

Foreign Language Learners' Use and Perception of Online Dictionaries: A Survey Study

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Abstract

The importance of dictionaries in language learning is indisputable. The emergence of online dictionaries has noticeably influenced the way students learn a foreign language (FL). This study examines FL learners' use and perception of bilingual online dictionaries through an analysis of over 250 responses to a web-based survey from learners enrolled in postsecondary language courses in the United States. The most popular online dictionaries among eight languages are presented along with self-reported data regarding look-up behaviors while reading, writing, listening, and speaking the target language. The results suggest that online dictionaries are most often consulted when learners are creating and/or deciphering digitally mediated written texts. Although most FL learners consider online dictionaries to be an essential part of their language learning, they report that not all are reliable. They also report the disparity of quality in online dictionaries across languages. As a result, learners often use multiple online dictionaries and other digital resources for multiple purposes. Based on the findings, pedagogical suggestions are provided to help educators guide FL learners' use of online dictionaries and other digital resources such as online translators.

Keywords: computer-assisted language learning (CALL), foreign language learning, online dictionaries, online translators, Google, Google Translate, digital resources

Introduction

The emergence and development of online resources have affected all fields of education, including foreign language (FL) learning. The majority of FL learners enrolled in college-level language classes in the United States are digital natives (Prensky, 2001), having grown up in an increasingly digitally connected world with immediate access to authentically created and situated texts in various languages and with the convenience of virtual intercultural communication. The emergence of digital and Internet tools have been reshaping views of what FL proficiency is and how to teach and learn a FL (Blake, 2008; Chapelle, 2001, 2009; Murray, 2000; Ortega, 1997). FL educators must address the use of digital resources by FL learners and understand how their language learning and educators' own teaching may benefit from such tools.

The emergence of technological tools has "provide[d] new opportunities for self-directed learning" (Godwin-Jones, 2011, p. 4). One category of these tools is online dictionaries that scaffold language learning both within and outside of the classroom. Few empirical studies have been conducted to understand how FL learners use online dictionaries, despite their popularity. The existing studies on

online dictionary use in FL learning mainly focused on the advantages of using online dictionaries for vocabulary acquisition in reading and writing tasks (Chun, 2001; Elola, Rodriguez-Garcia, & Winfrey, 2008; Hulstijn, Hollander, & Greidanus, 1996; Lan, 2005; Laufer & Hill, 2000). This study's aim was to uncover college-level FL learners' use and perceptions of bilingual online dictionaries in FL learning in a variety of tasks and thereby contextualize the pedagogical implications of the use of these online tools to either facilitate online learning or complement classroom-based learning. In this paper, bilingual online dictionaries include those that can be accessed via websites or through apps in mobile devices.

Literature Survey

When examining online bilingual dictionaries, it is important to first identify what is considered a dictionary and what general functions bilingual dictionaries serve in FL learning. To shed light on what has already been investigated about online dictionary use and what has yet to be explored, a review of recent empirical studies on the use of online dictionaries in FL learning will follow.

Dictionary use has been a widely explored topic for over a century for the purpose of both first language (L1) and second language (L2) learning (Lew, 2011). While Miller (1999) acknowledges that dictionaries provide a wealth of important information about a word, he cautions, "dictionary definitions are deliberately decontextualized" (p.10). McAlpine and Myles (2003) clarify the role of the dictionary in basic language learning: to assist learners in broadening their vocabulary knowledge and understanding of common grammatical errors. Indeed, findings from research studies (Hulstijn, Hollander, & Greidanus, 1996; Knight, 1994; Luppescu & Davy, 1993) suggest that dictionary use is beneficial for L2 learners' vocabulary expansion and for eventual reading comprehension. In particular, dictionary use helps learners build form-meaning connections. However, researchers (Ghabanchi & Ayoubi, 2012) also caution that dictionary use among FL learners is not significantly more effective for incidental vocabulary learning than other reading conditions, such as L1 and L2 marginal glosses and summary writing. Other researchers (Christianson, 1997; Gonzalez, 1999; Lew, 2011) stress the influence of learners' L2 proficiency and their dictionary use strategies on their successful use of dictionaries. Higher-proficiency learners tend to employ a wider variety of strategies, and they seek semantic meanings rather than merely lexical forms and meanings. Thus, in FL education, emphasis should also be placed on appropriate training in how to use dictionaries to maximize language development.

In recent years a wealth of digital dictionaries has appeared because of expansion of the Internet and new media technologies. Onelook.com indexed the existence of 1,062 online dictionaries in April 2012, a substantial, but not surprising, increase from 188 in 1997. Lan (2005) documented 13 English-language online dictionaries with quality as good as or better than that of paper dictionaries. Furthermore, the strength of these online dictionaries lies in their innovativeness, which includes their convenience, quick updates, interactivity, and potential for designer/user collaboration.

Empirical studies have been conducted to investigate whether and how the use of online dictionaries benefits L2 development. In his review of 206 papers published from 2001 to 2005 in four major technology and language learning journals, including *CALICO Journal*, *CALL*, *Language Learning and Technology*, and *ReCALL*, Stockwell (2007) discovered that the use of online dictionaries had been primarily investigated in the context of vocabulary learning and writing. Laufer and Hill (2001) found that the use of electronic dictionaries had a positive effect on learners' incidental vocabulary learning, probably attributed to the wealth of contextual information provided by electronic dictionaries, including L1 translations, L2 synonyms, and audio files providing models for pronunciation.

Differences between language learners of different proficiencies have been explored. Chun's (2001) study revealed that lower-level learners may be overwhelmed or confused by the multiple and nonspecific word definitions provided in online dictionaries. This finding was confirmed in Lenders' (2008) and Loucky's (2010) studies, which determined that a simplified bilingual glossary facilitated L2 readers with lower proficiency levels, whereas more advanced learners benefited from electronic dictionaries which provide more details of language use, including examples of contextualized use and grammatical explanations. In addition, Prichard (2008) found evidence that L2 readers at lower proficiency levels lack efficient reading strategies and look up a large number of words that are not central to deciphering the central meaning of texts in the target language.

Research findings suggest that online dictionaries that offer more contexts of usage lead to more successful language use by second language learners (Cárdenas-Claros & Gruba, 2009; Jones, 2003; Kaur & Hegelheimer, 2005). Elola, Rodríguez-García, and Winfrey's (2008) study revealed that second language users' lookup strategies (e.g., lexical versus semantic) combined with proficiency levels shaped their success in using online dictionaries for vocabulary choices in Spanish writing tasks. Two recent empirical studies revealed that advanced technologies enable online dictionaries to offer adaptive and dynamic scaffolding based on learner lookup history to assist learners' vocabulary learning (Arispe, 2012; Dang, Chen, Dang, & Li, 2013). It is noteworthy that these features have not been widely integrated in most online dictionaries yet.

The literature reviewed above demonstrates that online dictionaries can be beneficial for FL learning. From a sociocultural theoretical perspective (Lantolf & Thorne, 2006; Vygotsky, 1978), the L2 learner's developmental process moves from being object-regulated (learner's language proficiency is influenced by the object used), to being other-regulated (learner's language behavior is controlled by others), to, eventually, being self-regulated (learners know what to do with and how to use language to achieve personal and social purposes). Therefore, skillful use of online dictionaries is one of the indicators of FL learners' self-regulation and consequently of successful language development (Elola, Rodríguez-García, & Winfrey, 2008). Most empirical studies have focused on learners' use of online dictionaries for vocabulary learning, particularly to augment literary skills. Few studies have investigated whether and how FL learners use online dictionaries, which devices they use, and their purposes and strategies for using dictionaries to support tasks such as listening and speaking. Even fewer studies have been conducted to report the usefulness of online dictionaries in self-directed learning from the perspective of FL learners (Godwin-Jones, 2011). Only with appropriate understanding of learners' current use will FL educators be able to provide helpful guidance to enhance the use of the tools.

This survey study aimed to fill this gap by answering the following research questions:

1. What online dictionaries do FL learners use?
2. How do FL learners use online dictionaries for reading, writing, listening, and speaking?
3. How do FL learners perceive the role of online dictionaries?

Methods

Study Context and Participants

In recent research studies (e.g., Elola, Rodríguez-García, & Winfrey, 2009; Laufer & Hill, 2001; Lei, 2009), language learners' use of online dictionaries has been investigated by examining user data such as log files or recorded screen activities. To widen the investigation of online dictionary use to a larger number of FL learners, this study adopted a survey design to gather information about language learners' self-reported use and perceptions of online dictionaries.

The web-based survey (see Appendix A) was hosted by an online survey server: [SurveyMonkey.com](https://www.surveymonkey.com). The survey link (<https://www.surveymonkey.com/s/HXYM2VK>) was distributed to language learners enrolled in FL courses in colleges and universities across the United States. The data collection took place in the fall of 2010. The survey contained a total of 17 questions inquiring about respondents' native language(s); the language course(s) in which they were enrolled; the level of their current foreign language course(s); whether and how often they used online dictionaries; what types of online dictionaries they used; how they used online dictionaries when conducting reading, writing, listening, or speaking tasks in the FL; and how they perceived the role of online bilingual dictionaries in FL learning. The survey link was posted on major foreign language professional forums such as the Chinese Language Teachers Association and the American Association of University Supervisors and Coordinators. Instructors contacted via these means forwarded the link to their respective students.

Data Analysis

The data analysis consisted of two phases. The first phase focused on a descriptive analysis of the quantitative data. In this phase, data collected from the web-based survey were grouped in terms of the respondents' native language background, the FL they were learning, the type of FL classes in which they were enrolled, the types of online dictionaries they used, frequency of consulting online dictionaries,

and the devices they used to access online dictionaries. These data were then tallied and calculated for the percentages. The findings at this phase helped answer Research Question 1.

Phase 2 consisted of a more detailed text analysis of the qualitative data regarding five issues: (1) how respondents use online dictionaries for reading; (2) how they use online dictionaries for writing; (3) how they use online dictionaries for listening; (4) how they use online dictionaries for speaking; and (5) how respondents perceive the role of online bilingual dictionaries for FL learning. The constant comparison method (Glaser & Strauss, 1967; Strauss & Corbin, 1990) was adopted in this phase. Four steps were taken to conduct text analysis for each issue. In Step 1, the researchers inspected all of the data collected from each question to identify recurring themes for analysis. Step 2 involved grouping all relevant data under those themes. The constant comparison method was used to avoid redundant and/or mislabeled themes. In Step 3, the researchers created a coding scheme for each recurring theme. Step 4 entailed calculation of the frequency of each theme. To achieve inter-rater reliability, both researchers completed Steps 1 through 4 individually. After completing Step 4, the researchers compared their individual findings. To resolve discrepancies, the researchers retrieved and reanalyzed the raw data until agreement was reached. The researchers analyzed all data across languages. The analysis helped answer Research Question 2.

Finally, the researchers sorted the data by the language studied to examine which online dictionaries learners of each FL reported using. Additionally, the researchers analyzed self-reported perceptions of online dictionaries for each language subgroup. The researchers then compared and contrasted the findings from each language to identify whether any differences existed among learners of other foreign languages in terms of perceptions of online dictionary use. The analysis in this step helped answer Research Question 3.

Results

Participant Backgrounds

At the end of the data collection period, a total of 317 surveys were completed. However, only 265 respondents identified the foreign language(s) they were learning during the survey period. Thus, 52 responses were considered incomplete and were discarded. The data reveal that 87.5% of respondents reported using online dictionaries. Although our survey sample is one of convenience, the large number suggests that online dictionaries are popular among FL learners enrolled in classes at the postsecondary level. Therefore, students' use and perception of them warrant further examination.

The complete surveys represent a total of 18 foreign languages taught in the United States. Thirty-three (12.5%) respondents reported learning two or more foreign languages simultaneously. Table 1 shows the detailed population of foreign language learners surveyed in this study.

Table 1

Foreign languages surveyed in the study (265 respondents)

Language	Number	Percentage
American Sign Language (ASL)	1	0.3%
Arabic	8	3.0%
Chinese	25	9.4%
Czech	1	0.3%
French	104	39.2%
German	25	9.4%
Hebrew	1	0.3%

Italian	9	3.4%
Japanese	26	9.8%
Korean	1	0.3%
Latin	1	0.3%
Maori	1	0.3%
Polish	1	0.3%
Portuguese	2	0.8%
Russian	4	1.5%
Spanish	88	33.2%
Turkish	1	0.3%

The respondents were enrolled in various types of language classes. Table 2 shows that the respondents evenly represented FL learners enrolled across all four levels of college-level foreign language programs in the United States with a four-year curriculum.

Table 2

Classes in which the respondents were enrolled (263 respondents)

Language Class	Number	Percentage
1 st -year Language Class	66	25.1%
2 nd -year Language Class	87	33.1%
3 rd -year Language-based Class	69	26.2%
3 rd -year Content-based Class	35	13.3%
4 th -year Language-based Class	27	10.3%
4 th -year Content-based Class	30	11.4%
Others (e.g., independent study, intensive language classes)	12	4.6%

The background information reported above indicates the FL respondents surveyed in this study represent a wide variety of perspectives among the general population of college-level FL learners in the United States. The specific findings for each research question are presented in detail in the following section.

Question 1: What online dictionaries do FL learners use?

A detailed list of online dictionaries reported by 211 language learners of Arabic, Chinese, French, German, Italian, Japanese, Russian, and Spanish is shown in Table 3. It shows that wordreference.com and Google, including the Google search engine and Google Translate, are the two most frequently mentioned online dictionaries and tools across all languages. However, learners of each language demonstrated a preference for somewhat different online dictionaries. For example, learners of Spanish

and French preferred wordreference.com, whereas learners of Chinese used nciku.com more frequently. It is also noteworthy that most online dictionaries reported by the respondents provide dictionary assistance for multiple languages (e.g., Google, wordreference.com, lexilogos.com, and dict.leo.org), but some dictionaries serve one FL exclusively (e.g., nciku.com). The latter are marked with * in Table 3.

Table 3

Language learners' preferences for online dictionaries (211 respondents)

Language	Online dictionary	% reported by participants
Arabic (n=5)	Google (Google Translate specified)	40 (40)
	Wordreference.com	20
Chinese (n=16)	nciku.com *	56
	Google (Google Translate specified)	25 (25)
	Mdbg.net *	18.8
French (n=84)	Wordreference.com	62
	Google (Google Translate specified)	26.2 (16.7)
	Lexilogos.com	7.1
German (n=21)	Dict.leo.org	63.6
	Google (Google Translate specified)	19 (4.8)
	Wordreference.com	14.3
Italian (n=6)	Wordreference.com	66.7
	Google (Google Translate specified)	33.3 (16.7)
	SDL Free Translator	16.7
Japanese (n=16)	Babelfish	25
	Google (Google Translate specified)	18.8 (6.3)
	Jisho.org *	18.8
Russian (n=4)	Dictionary.com	25
	Wordreference.com	25
	Dict.leo.org	25
Spanish (n=80)	Wordreference.com	53.8
	Google (Google Translate specified)	15 (6.3)
	Spandict.com *	12.5

Question 2: How do FL learners use online dictionaries for reading, writing, listening, and speaking?

This question was addressed from various aspects of online dictionary use. First, as shown in Table 4, most respondents used online dictionaries frequently—at least once a week.

Table 4

Frequency of consulting online dictionaries (224 Respondents)

Consultation Frequency	Number	Percentage
Daily	62	27.7%
Weekly	89	39.7%
Monthly	8	3.6%
Rarely	5	2.2%
Whenever	60	26.8%

Regarding the devices FL learners use to access online dictionaries, Table 5 shows that a laptop computer is the primary tool learners used when consulting online dictionaries. The analysis also shows more than half of the mobile device users reported using smartphones such as Android-based smartphones and iPhones.

Table 5

Devices used for online dictionary consultation (226 respondents)

Devices	Number	Percentage
Laptop	211	93.4%
Mobile device	71	31.4%
Desktop	66	29.2%

A total of 211 respondents reported their purposes of using online dictionaries. Table 6 shows that the vast majority of those reported employing online dictionaries when reading and writing rather than when communicating orally and listening.

Table 6

Purposes of using online dictionaries (211 respondents)

Purposes	Number	Percentage
Writing	180	85.3%
Reading	156	73.9%
Speaking	59	28%
Listening	45	21.3%

A total of 161 respondents also specified how they used online dictionaries when communicating through different modalities of the target language. As shown in Table 7, the respondents focused on different aspects of the target language when consulting an online dictionary to assist communication in each modality. When engaged in a reading task, the data from the respondents reveal that FL learners used online dictionaries to seek help at both the word level (73.3%) and the string of words or sentence level (14.9%). At the word level, they used online dictionaries to check the meaning of a word when it was difficult to figure out from the context. Respondents reported that they used online dictionaries to check idiomatic expressions as well as the contextual meanings of phrases as paper dictionaries do not usually provide meanings of phrases. For example, one respondent said, "I use online dictionaries when I come across a phrase I don't know. I'll look it up online since only individual words are frequently listed in the paper dictionary." At the sentence level, respondents reported that they checked the meaning of an entire sentence usually by, as one respondent put it, using "Google translator [*sic*] to check the general meaning of a sentence, then use online dictionaries to check each word's meaning." Four respondents shared that they used online dictionaries frequently, especially when they were reading digitally mediated texts such as PDFs or websites.

Table 7

Use of online dictionaries in four modalities of the target language (161 respondents)*

	Single words (form, meaning)	String of words/sentences (meaning, grammar)	Tones/ pronunciation	No Use
Reading	118 (73.3%)	24 (14.9%)		
Writing	111 (68.9%)	27 (16.8%)		
Speaking	26 (16.1%)		10 (6.2%)	120 (74.5%)
Listening	46 (28.6%)		3 (1.9%)	98 (60.9%)

*Although a total of 161 respondents answered each question, all respondents did not explain how they used online dictionaries to assist communication in each modality.

As for writing, the data show both the purposes and strategies of FL learners' consultation of online dictionaries. Similar to their consultation in reading tasks, respondents reported employing online dictionaries for word- (68.9%) and string of words/sentence-level (16.8%) consultation. At the word level, they used online dictionaries to search for unfamiliar words. They frequently used digital resources such as online translators to find a target language equivalent of a word in English. Respondents also used online dictionaries to check aspects of words with which they were unfamiliar. These aspects include the appropriateness of word use in a certain context, the accurate written form, spelling, stroke order, gender, and accents. The respondents reported using online dictionaries to find synonyms or "more formal words than those used when speaking." At the string of words or sentence level, the respondents reported using online dictionaries for grammatical guidance or to help translate from English to the target language when they didn't know how to express an idea. They particularly emphasized the resourcefulness of wordreference.com when they sought help with contextual meanings and appropriate usage of phrases. For instance, one respondent reported, "the forums on wordreference.com are useful for idiomatic phrases." Unsurprisingly, compared to their consultation for reading purposes, the respondents tended to use online dictionaries to check contextual meanings and sentence-level grammar structures slightly more frequently when completing writing tasks.

When speaking in the target language, the majority of respondents (74.5%) reported not using an online dictionary to facilitate language use because of the immediacy of oral communication. However, the 16.1% who did use online dictionaries used them to check an individual word's conjugation, to confirm the meaning of a word they planned to use, and to find an appropriate equivalent to an English word. Some respondents (6.2%) particularly used online dictionaries to check an individual word's correct tone or pronunciation.

Similarly, 60.9% of the respondents reported not using online dictionaries when listening to a FL. However, when attempting to comprehend radio programs, movies, television shows, online video clips, and listening assignments for class, 28.6% did tend to use online dictionaries to verify the meaning(s), spellings, or written forms of a word or a phrase they heard. A few respondents (1.9%) verified the tones or pronunciations of new words they heard. They usually did this by typing the approximate pronunciation of an unfamiliar word into an online dictionary, either during or after the listening task.

In sum, when conducting reading and writing tasks, the respondents primarily used online dictionaries to seek information about word-level meaning and form. Some respondents also sought help with idiomatic expressions and sentence-level grammatical structures. The majority of the respondents did not consult online dictionaries when completing speaking and listening tasks. When they did, their purpose was to consult the meanings, forms, and pronunciations of words.

Question 3: How do FL learners perceive the role of online dictionaries?

Regarding learners' perceptions, there were three general views reported in the survey. As shown in Table 8, the vast majority (74.9%) of the respondents perceived online dictionaries as very useful and helpful in their FL learning. A few (4.7%) expressed the view that online dictionaries are not very helpful and often harmful tools for FL learning. Some (20.4%) held a neutral attitude, reporting that online dictionaries have advantages and disadvantages for FL learning. It is worth noting that the overwhelming positive attitude toward online dictionaries held true across the popular languages (except Italian) surveyed in this study.

Table 8

Perceptions about Online Dictionaries (194 respondents)

Language	Positive	Negative	Neutral
Arabic	2 (50%)	1 (25%)	1 (25%)
Chinese	15 (83.3%)	0 (0%)	3 (16.7%)
French	55 (72.4%)	1 (1.3%)	20 (26.3%)
German	12 (75%)	1 (6.2%)	3 (18.8%)
Italian	2 (33.3%)	0 (0%)	4 (66.7%)
Japanese	9 (64.3%)	1 (7.1%)	4 (28.6%)
Russian	2 (50%)	1 (25%)	1 (25%)
Spanish	62 (82.7%)	5 (6.7%)	8 (10.6%)
Total	161 (74.9%)*	10 (4.7%)*	44 (20.4%)*

*The numbers differ from the total of those who answered the question because some respondents were learning multiple languages and thus might be counted twice or three times in this table. In addition, there were a few respondents who learn languages other than those listed above.

Regarding the positive qualities of online dictionaries, the respondents reported that online dictionaries are free, fast, convenient, easy to use, and up-to-date compared to paper bilingual dictionaries. In addition, online dictionaries were perceived to meet learners' multiple needs, offering efficient assistance with pronunciation, verb conjugation, slang, cultural connotations, and effective translation beyond the individual word level, including phrases and sentences. One learner of Chinese shared his positive experience with multiple tools and explained how he used different online dictionaries for different purposes:

I tend to use different dictionary sites for different purposes. Google translate is good for copy and pasting Chinese text to translate. Nciku.com is great for searching characters, and looking up words in English to translate to Chinese. They are tools I use often, but [I] am not dependent upon [them].

While this FL student, like other respondents, explicitly expressed not being dependent on online dictionaries, others expressed their dependence. One said, "without WordReference some days, I feel as though I could die." Learners of French and Spanish particularly praised the cultural discussions surrounding vocabulary usage provided in wordreference.com. Other respondents also reported that many online translation websites provide multilingual translation, which is particularly beneficial for multilingual learners and for those students learning multiple languages.

Although the majority of respondents reported positive impressions of online dictionaries, some reported poor quality in some online dictionaries. They characterized the information provided in many online dictionaries as incomplete, unreliable, and lacking in contextual information and grammatical explanations. Several respondents enrolled in first-year language classes reported confusion because of a conflict between the vocabulary in their textbooks and the word(s) provided by an online dictionary. The survey data reveal the existence of different perceptions in the quality of online dictionaries across languages. Specifically, one Arabic learner reported, "there is [sic] no good online dictionaries for Arabic yet." While easy access was usually considered positively, several L2 learners reported that such convenience often encourages over-dependence. One respondent reported that the quick speed at which words can be looked up in online dictionaries makes remembering them less necessary and, consequently, more difficult to learn.

The group of respondents who held neutral perceptions about online dictionaries explained that (1) online dictionaries are good for consultation of single words, but not complex sentences; (2) online dictionaries are good for beginners, but not for advanced-level learners; and (3) the reliability they give to information in online dictionaries varies.

Discussion

The findings reported above show clear resonance with previous studies (e.g., Lan, 2005; Lew, 2011; Loucky, 2010) and confirm the popularity of online dictionary use among postsecondary FL learners in the United States. Complementing the previous literature on online dictionary use for FL learning, the findings in the current study reveal postsecondary FL learners' online dictionary use strategies when conducting various tasks and their perceptions about the usefulness of online dictionaries in FL learning. In this section, the authors will first discuss what the findings imply for FL learning and then offer suggestions for the use of online dictionaries in FL teaching and learning.

As previous studies (e.g., Chun, 2001; Elola et al., 2008; Kaur & Hegelheimer, 2005; Lenders, 2008; Loucky, 2010) have shown, the current study found that online dictionaries provide helpful and convenient assistance for FL learners' access to and learning of lexical meanings and forms in reading, writing, listening, and speaking tasks, as well as word pronunciations in listening and speaking tasks. Multilingual online dictionaries are particularly appealing to learners of multiple FLs. Similar to the findings in the Elola, et al. (2008) study, the respondents in the current study reported that they employed various strategies to search not only single words but also contextual meanings of phrases when engaged in reading and writing tasks.

Complementing the findings in the previous studies, the current study also discovered that FL learners were aware of the strengths and weaknesses of online dictionaries compared to paper dictionaries. To take advantage of online dictionaries' convenience and currency while simultaneously overcoming lack of rigor in certain online dictionaries, they often adopt multiple online dictionaries in conjunction with other digital resources, such as online translators. In particular, wordreference.com was reported as the most frequently consulted online dictionary because of its online forum, where learners/users of one language can share and seek help with appropriate usage of phrases and sentences in specific cultural and social contexts. Google, including Google Search and Google Translate, was reported as the second most popular online tool, due in part to its concordance function and convenience. However, learners usually use Google as a complementary tool to online dictionaries due to Google Translate's lack of grammatical explanation and its perceived word-to-word translation.

The awareness of this perceived deficit indicates FL learners' competence in selecting and strategically using appropriate tools to facilitate their language learning, a great sign of self-regulation (Lantolf & Thorne, 2006). However, it does not necessarily mean that learners, particularly those at a lower proficiency level, are able to differentiate between qualities of a burgeoning number of online dictionaries. FL instructors should help FL learners develop this ability by providing training on how to distinguish reliable online dictionaries from unreliable ones. Learners of popular FLs, such as Spanish and French, can take advantage of a variety of reliable online dictionaries, such as wordreference.com, whereas learners of some less commonly taught languages, such as Arabic, may not have such advantages. Thus, instructors of these less commonly taught languages may need to offer more help to identify, select, and even develop alternative online dictionary resources for language learners.

The popularity of Google Translate and other online translators as additional digital resources in FL learning, as reported by the surveyed respondents, has pedagogical implications as well. Besides providing the basic meanings and written forms of single words in the target language as regular dictionaries do (Lew, 2011; McAlpine & Myles, 2003; Miller, 1999), online translators also allow for convenient translation of a string of words or an entire sentence. As the survey findings show, learners believed the use of online translators expedites their reading and writing processes in their target language while reducing language anxiety. However, in addition to students' overdependence on online translators to read and write entire sentences—particularly among beginning learners still at the object-regulation stage—Google Translate and other online translators fail to provide explicit guidance and very often ignore words' specific contexts.

Therefore, instructors may choose to address such tools in their classrooms and demonstrate effective strategies regarding their use. As researchers (e.g., Chun, 2001; Lenders, 2008; Loucky, 2010) have found, online glossaries help lower-level learners develop vocabulary, especially when conducting reading tasks in the target language. Such lower-level learners can not only be encouraged to use online translators as quick and convenient glossaries for single words and idiomatic expressions, but also be cautioned about dictionaries not supplying multiple and contextual word meanings. In addition, FL educators can encourage learners' critical thinking and gauge their development of awareness and metalinguistic knowledge by guiding in-class or online discussions of the instances in which online translators provide inaccurate, and even humorous, translations. Learning tasks can be created to guide advanced-level learners to use online translators and online dictionaries in concert to facilitate language learning and develop effective digital literacy practices. For example, advanced-level learners can be asked to use online dictionaries to retranslate Google Translate-generated translations, which may help them develop a richer understanding of each word's contextual meaning and usage.

Because online dictionaries are ubiquitous and online homework in reading, writing, listening, and speaking tasks is prevalent, the use of online dictionaries seems to be an irreversible trend in FL teaching and learning. Online dictionaries and other digital resources, such as online translators, have great potential in assisting FL learning inside and outside the classroom. Although FL learners have awareness of the strengths and weaknesses of these tools, FL instructors should develop and facilitate a better understanding of the quality and functions of various online dictionaries in the target language. Instructors can provide the necessary guidance to help students better take advantage and avoid the pitfalls of tools that FL learners are already using.

Limitations

The study is not exempt from limitations. The first limitation of this study is inherent in the survey design. All the data were self-reported from FL learners. Thus, the trustworthiness of the investigation was subject to the quality of the survey respondents' self-reported data. Second, the survey consisted of 17 questions of various formats. It may not have collected all necessary information to understand the issues under investigation. Third, 265 respondents may not be a large enough number to generalize the research findings to all college-level foreign language learners. This limitation may be more prominent, considering the variety of FLs investigated in this study. To mitigate these limitations, future studies may focus on both larger-scale survey results and online dictionary users' log files or recorded screen activities to provide a fuller picture of FL learners' use and perception of online dictionaries.

Conclusion

This paper reports the findings of a web-based survey investigating both which bilingual online dictionaries that FL learners enrolled in 4-year college-level foreign language programs in the United States use and how the FL learners use and perceive the helpfulness of the bilingual online dictionaries. The data were collected from a total of 265 respondents representing learners of 18 FLs and were analyzed both quantitatively and qualitatively.

The findings show that the vast majority of college-level FL learners use bilingual online dictionaries frequently in reading, writing, listening, and speaking tasks inside and outside of classroom. Despite the fact that online dictionaries were explicitly defined at the start of the survey as excluding online translators such as Google Translate, wordreference.com, and Google, including Google Search and Google Translate, are reported as the two most popular online dictionaries. This was the case across all L2 learners, although learners of languages other than French and Spanish reported a preference for other online dictionaries. The survey respondents reported using online dictionaries to check lexical meanings and forms when conducting reading, writing, listening, and speaking tasks. In reading and writing tasks, they also focused on contextual meaning, word order, and grammar of strings of words and sentences. In listening and speaking tasks, they checked tones and pronunciations of single words as well. Learners also reported use of multiple online dictionaries in conjunction, for multiple purposes. The vast majority of FL learners across all languages perceive bilingual online dictionaries as helpful tools for FL learning. Learners of less commonly taught languages raise the issue that there is a scarcity of reliable online dictionaries in the target language, whereas learners of Spanish and French widely praise the helpfulness of wordreference.com. Based on the findings, the researchers provide suggestions for cautious and thoughtful use of online dictionaries and online translators in FL learning.

This study answers the call from dictionary researchers (e.g., Grabe & Stoller, 1997) and CALL researchers (e.g. Chapelle, 2009) for more research on L2 learners' ability to choose and use online dictionaries for communication and language learning. Its contribution is in its systematic investigation of how a relatively large population of United States college-level FL learners self-reported using online dictionaries. It provides a useful list of popular online dictionaries employed by learners of eight popular FLs. Finally, the study shows how the learners use and perceive bilingual online dictionaries. These findings will help researchers and educators in the field of FL education understand students' selection and use of various digital resources inside and outside of the classroom. The pedagogical suggestions discussed here can provide guidance for FL educators when introducing online learning resources to their students.

However, all findings are based on self-reported survey data. Future studies can be conducted to investigate FL learners' use of various digital resources, including online dictionaries, through observing their completion of a particular task. How FL learners at different proficiency levels use and perceive online dictionaries would also be an interesting research topic. As shown in the study, students' interest in and use of mobile access to online dictionaries are emergent. Which mobile dictionaries are used in FL learning and how these dictionaries are used merits further investigation as well.

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Appendix A: Survey on FLL's Perception and Usage of Online Dictionaries

Dear Student,

Thank you very much for answering this survey. Your careful answers to each question in this survey will help us understand whether and how postsecondary-level foreign language learners are using online dictionary(ies) to assist their foreign language learning. Your answers will remain anonymous.

Definition of online dictionary:

Any dictionary that is available via the Internet, downloadable application or handheld device to assist you in understanding the meaning, pronunciation, and/or usage of any vocabulary or phrases in a foreign language you are learning.

Please note that online dictionaries do not include online translators such as Google Translator or Babel Fish.

1. This semester, Fall 2010, are you enrolled in a foreign language course at a college or university in the United States?

- Yes
- No

2. What foreign language(s) are you studying?

3. In which level course are you enrolled? (Please select all that are appropriate to your situation)

- First-year
- Second-year
- Third-year content-based course (i.e. literature, culture, film)
- Third-year language-based course (i.e. conversation, grammar, composition)
- Fourth-year content-based course (i.e. literature, culture, film)
- Fourth-year language-based course (i.e. conversation, grammar, composition)

Other (please specify)

4. What is (are) your native language(s)?

5. Do you own a bilingual paper dictionary for English and the language that you are studying?

Yes

No

6. If yes, how often do you use your bilingual paper dictionary? And for what purposes do you consult your paper dictionary?

7. Do you use electronic dictionary (ies) for your foreign language learning?

Yes

No

8. What online dictionary (ies) do you use to assist your foreign language learning?

9. How often do you use electronic dictionary(ies)?

Daily

Weekly

Monthly

Very rarely

It depends on when I need help

Other (please specify)

10. Through what type of device do you access an electronic dictionary(ies)?

- a desktop computer
- a laptop computer
- iPhone
- Blackberry
- Droid
- iPad
- iTouch
- Other mobile device

11. For what purpose(s) do you use an electronic dictionary?

- Reading
- Writing
- Speaking
- Listening

12. Which dimensions of the language do you use an online dictionary(ies) to check?

	Individual vocabulary word	String of words	Complete sentence
Meaning in English	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Meaning in the language that you are learning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spelling/written form	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pronunciation and/or tone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Part of speech	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Individual vocabulary word	String of words	Complete sentence
Word order (combination)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Grammar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Other (please specify)

13. When reading in the language you are learning, when and how do you use an online dictionary(ies)?

14. While writing in the language that you are learning, when and how do you use an online dictionary(ies)?

15. While speaking in the language you are learning, when and how do you use an online dictionary(ies)?

16. While listening to the language you are learning, when and how do you use an online dictionary(ies)?

17. How do you perceive the role of online bilingual dictionary(ies) in your foreign language learning?

Thank you for your participation!



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