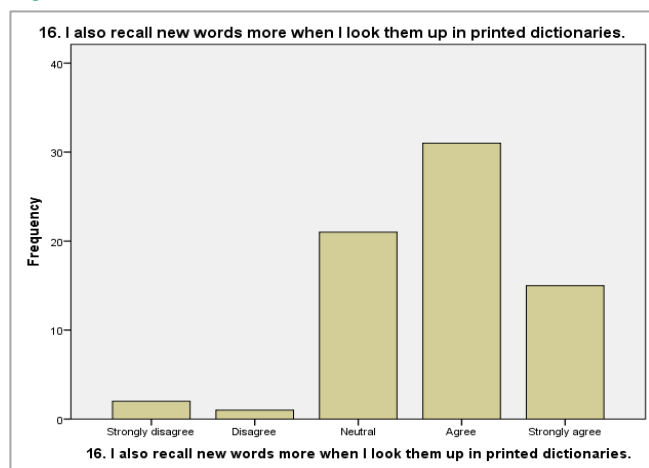
Students (n=66) indicated that example sentences in online dictionaries help in understanding and remembering vocabulary with 66% of students reporting that having an example sentence is helpful in learning vocabulary and 24% reported that it is neutral, and 10% disagreed with the importance of example sentence. This is consistent with the findings of Zorigt and Tumurbat (2022) that examples positively affect incidental vocabulary learning and with those by Abbasi et al. (2019) who established that e-dictionaries have an advantageous effect on lexical retention by promoting better semantic and syntactic knowledge.

Table 16

I also Recall New Words more when I Look them up in Printed Dictionaries

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	2.7	2.9	2.9
	Disagree	1	1.4	1.4	4.3
	Neutral	21	28.4	30.0	34.3
	Agree	31	41.9	44.3	78.6
	Strongly agree	15	20.3	21.4	100.0
	Total	70	94.6	100.0	
Missing	System	4	5.4		
Total		74	100.0		

Figure 16



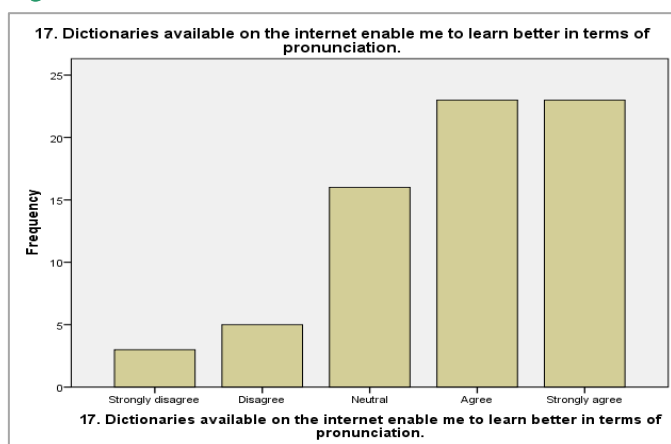
Digital dictionaries were revealed to be more interesting to approximately 69 percent of students, neutral to 21 percent, and disagreed by 10 percent, meaning that interactivity, color, audio and instant search make them appealing to contemporary students. This is in line with Alhatmi (2019) and Márkus et al. (2023) who indicated that multimedia features and basic design of digital information increase engagement, attention, and motivation, so interactivity and design play a central role in the online dictionaries preference of students.

Table 17

Dictionaries Available on the Internet Enable me to Learn Better in Terms of Pronunciation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	3	4.1	4.3	4.3
	Disagree	5	6.8	7.1	11.4
	Neutral	16	21.6	22.9	34.3
	Agree	23	31.1	32.9	67.1
	Strongly agree	23	31.1	32.9	100.0
	Total	70	94.6	100.0	
Missing	System	4	5.4		
Total		74	100.0		

Figure 17



Approximately 73% of the students said that they used online dictionaries to read and write, 17% were ambivalent and 10% disagreed which means that digital dictionaries have become key learning tools and no longer luxuries.

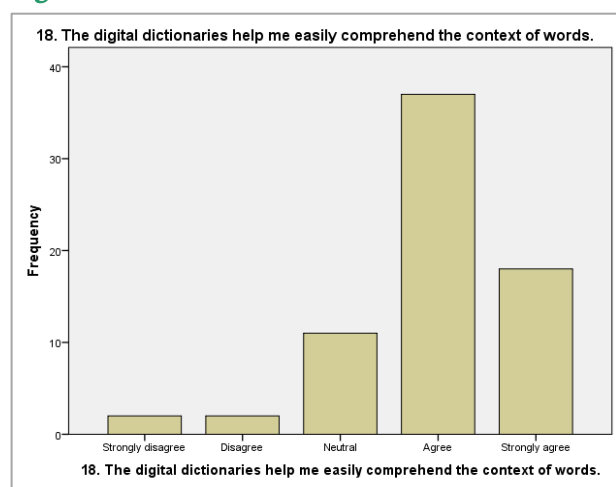
Their immediate feedback and example-mediated explanations support academic work and reading comprehension, which agrees with Abbasi et al. (2019) and Lew (2011) as well, who emphasized their use in the interactive vocabulary support in the context of reading and writing processes.

Table 18

The Digital Dictionaries help me Easily Comprehend the Context of Words

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	2.7	2.9	2.9
	Disagree	2	2.7	2.9	5.7
	Neutral	11	14.9	15.7	21.4
	Agree	37	50.0	52.9	74.3
	Strongly agree	18	24.3	25.7	100.0
	Total	70	94.6	100.0	
Missing	System	4	5.4		
Total		74	100.0		

Figure 18



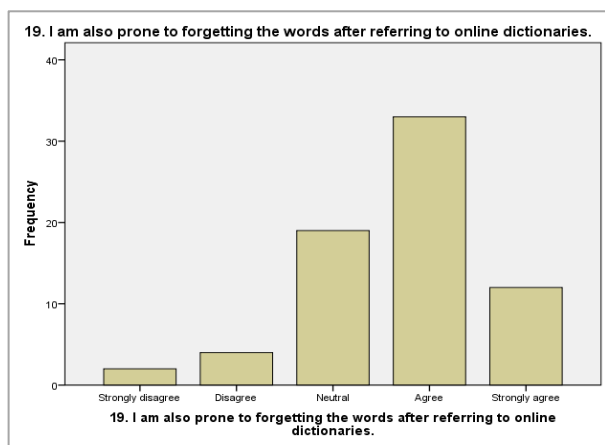
Approximately, 64 percent of the students affirmed that online dictionaries assisted them to use words properly in sentences, 23 percent were indifferent, and 13 percent opposed this assertion, and contextual instances, grammatical notes, and collocations improve syntactic awareness. This is in line with Zorigt and Tumurbat (2022) and Márkus et al. (2023) who concluded that contextualized digital dictionaries are effective in the construction of sentences and communicative competence and thus valuable in contextual learning.

Table 19

I am also Prone to Forgetting the Words after Referring to Online Dictionaries

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	2.7	2.9	2.9
	Disagree	4	5.4	5.7	8.6
	Neutral	19	25.7	27.1	35.7
	Agree	33	44.6	47.1	82.9
	Strongly agree	12	16.2	17.1	100.0
	Total	70	94.6	100.0	
Missing	System	4	5.4		
Total		74	100.0		

Figure 19



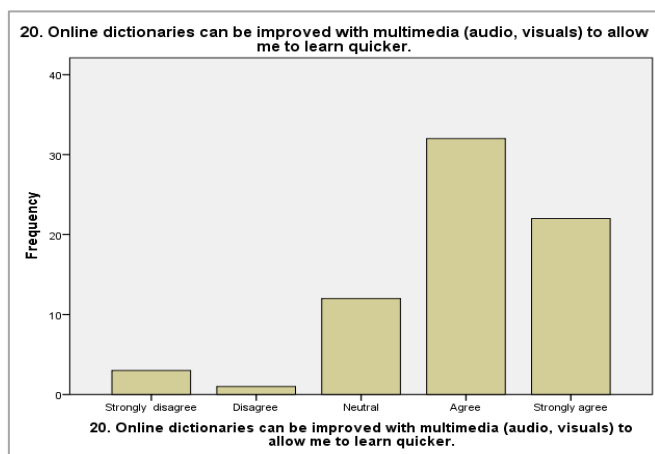
The results showed that approximately 71 percent of students had confidence in online dictionaries because they believed in the accuracy of the definitions, 19 percent were indifferent, and 10 percent did not, which demonstrates that people have high confidence in using online resources because of the credibility of preeminent publishers such as Oxford, Cambridge, and Google. This is consistent with Alhatmi (2019) and Abbasi et al. (2019) who discovered that students rely on e-dictionaries as a source of their professional information and frequent updates, so perceived reliability is one of the determinants of their further use.

Table 20

Online Dictionaries can be Improved with Multimedia (Audio, Visuals) to Allow me to Learn Quicker

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	3	4.1	4.3	4.3
	Disagree	1	1.4	1.4	5.7
	Neutral	12	16.2	17.1	22.9
	Agree	32	43.2	45.7	68.6
	Strongly agree	22	29.7	31.4	100.0
	Total	70	94.6	100.0	
Missing	System	4	5.4		
Total		74	100.0		

Figure 20



Approximately 80% of students considered speed as a significant benefit of online dictionaries, 12% were indifferent and 8% believed there to be no benefit at all, proving that access to definitions and translations within seconds is

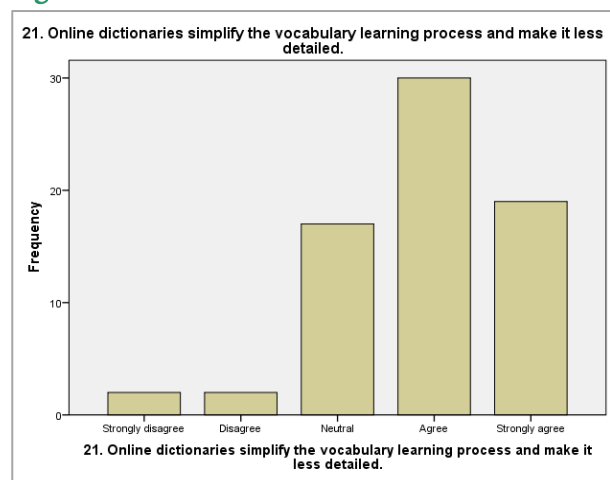
one thing that meets the efficiency requirements of learners, particularly when they are undergoing examinations or assignments. It makes the claim by Lew (2011) and Abbasi et al. (2019) more productive, as they emphasized that digital dictionaries are more efficient compared to print sources due to faster retrieval and lower search effort.

Table 21

Online Dictionaries Simplify the Vocabulary Learning Process and Make it Less Detailed

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	2.7	2.9	2.9
	Disagree	2	2.7	2.9	5.7
	Neutral	17	23.0	24.3	30.0
	Agree	30	40.5	42.9	72.9
	Strongly agree	19	25.7	27.1	100.0
	Total	70	94.6	100.0	
Missing	System	4	5.4		
Total		74	100.0		

Figure 21



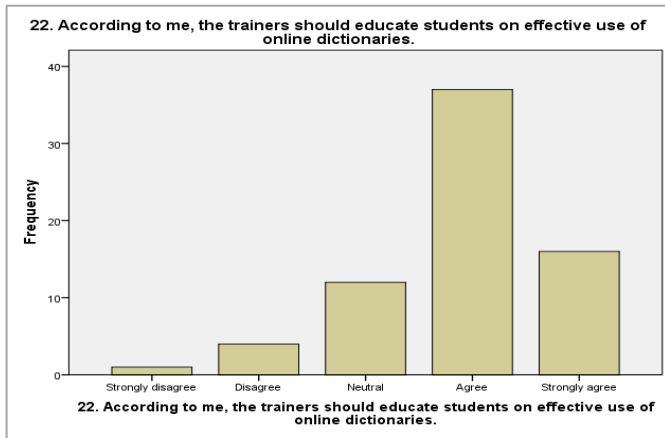
Considering the 69 percent of students found that vocabulary learning was simpler with the help of an online dictionary, 24 percent were neutral, and 6 percent disagreed that simplified definitions, collocations, and examples are less taxing and enhance comprehension and use. This is in agreement with Abbasi et al. (2019) and Lew (2011), who established that concise version of e-dictionaries is more efficient and effective in learning a language.

Table 22

According to me, the Trainers should Educate Students on effective use of Online Dictionaries

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	1.4	1.4	1.4
	Disagree	4	5.4	5.7	7.1
	Neutral	12	16.2	17.1	24.3
	Agree	37	50.0	52.9	77.1
	Strongly agree	16	21.6	22.9	100.0
	Total	70	94.6	100.0	
Missing	System	4	5.4		
Total		74	100.0		

Figure 22



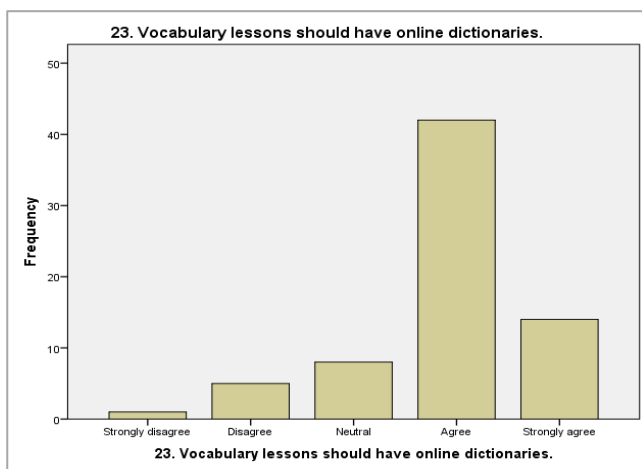
Approximately 73 percent of students said teachers ought to give instructions concerning use of online dictionaries, 17 percent were none, and seven percent said no indicating that students were aware of the need to be trained to maximize the benefits of e-dictionaries. This compares with Zorigt and Tumurbat (2022) and Alhatmi (2019) who stated that instructor teaching and training is a way of ensuring that lexical knowledge is effectively used, confidently, and correctly.

Table 23

Vocabulary Lessons should have Online Dictionaries

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	1.4	1.4	1.4
	Disagree	5	6.8	7.1	8.6
	Neutral	8	10.8	11.4	20.0
	Agree	42	56.8	60.0	80.0
	Strongly agree	14	18.9	20.0	100.0
	Total	70	94.6	100.0	
Missing	System	4	5.4		
Total		74	100.0		

Figure 23



Supporting the use of online dictionaries during vocabulary instruction was 80% of the students, disagreements were 11.4%, and in the middle were 8.5% indicating their interest in using digital tools in classrooms. This is in line with

Abbasi et al. (2019) and Lew (2011) who reported that the incorporation of e-dictionaries is positively associated with vocabulary activities, instant clarification, and interactive learning, which leads to the respective enhancements of learner autonomy and the teaching process.

Table 24

I believe that Online Dictionaries Promote Self-learning

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	3	4.1	4.3	4.3
	Disagree	2	2.7	2.9	7.1
	Neutral	14	18.9	20.0	27.1
	Agree	35	47.3	50.0	77.1
	Strongly agree	16	21.6	22.9	100.0
	Total	70	94.6	100.0	
Missing	System	4	5.4		
Total		74	100.0		

Figure 24



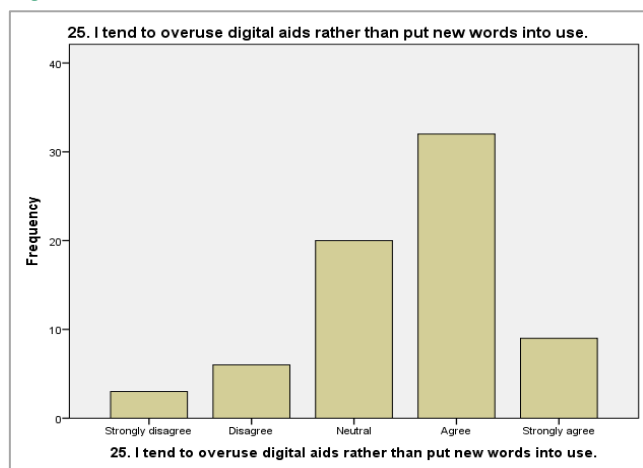
On the one hand, approximately 70% of students respondents answered that online dictionaries facilitate self-directed learning, 20% indicated that they were neutral, and 7.2% students indicated that they disagree with the claim that online dictionaries facilitate self-directed learning. This conforms to Márkus et al. (2023) and Alhatmi (2019) as both noted that e-dictionaries facilitate independence in vocabulary learning, critical thinking and critical thinking through instant feedback and contextualization.

Table 25

I Tend to Overuse Digital Aids Rather than Put new Words into Use

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	3	4.1	4.3	4.3
	Disagree	6	8.1	8.6	12.9
	Neutral	20	27.0	28.6	41.4
	Agree	32	43.2	45.7	87.1
	Strongly agree	9	12.2	12.9	100.0
	Total	70	94.6	100.0	
Missing	System	4	5.4		
Total		74	100.0		

Figure 25



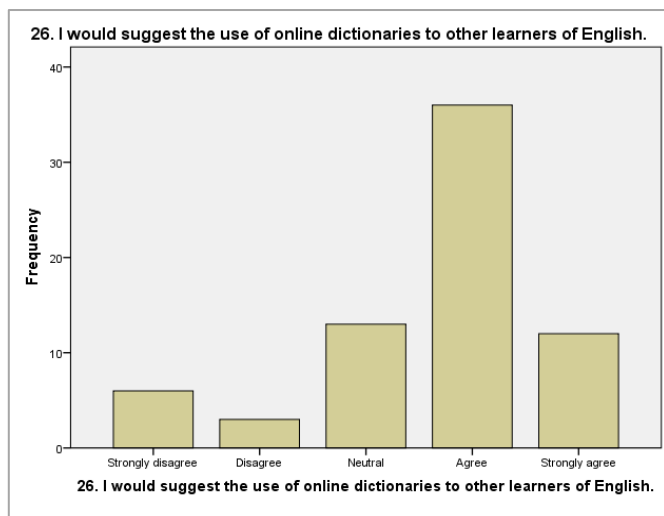
Approximately half of the students (56 percent) confessed that they sometimes use digital dictionaries rather than work on new words, 28.6 percent were indifferent, and 13 percent did not agree. This points to the weakness of online dictionaries because convenience can minimize the long-term vocabulary. Lew (2011) and Zorigt and Tumurbat (2022) also warn that to make externalization of vocabulary effective, it should be internalized with the help of moderation, regulation, and active use

Table 26

I would Suggest the use of Online Dictionaries to other Learners of English

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	6	8.1	8.6	8.6
	Disagree	3	4.1	4.3	12.9
	Neutral	13	17.6	18.6	31.4
	Agree	36	48.6	51.4	82.9
	Strongly agree	12	16.2	17.1	100.0
	Total	70	94.6	100.0	
Missing	System	4	5.4		
Total		74	100.0		

Figure 26



On average, 68.5% of students said that they would recommend using online dictionaries to their colleagues, 18.6% said that they were neutral, and 12.9% said they would not. This means that their total satisfaction regarding utility, convenience and learning support is high. Abbasi et al. (2019) and Alhatmi (2019) also mention that positive peer recommendations promote the culture of digital learning and increase the perceived credibility and use of e-dictionaries.

Interpretation of Interview Responses

Thematic analysis of interview data was done by systematic analysis. The responses were transcribed and read to get the perception of the participants about the use of the dictionaries, and then the meaningful units (e.g., easy to use, faster, poor retention) are presented and coded based on open coding guided by TAM and LUT (e.g., quick access, ease of use, academic reliability). These codes were categorized into digital convenience, superficial use and reliability of print dictionaries which were narrowed down to concise themes. In general, it was revealed that the majority of learners choose to use online dictionaries because of their fast and convenient use.

Theme 1: Use of Digital Dictionaries because of the Convenience of use and Access

The majority of participants favored the use of digital dictionaries due to a fast and convenient search, the possibility of accessing such dictionaries at any place, and the ability to find any meaning, examples, and pronunciation at a moment. As an example, one interviewee claimed to find them convenient and fast, whereas another commented on the possibility to find any word anywhere on their phone. This is an indication of the Technology Acceptance Model (TAM) especially perceived usefulness and ease of use whereby time-saving and less effort is the motivating factor behind student preference.

Theme 2: The Role of Digital Dictionaries in Vocabulary Learning and Pronunciation Improvement

Digital dictionaries were reportedly helpful by most of the participants in the enhancement of vocabulary and pronunciation by use of audio, examples, and repetition. As an illustration, respondents mentioned that they were able to hear and repeat the correct pronunciation. This is in compliance with Lexicographical Use Theory, which emphasized the capability of multimedia to enhance receptive vocabulary and accuracy, but has been reported to have weaker long-term retention despite more rapid learning.

Theme 3: Superficial Vocabulary Processing with the use of Digital Dictionaries

The shallow learning was also noted by some participants who concentrated on the first meanings and did not pay attention to the examples or usage. As an example, one observed learning only the simplest meaning, whereas another one emphasized less profound development of vocabulary. This is indicative of Lexicographical Use Theory in which cognitive processing is possible only through conscious effort and digital convenience can cause superficial vocabulary acquisition.

Theme 4: Academic Reliability and Academic Focus as a Tool of Printed Dictionaries

Although digital tools were popular among the study participants, a segment of the respondents believed in use of printed dictionaries to prepare exams and study more, as they were more concentrated and understood. To illustrate, one had less distractions and better understanding. This colludes the Lexicographical Use Theory (LUT), which argues that print dictionaries stimulate slower and deeper processing, and that preference to a dictionary varies according to the academic environment and is not just a matter of format.

Theme 5: Mobile Convenience Influence on Vocabulary Learn Motivation

The respondents noted that mobile dictionaries apps made them more motivated to study vocabulary because they can always use them in their free time or even during breaks. An example is that one of the studies observed a few minutes a day. This is in line with the Technology Acceptance Model (TAM) in which ease of use and access increases motivation and use.

Validity and Transparency

To make the data analysis process valid and transparent, a clear thematic analysis process was applied. The data were derived in terms of codes and themes in a systematic way accompanied by quotes of participants. Combining the two theoretical frameworks: the TAM and the Lexicographical Use Theory has offered a solid theoretical basis on which the findings could be interpreted, thus making the study more credible.

Key Findings

Students have a great preference towards online dictionaries as they are more accessible, faster, portable, and interactive with audio and sample sentences, which aids reading, writing, speaking, and self-directed learning. Nevertheless, the advanced features (e.g., collocations) are not used by many students, and they use direct meanings, which implies that they should be guided to use them.

Qualitative results indicate that ease and instant access to digital dictionaries is more popular with students, which is aligned with TAM (perceived usefulness and ease of use) and better vocabulary and pronunciation with the help of audio and examples, which is in line with Lexicographical Use Theory. These advantages notwithstanding, there is still superficial learning and less attention to context in terms of long-term retention. Print dictionaries are still considered more profound and more trustworthy particularly in exams.

On the whole, the quantitative and qualitative findings reveal the advantages (speed, motivation, pronunciation) and disadvantages (shallow learning) of learning vocabulary, and it is possible to assume that the balanced and guided use of both digital and print dictionaries is the only way to learn vocabulary effectively.

Conclusion

This paper has explored the increased adoption of online dictionaries among Pakistani higher education learners and the effect it has on the lexical acquisition process. Results indicate that the dictionaries on the internet are often preferred because of accessibility, speed, portability, and multimedia capabilities, which are consistent with TAM (perceived usefulness and ease of use). They have a positive effect on short-term vocabulary recognition, pronunciation, reading fluency, and learner motivation, and promote autonomy in accordance with Constructivist Learning Theory. But online preference does not guarantee deep learning, since most students are paying attention to direct senses, not collocations, context and grammar and print dictionaries invite deeper processing and memorization. The findings indicate that good vocabulary acquisition is more about use as opposed to the medium. Thus, pedagogical assistance is a necessity, such as explicit training in dictionaries, in reflexivity, and alternative utilization of both digital and print materials. On the whole, the strategic use of digital dictionaries may facilitate both short-term and long-lasting vocabulary acquisition that is meaningful, which has significant implications on teachers, curriculum developers, and researchers.

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