
Pocket Electronic Dictionaries for Second Language Learning: Help or Hindrance?

Gloria M. Tang

This article reports on a study that addresses the concerns of ESL teachers about their students' use of pocket bilingual electronic dictionaries (EDs). The purpose is to communicate to content and language teachers: (a) the features of the ED, (b) the uses secondary level ESL students make of the pocket ED as a tool for learning English, (c) the effectiveness of the ED in helping ESL students' comprehension and production of English, (d) students' perception of the usefulness of the ED, and (e) the strengths and weaknesses of the ED as perceived by ESL teachers. The findings indicate that not only do a large number of Chinese ESL students own EDs, but they also make consistent use of them during reading comprehension and writing classes. Examples are given of the students' successful and unsuccessful attempts using the ED, and recommendations are made for ESL teachers to teach dictionary skills.

Introduction

In the last seven years, pocket bilingual electronic dictionaries (EDs) have become popular with English as a second language (ESL) students, especially Asian students, in Vancouver, British Columbia. Many ESL teachers view the use of them with concern. Some are against it because they do not advocate ESL students using their first language (L1) in the classroom. Others are concerned because they have no idea of what the students are doing with their EDs. A number of teachers have from time to time sought my advice on whether the ED should be banned in the classroom. This article reports on a study designed to address the concerns of ESL teachers about ESL students' use of the pocket ED.

More specifically, the following concerns are addressed: (a) the features of the EDs, (b) the uses the secondary level Chinese-speaking students who have recently joined an English-speaking school system make of the ED as a tool for learning English, (c) the effectiveness of the ED in helping comprehension and production of English, (d) the students' perceptions of the usefulness of the ED, and (e) the strengths and weaknesses of the ED as perceived by the ESL teachers.

The ESL enrollment in Vancouver schools has increased so dramatically in the last decade that English has become the minority language (Rinehart, 1996) in many school districts. In the Vancouver school district, the ESL enrollment in 1994-1995 is almost 51% of the total student population (29,000

out of 57,000); and the ESL enrollment in Richmond, which has grown by 2,800%, is verging on 50% (10,000 out of 24,000). In many schools in Vancouver most of the ESL students are Chinese-speaking students from China, Hong Kong, or Taiwan. These students have recently arrived in Vancouver either as immigrants or as international students. They are aware of their low English proficiency and feel considerable pressure to improve their English to access mainstream classes and credit courses and, eventually, university education. As a result, these students, especially those at the secondary level, struggle in various ways to improve their academic English, which to most of them is synonymous with acquiring as large a vocabulary as possible. One of the strategies they employ is avidly to look up the meaning of all vocabulary items they come across using bilingual EDs. The question arises, does the ED help the students acquire academic English proficiency? Is the ED a help or a hindrance?

With the exception of a study of the features of EDs published by the Hong Kong Consumer Council (1995), an article on postsecondary students' use of pocket EDs by Taylor and Chan (1994), and a few studies on bilingual dictionaries conducted in Hong Kong (Chi, 1996; Taylor, 1996), there are few studies on the use of EDs. Moreover, I have not been able to locate empirical studies on the topic. Taylor and Chan (1994) examined the use and usefulness of pocket EDs from the point of view of postsecondary students and a small number of teachers in Hong Kong. All the students who used EDs indicated that they used it "to find or check the meaning of English words" (p. 601). They conclude that

There is clearly considerable potential for pocket EDs because of their ease of use and range of features, including the availability of sound ... [although they] generally lack several of the ten features expected in dictionaries for learners as listed by Hartmann (1992, p. 153). (p. 601)

In his survey of a limited number of school teachers and university instructors on students' use of dictionaries in Hong Kong, Taylor (1996) reports that about 20% of the secondary school teachers reported that some of their students used EDs, while 19 out of 26 instructors at a university reported that undergraduate students used EDs.

Although few studies explicitly explore how Chinese students actually use EDs or book dictionaries, some studies do shed light on the topic. Gu's (1994) case study of vocabulary learning of good and poor Chinese EFL learners is a case in point. Gu employed think-aloud techniques to discover learner thinking processes or patterns, for example, when they looked up unfamiliar words in dictionaries and when they took down notes. He found that good readers were more discriminating in their selection of words to look up, and that good readers guessed the meaning from context before deciding whether to look up the word. Poor readers, on the other hand,

looked up words immediately, and they looked up all unfamiliar words they came across. However, the students Gu researched used book dictionaries and not EDs. I have not been able to locate any research literature on how ESL students, specifically Chinese students, use the pocket ED in terms of the words they look up, when they look them up, how they look them up, and what they look for. This study proposes to fill this gap.

Method

The study was conducted in three secondary schools in Vancouver, involving a total of 254 Chinese students and 10 teachers (see Table 1). In addition I interviewed 10 other ESL teachers about their perception of their ESL students using the ED. The research sites included two public schools and one independent school, which were chosen because of accessibility. Although they were not randomly selected, the two public schools reflect the characteristics of the student population in many British Columbia schools. Both have a high ESL population and the majority of the ESL students are from Asia. The independent school is an English language school that provides ESL and transitional classes for recent immigrants and overseas students who, for various reasons, such as age or nonimmigrant status, are not admitted into the public school system. The student enrollment in this school is made up exclusively of Asian students from Hong Kong, Taiwan, China, Vietnam, and Korea.

The Participants

Although all the ESL students in the two public schools and all the students in two classes of the independent school were surveyed, this article reports on the data of the Chinese students only. The reasons are: (a) the majority of the ESL students surveyed were Chinese, and (b) the researcher can understand and analyze the language without a translator or interpreter. Of the 305 ESL students surveyed, 254 (83%) were Chinese, speaking either Mandarin or Cantonese. The ages of the students in the public schools ranged from 13 to 18, but a few of the students in the independent school were 19. Their length of residence in Canada was between one month and two years.

Data Collection

Data collection began by administering a questionnaire to all the participants. The questionnaire sought information on whether they owned or used EDs; the brand, make, and cost of their EDs; and how often and for what purposes they used the ED. Other methods involved observing two groups of students in the independent school and one group in one of the public schools in their ESL classrooms. The students in the independent school were observed three days a week for three months. The students' use of the ED during listening, reading, and writing was recorded; and their

Table 1
Data Collection Methodology

	No. of Students	Questionnaire	Observed	Inter- viewed	Teachers questionnaire	Ss Notes
School A (Public)	146	146			5	
School B (Public)	80	80	20 Ss 4 hours			
School C (Independent)	28	28	28 Ss 3days/wk 3 mths	28	5	28

assignments, the handouts the teacher distributed, and their vocabulary notebooks were examined. They were also interviewed about their use of the ED and their perception of its usefulness. In addition, the teachers whose students had been surveyed, along with 10 teachers from other schools not in the study, were invited to complete a questionnaire. Data collection methodology is summarized in Table 1.

Results

I report the results under five headings: the features of the EDs; the uses (how and for what purpose) the secondary level Chinese-speaking ESL students made of the ED; the effectiveness of the ED in helping ESL students' comprehension and production of English as perceived by the researcher; the students' perception of the usefulness of the ED; and the strengths and weaknesses of the ED as perceived by ESL teachers.

The Features of the ED

The EDs investigated here are pocket-size, usually consisting of a translator or bilingual dictionary, calculator, and diary/organizer. They are mostly made in Hong Kong or Taiwan. During the time of the research, the price ranged from about \$400 to over \$1,000 Canadian, depending on the features or functions of the dictionary. These machines are gradually becoming more affordable and user-friendly and as a result more popular.

Instead of describing all the features of the most up-to-date EDs, I list the features found in the EDs used by the students I observed (see Table 2). As Chinese is written in characters, different input methods are provided for students to access information in Chinese. Among the methods are radical stroke and total stroke, both of which involve counting the number of strokes of a Chinese character; Cantonese romanization (phonetic symbols); Man-

Table 2
Features of Electronic Dictionaries Used by Students Observed

<i>Categories</i>	<i>Description</i>
English-Chinese dictionary	<ol style="list-style-type: none"> 1. Head word 2. Phonetic script (two systems: DJ & KK) 3. Parts of speech (abbreviations differ, for example, a/adj) 4. Meaning/ senses in Chinese Buttons ⇒ grammar, example sentence, synonyms, antonyms, collocation
Chinese-English dictionary	Different access methods, for example, Mandarin pinyin and zhuyin, Cantonese Pinyin, pen
Slang dictionary	Idiomatic expressions
English roots	<ol style="list-style-type: none"> 1. Male English names 2. Female English names 3. English prefixes 4. English suffixes
Phonetic drill	<ol style="list-style-type: none"> 1. Phonetic symbols 2. Vowels 3. Consonants 4. Spelling drills 5. Phonetic drills (filling in blanks)
Practical noun lists	Nouns classified by topic, for example, apparel, dining, home
Travel dialogue	Subtopics
Listening and learning	<ol style="list-style-type: none"> 1. Listening and learning 2. English Chinese review (User-made list) 3. Chinese English review 4. Slang review 5. Dialogue review (2-5 Space for entering personal word lists)
Sentence making	Seven levels of jumbled sentences with answers, Chinese translation, sound, and help
Explanation of use	<ol style="list-style-type: none"> 1. How to use pen in Chinese 2. Explanation of keys in Chinese 3. Pinyin cross-reference = pronunciation code 4. Abbreviation of dictionary in Chinese 5. Word sign of dictionary, e.g., n = noun 6. Opinion area
Calculator	
Diary/Notebook/Organizer	
Games	

darin pinyin (phonetic symbols); Mandarin zhuyin (phonetic symbols); and pen input (input by writing the Chinese character on the screen).

In the English-Chinese (E-C) dictionary, for example, the screen shows the English head word, phonetic scripts of the word, the part(s) of speech of

the word, and the Chinese translation. In most of the EDs, two phonetic scripts are included, representing both British and American pronunciations. In addition, the user can access other screens directly by clicking on one of the buttons at the bottom of the screen. Typically, Button 1 accesses the grammar or part of speech of the word; for example, if the head word is a verb, it shows the past tense form, the past participle, and the present continuous form of the verb. Button 2 gives example sentences; Button 3 synonyms; Button 4 antonyms; and Button 5 collocations. A feature of the ED that does not exist in book dictionaries is sound. Learners can check the pronunciation of a word or phrase by pressing the voice button. However, the synthetic sound is not always clear, and the pronunciation is artificial.

As EDs are meant for learners, it is appropriate to evaluate them against Hartmann's (1992) criteria of a good learners' dictionary. Most of the models exhibit few of these criteria that are listed as follows:

1. the word-list is selected according to criteria of frequency and usefulness;
2. the definitions are geared to the more limited vocabulary of the foreign learner;
3. the different senses of the headword are clearly discriminated;
4. collocational detail is provided, usually by example sentences;
5. grammatical coding is detailed and explicit;
6. phonetic transcription is international;
7. stylistic information is given, typically by usage labels;
8. textual transparency is considered desirable;
9. historical-etymological information is (usually) avoided;
10. cultural information is (occasionally) provided, for example, by pictures. (p. 153)

It is true that in most EDs the definitions are geared to the more limited vocabulary of the foreign learner, that international phonetic transcription is used, and that complicated historical-etymological information is avoided. However, the word lists in some EDs are confusing and complicated. Often they consist of different lists, one for common use, one for secondary level students, and one for TOEFL; and the words found on one list are not consistently present in other lists. Besides, the word list is short and limited. Collocation is not detailed; example sentences are only included sometimes; and grammatical coding is broad. What causes much confusion is the fact that the different senses of a word are not listed according to meaning. They are classified according to parts of speech, and often a literal meaning is followed by an unrelated figurative meaning.

However, with all these negative characteristics, the ED has its usefulness and has become important to many ESL students as the following findings show. Also, there are differences among the different brands. Some have a

more comprehensive word list; some have more detailed grammatical codes, and some discriminate the different senses of a word more clearly than others. Another difference is that some are designed for Mandarin speakers whereas others are designed for Cantonese speakers. A Cantonese speaker may find a Mandarin dictionary difficult to read. Further research to discover the most appropriate brand of ED for specific groups is recommended.

Uses Secondary-Level Chinese-Speaking Students Made of the ED

The survey showed that 87% of the Chinese students owned EDs. Many of those who did not own one used a friend's from time to time. One student pointed out that it was "the student's best friend." Another remarked that he felt lost when his ED was down. Most of the students had used the ED for one to three years; they had started using one in their home country. A few had owned one for over five years, and a small number had used one for only a few months since coming to Canada. Those who had used an ED for over a year were comfortable with it and made use of many of its features. It is interesting to note that none of them played the computer games included in the ED, mainly because the games were not interesting. The survey, observations, interviews, and documents all indicate that the students made use of different functions of the ED and that their main concern was to look up the meaning of vocabulary.

Finding 1: The students' main concern was looking up the the Chinese translation of English words.

In response to the survey question of what they used the ED for, all the students said that they used it to look up the meaning of vocabulary, supporting the finding of Taylor and Chan's (1994) survey of postsecondary Hong Kong students' use of the ED. In the survey, all the students indicated they used the ED to look up the meaning or definition of words. This was confirmed by classroom observations that showed that ESL students used the ED most frequently during reading comprehension and listening comprehension. The function most frequently used was the E-C dictionary. When the teacher used a word they did not understand, they used the ED, and when the teacher wrote an unfamiliar word on the chalkboard or asked the students the meaning of a word, they used the ED. During their daily uninterrupted silent reading of storybooks and doing comprehension exercises, about 60% of them invariably used the ED. In other words, the ESL students used the ED for vocabulary learning. For them vocabulary learning was synonymous with learning the language or attaining literacy. They believed that "vocabulary learning is at the heart of mastering a foreign language" (Rubin & Thompson, 1994, p. 79), and that "the vocabulary size of a learner is highly predictive of his entire language ability" (Gu, 1994, p. 376).

For most of the students, vocabulary learning meant knowing the meaning or the Chinese translation of the word. For a few, vocabulary learning

was learning the meaning as well as the pronunciation and spelling of the word. When the students were required to do a language task that involved using vocabulary in sentences, they looked up the sample sentences screen as well. However, the teacher's handouts, for example, comprehension passages, and the students' vocabulary notebooks showed that the students' most immediate concern was a translated meaning, that is, the Chinese equivalent, rather than sensemaking of the passage. For example, the comprehension passages and work sheets were usually full of the Chinese equivalent of the vocabulary squeezed between lines and in margins. Occasionally, it was accompanied by phonetic scripts. Some of the students kept a vocabulary notebook in which they entered and stored all unfamiliar words they came across for later retrieval. The entries were not alphabetized or categorized in any way. Table 3 shows typical vocabulary notebook entries.

Finding 2: Students looked up the grammar entry of the ED depended on their knowledge of grammatical terms.

In the survey, about 50% of the students claimed they looked up the grammar of words. This was confirmed by the classroom observation. Again, about 50% of the students observed referred to the grammar entry when they were trying to choose the right equivalent from the many meanings or senses of a word. Whether they checked the grammar entry depended on, and reflected, their understanding of grammar and grammatical terms.

I found that all the older students (age 16-19) were aware of the part-of-speech entry in the ED. Younger students who joined the English-speaking education system at grade 8 were not aware of it nor did they understand the meaning of the abbreviations indicating parts of speech. The older students, especially those from Taiwan, understood the abbreviations, meanings, and

Table 3
Examples of Vocabulary Notebook Entry

<i>Head word</i>	<i>Phonetic scripts</i>	<i>Chinese equivalent</i>
psychologist	/saikalədzist/	心理學家
assumed	/əsjumd/	想象的

<i>Head word</i>	<i>Part of speech</i>	<i>Phonetic scripts</i>	<i>Chinese equivalent</i>
psychologist	n.	/saikalədzist/	心理學家

functions of nouns, adjectives, adverbs, and verbs, but only a few (20%) understood the symbols vi (verb intransitive) and vt (verb transitive). A few of the students knew the definitions of the different parts of speech but did not know how to use those definitions in selecting vocabulary items correctly. The Hong Kong students' knowledge of grammar varied from student to student; some did not seem to be familiar with the parts of speech at all. The following are some of their interview responses:

Ang¹: *Never learned grammar in Hong Kong. Therefore, I'm not sure what adj and v mean.*

An An: *Learned in Hong Kong but only simple ones. Maybe n and a-d-j.*

Kary, Tony: *Never been taught before.*

Finding 3: The students used different ways to learn the pronunciation of a word.

Both surveys and interview results showed that about 85% of the students used the ED to check pronunciation. Some read and wrote down the phonetic transcription; others used the sound feature as well. Many of the older students from Taiwan had learned phonetics before coming to Canada. Whenever these students looked up the meaning of a word, they copied the phonetic transcriptions into their vocabulary books and sometimes on handouts. However, they seldom tried to read it to themselves. When asked to read it, only about 10% of the students read the transcriptions accurately.

From time to time the teacher's explanation, instruction, or questioning was interrupted by indistinct robotic-like sounds from different corners of the room when students needed to answer the teacher's "What's the meaning of ...?" questions.

As for pronunciation, even after listening to the ED's pronunciation, the students responded by spelling out the word they could not pronounce. Most indicated that they did make use of the sound feature to check or find out the pronunciation of words. However, they could not always imitate the sound. In some EDs it is possible to change the speed of the sound. One of the students used this feature to slow down the pronunciation of the word before imitating the slightly distorted (too deliberate) pronunciation. It was only after he had slowed down the speed that he could hear clearly and imitate the pronunciation. A few used the ED to check the stress or intonation of the word.

Finding 4: The students used various strategies for meaning-making.

As mentioned, students used the E-C dictionary most frequently but they also used the C-E dictionary. The older students who were all highly proficient in their L1 found the Chinese definitions in the ED easy to understand. Only occasionally did they misinterpret the positive or negative connotation of the word. What posed a problem for most (70%) was the multiple meanings or senses of the vocabulary; they found it hard to decide on the most

appropriate one. Interviews showed that the students had different ways of dealing with the problem. Some of the strategies they used follow.

Guessing from Context

Using the E-C dictionary to look up English words they did not understand, about 70% of the students read the various meanings, looked at the context, and guessed, for example,

Suki: *See the story. Know what it's about. Look at meaning and decide.*

Kong: *To choose. Look at sentence and compare sentence with meaning.*

Sali: *Because the same word has many meanings so I read the sentence again and guess the meaning.*

Johnson: *Look at paragraph. Look at meaning. Look at paragraph again.*

Checking Parts of Speech

The students who were familiar with grammar checked the part of speech of the word and its meaning to decide on the choice, for example, appropriate (v) or appropriate (n). Adan, who learned grammar in Taiwan, claimed,

See if it's a-d-j or n or v and make a choice.

Charles: *Look at sentence. See if it's v or n or adj.*

Back Translation

During writing classes, the students often used back translation when they looked up words from Chinese to English and found multiple meanings or senses. They looked up each of the definitions for the Chinese meaning again in order to decide on the most appropriate. They also found that this round-about way was time-consuming.

A Combination of Strategies

Approximately 40% of the students indicated they used a combination of strategies. Charlie summarized his strategies as follows:

Charlie: *Not sure which one is the definition. Highlight each definition and press key and check all definitions in ED. Sometimes guess by looking at grammar, v or n or adj.*

Thus, for at least 40% of the students, looking up vocabulary in the dictionary was a problem-solving exercise. It involved guessing. It also involved interaction with the text in front of them. In other words, they were looking for contextual clues as best they could. Figure 1 is a diagrammatic representation of the meaning-making process of one of the students. The student interacted with the text and made attempts to look for contextual clues in order to guess the meaning. Of course, there were others who looked up the word, copied one or all of the meanings, and forgot about it. Figure 2 gives an example of such a learner.

Figure 3 summarizes the meaning making processes of a number of students. None used all the strategies in the diagram, but they used a com-

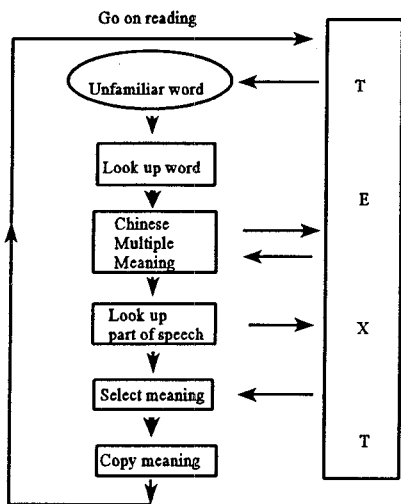


Figure 1. Flowchart of Student A's use of the ED.

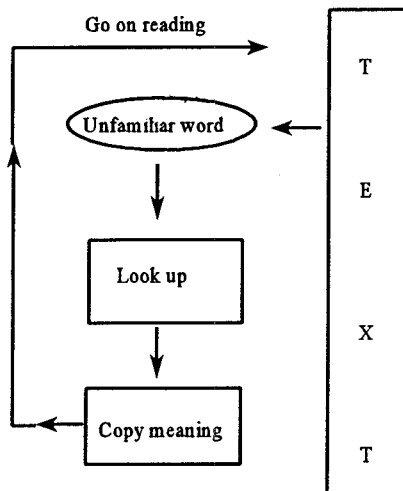


Figure 2. Flowchart of Student B's use of the ED.

bination of some. The attempts were sometimes successful and sometimes unsuccessful.

The Effectiveness of the ED in Helping Students in the Comprehension and Production of English

Finding Five: Successful use of the ED was related to the ESL students' L1 proficiency as well as their knowledge of English grammar.

One factor that contributed to successful use of the ED was the students' Chinese proficiency. On the whole, the older students who had a longer history of schooling in their country of origin were more comfortable and more successful using the ED. A few younger girls at the grade 8 level were less successful. In the first place, they had no dictionary skills. Then they had difficulty understanding the translation, that is, Chinese characters, even when they had found the translation of the English word.

With the older students who were proficient in their L1, I encountered many successful instances of using both the E-C dictionary and the C-E dictionary. During uninterrupted silent reading and reading comprehension, the students were able to guess the meaning of a large percentage of the difficult vocabulary with the help of the ED. During in-class writing the students were able to look up and find the English words they wanted. Table 4 shows some of the successful uses of the ED.

Another factor that contributed to the success of the translation is the students' knowledge of grammar and their readiness to guess from contextual clues. For example, Adan encountered the word *appropriate*. He had no

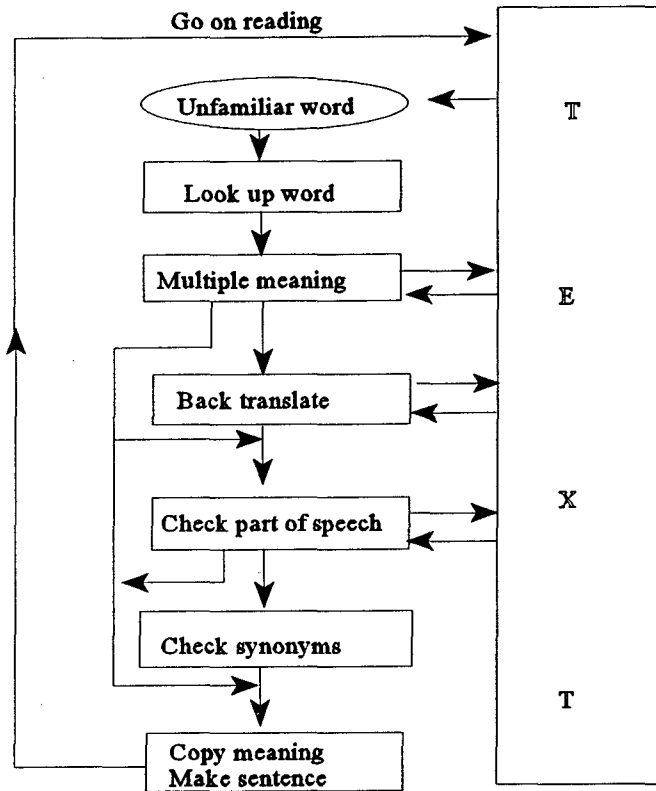


Figure 3. Diagrammatic summary of the meaning-making process of at least 50% of the ESL students using the ED.

idea what it meant. He looked it up and found two meanings on the screen. As a verb it means 據為己有 (invade and occupy; seize); as an adjective, it means 適合

(suitable). Adan looked from the text to the dictionary for a long time. He referred to the context, looked at the part of speech, saw that the second one was an adjective, and made the right choice.

However, I also detected many unsuccessful attempts, although not as numerous as successful attempts.

Finding 6: Unsuccessful use of the ED can be related to the quality of the ED, the intranslatability between two languages, and/or of the students' dictionary skills.

The following are some examples of students' unsuccessful lookups.

Table 4
Examples of Students' Successful Attempts Translating C-E

Examples taken from students' written assignments

根據	<i>According</i> to the teacher's word, this is correct.
分析	I can <i>analyze</i> the situation.
法規	Read the <i>laws and regulations</i> of the classroom.
假裝	He <i>pretended</i> he is policeman.

Slang and Idiomatic Expressions

The students could seldom find the meaning of idiomatic expressions. An example is the looking up of "Sure. Sounds like a good idea!" Congo and Charles looked up "sounds," found four Chinese meanings

n 聲音；可聽範圍；海峽；印象

translations of which are *n* *noise; area within hearing; inlet; impression*. They went back to the sentence; looked at the Chinese definitions again, and gave up. They then looked up *idea* and found six options to choose from, none of which helped them in deciphering the meaning of the expression. Congo tried to translate each word and came up with *Sounds* (subject) *love* (verb) *a good thought*. Paul looked up *sure* and found four adjectives and four adverbs, but the translations did not seem to be of much help.

This is in part because few students were aware of the existence of a slang (idioms) dictionary. In the slang dictionary I found *Sounds great*, which might have helped the student comprehend the meaning of *Sounds like a good idea!*

Multiple Meanings/Senses

Another problem arose as a result of the nature of the English and Chinese languages. An English word may have several Chinese equivalents and a Chinese word may have a number of different English equivalents. The students found it difficult to pick the right definition. Often they made the wrong choice as the following shows.

Johnson wanted to make a funny sentence. So he looked up in the Chinese-English dictionary for the English translation of the word 搶劫. He saw three options: 1 *rob* 2 *loot* 3 *plunder*. He chose 2, back translated, and made a sentence, *Did you loot the bank?*

I asked: *Why did you choose 2 and not 1 or 3?*

Johnson: *I find Chinese meaning of loot in dictionary. (Showed screen)*
 I see vt. Know it is a verb.

Another unsuccessful attempt of looking up a word in the C-E dictionary occurred in a prepared oral presentation by individual students. Each student had to prepare a three-minute speech on a risk taker. Charles chose a Chinese film actor, Jacky Chan. He wanted to say that Jacky Chan never needed a stand-in when shooting a film no matter how dangerous the stunt was. He knew the Chinese term for stand-in **替身,**

looked it up in the C-E dictionary, and found: 1 a *substitute* 2 a *stand-in* 3 a *scapegoat*. He chose *scapegoat* for his sentence, "He never needs a scapegoat," which did not communicate what he wanted to say.

Whether or not the attempt was successful, I feel that for the students, looking up Chinese words in the ED, mainly during writing lessons, was a problem-solving activity. It was not successful because there did not seem to be adequate contextualization for the student to choose the right term, unlike the instances when they were looking up English words and had the text to refer to. There were example sentences, but those did not seem to help.

Limited Entry/Meaning in the ED

Some lookups were unsuccessful because of the limited number of entries in the EDs. There were several instances when the students failed to find the correct meaning of the word simply because the word did not exist in that ED, for example, the meaning of *lunar* as in lunar calendar could not be found; the meaning of *dumpling* as in a specialty food for the Dragon Boat festival was not listed. Other words or expressions that the students could not find in their EDs include (1) *involved* in "became involved in the problems of the country" and *committed* in "to have someone committed."

Derivatives and Compound Words

There was also indication that the students could not find certain words because they did not know where to look when the words did not appear as head words.

However, with all these unsuccessful attempts, the students liked the ED and were aware only of the advantages of the ED.

Students' Perceptions of the Usefulness of the ED

Finding 8: The advantages of the ED as perceived by the students were portability, speed, range of features, and the availability of sound.

Chinese students, especially recently arrived international students and immigrants, relied on the ED and were aware only of the advantages of the ED. The following are some of the students' perceptions of the advantages of the machine:

- Brown and Chuck: *The first reason is fast. ED is easy to find words. Another reason is it has lots of functions. We can find Chinese-English dictionary, English-Chinese dictionary, memory and games. Besides, we can find idioms.*
- Moncton, Alison, Irene: *We can find the words so fast. Secondly we can know how to use the correct words. Also, we can follow the dictionaries to read the words.*
- PoPo, Alan: *It has pronunciation and help students how to read the words. It is very fast and easy to change C-E and E-C.*
- Andrew, Earl: *It is very convenient. It's not only faster than using normal dictionary but also easy to bring along, because it's not weighty.*
- Susie, Tony: *It is easy to understand the meaning. It does not waste time. We can know the pronunciation. We also can know the synonym and antonym at the same time.*
- Johnny, Kong: *Looking for the own language of a word's meaning is easier to understand than a dictionary which is English to English*

To sum up, the advantages of the ED as perceived by the students include portability, speed, availability of sound, and explanation in their own language. These advantages related by the students, incidentally, are similar to the teachers' perception of the strengths of the ED.

The Strengths and Weaknesses of the ED as Perceived by ESL Teachers

Ten ESL teachers responded to four open-ended questions about their perception of the usefulness and disadvantages of allowing students to use the ED in class. In addition, 10 other teachers expressed their views orally. Their responses are summarized in Tables 5 and 6. As the percentage following each category shows, some of the categories reflect the suggestions of a small minority of teachers whereas others reflect the views of all the teachers who responded.

Finding 9. The advantages of the ED as perceived by ESL teachers coincided with the advantages as perceived by students (Table 5).

The greatest advantage of the ED, according to the teachers, is the confidence it gives to the ESL students who own one. Some find it useful as an additional resource, not the only one, however, especially in content classes. One teacher finds the practical noun lists grouped according to topic a useful database for her students. On the whole, the teachers do not object to recently arrived students using an ED, particularly in multilevel classes where the students might be more likely to be engaged in individualized learning. However, the objections they raise appear to outweigh the advantages.

Table 5
The Strengths of the ED as Perceived by ESL Teachers

<i>Why</i>	<i>What/How</i>	<i>Who</i>
Speed 20%)	Vocabulary (40%)	Beginners especially (40%)
Quick reference (40%)	a. Building b. Retrieval	Students in multilevel class (40%)
Confidence 20%)	1. Spelling 2. Pronunciation	
Content learning (20%)	3. Thesaurus 4. Grammar	
	As an additional resource (50%)	
	Word lists grouped according to topic (10%)	

Finding 10. The teachers had a range of concerns about students' use of the ED (Table 6).

The negative perceptions of the ESL teachers can be divided into social and academic categories (Table 6). The teachers believe that the ED encourages antisocial behaviors in students because they interact with the machine rather than with other students. Besides, if the students overrely on the machine, they may be unwilling to take risks in class. Moreover, the ED distracts the whole class when the students pass their machines around, when they play games, and when they do not listen to the teacher. Academically, the teachers are concerned about the quality of the ED, for example, incomplete entry, incorrect entry, and artificial pronunciation. Many of the teachers feel that if they allow the students to use the ED, they are not encouraging them to learn through text and that they are not providing for the students to move away from word level to sentence level and discourse level. Nor are they encouraging them to make the leap from translating to guessing and predicting. An ESL teacher voiced her concern: "Overt use of translation might considerably slow down the students' L2 development and impact upon their ultimate level of English proficiency."

Another ESL teacher maintained that unless ESL students made the leap from reliance on translation to guessing and making predictions using English, they were unlikely to make much progress in their English proficiency. Some teachers, prompted by their intuition that bilingual EDs are of little or no value, advocated banning the use of the ED in their classes.

Table 6
ESL Teachers' Concerns about Students' Use of the ED

<i>Student</i>	<i>Social</i> <i>Class</i>	<i>Dictionary quality</i>	<i>Academic</i> <i>Learning process</i> <i>word-by-word translation</i>
	Distracting to class:		
1. Antisocial (10%)	1. Play games (20%)	1. Incomplete entry 10%	1. Odd usage—unidiomatic (80%)
2. Overreliance on machine—not willing to take risks (60%)	2. Pass Ed around (10%)	2. Incorrect entry (20%)	2. Not encouraging students to learn through context (100%)
3. Status symbol (5%)	3. Don't listen to teacher (10%)	3. Artificial pronunciation (60%)	No provision made for students to move away from word level to sentence level to discourse level; or to make the leap from translating to guessing and prediction
4. Expensive: may lead to theft; needs handling with care (5%)			

Conclusion

Having reported on the answers to the questions this research set out to investigate, the question remains: Is use of the ED by ESL students to be discouraged?

The answer is yes and no. Yes, it is to be discouraged if the students are young and if their Chinese vocabulary is limited. It is to be discouraged if students look up all unfamiliar words indiscriminately, a characteristic of a poor ESL learner (Gu, 1994). It is also to be discouraged if the students make glossaries into laundry lists, isolating words from context, and disregarding any contextual clues—another characteristic of a poor ESL learner.

On the other hand, just as book dictionary use is a valid activity for ESL students (Summers, 1988), so is the use of the ED. ESL students need help in their search for meaning. The ED is often the most readily accessible help; for example, before students have acquired other learning strategies, such as making guesses about new words, or before they have acquired the language proficiency to ask the teacher for clarification and explanation. Moreover, the learning strategy with which they are all familiar, that is, asking help from neighbors, quite often proves fruitless. The ED is certainly not the only or the best strategy for helping learners in the comprehension and production of English, but it definitely is one of the more potent strategies, especially for ESL students with a good background knowledge of their L1. It can help secondary-level students bridge the gap between their prior knowledge and

new knowledge if they know how to use the ED. Moreover, using the ED is a reality in ESL classrooms that will not easily go away.

I share many of the ESL teachers' concerns about their students' use of the ED. However, I believe that most of these concerns can be overcome through teaching and research. For example, if the teacher is concerned about the quality of some of the EDs, he or she can research with the students to discover more about the different brands and to choose the most suitable one for his or her students. Or if the categorization of the words in the ED into different lists, for example, common use, secondary, and TOEFL, makes the lookup process complicated, the teacher could direct the students' attention to the categories and the bases of these classifications. Even if the entries are not comprehensive enough, the ED can serve a bridging purpose. In reading comprehension, for example, ESL students are often confronted with words they need to clarify before they can continue with the text. The ED is a fast and effective means of clarification.

Because ESL students often work on an individual word basis, expecting a one-to-one correlation between Chinese and English, odd uses often result. The teacher can offset these misconceptions by pointing out collocations, contexts, and grammatical possibilities of the word.

Another objection voiced by the ESL teachers is that the ED does not encourage students to learn by using contextual clues. I find that looking up a word with the ED is a problem-solving exercise for some students. The students I observed did in fact engage in linguistic processing of the word (Summers, 1988). They did interact with the text and look for contextual clues as best they could. Only they needed the ED, or any bilingual dictionary, to make that necessary link before they could do the linguistic processing and the guessing. Maybe it was the ED or other bilingual dictionary that forced the students back to the text. Those students who look up all words indiscriminately without engaging in linguistic processing need to be directed in using the ED optimally.

In short, my suggestions to ESL teachers who are concerned about their students using the ED include (a) teaching dictionary skills, and (b) conducting research collaboratively with ESL students to find out more about the ED's features and possibilities. It is true that the students all assured me that the ED was easy to use, for example, that they looked at the manual or played with it and soon mastered it. However, what they lacked were dictionary skills, with both book dictionaries and EDs. They need to learn about:

1. the base forms of the verb;
2. the different functions of the ED and how they are useful;
3. parts of speech and what the abbreviations, such as a., vi., n., etc., indicate;
4. the appropriate explanation to choose when there are multiple meanings and senses;

5. where to look up derivatives, for example, violinist;
6. where to look up compound words, for example, desktop computer; and
7. how to use the slang (idioms) dictionary.

A second suggestion is to conduct research on the use of the ED and to do it with the help of the ESL students. By so doing the teacher can begin to become less suspicious of the ED and what the students are doing when they are using it. Also, in this way the teacher can overcome the disadvantages of the ED. Two areas that can be researched are the brand of EDs most appropriate for certain groups of students and whether explicit teaching of ED skills enhances ESL student learning of English using the ED.

Finally, I wish to stress that using the ED is not the be-all and end-all of learning an additional language. Indeed, it is one of many strategies. While teaching dictionary skills to maximize the benefits of using the ED, the teacher has to devise tasks to move students away from translating to guessing from context, in order to enable them to see that they can still understand a text passage without looking up the meanings of all the unfamiliar vocabulary items.

Note

¹Names have been changed.

The Author

Gloria Tang is an assistant professor in the Department of Language Education at the University of British Columbia, having previously been an ESL teacher and teacher educator in Hong Kong for over 20 years. Her research interests include using bilingual dictionaries, computer graphics, and graphic organizers to enhance acquisition of written and spoken English.

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