REPORT ON A.S. HORNBY DICTIONARY RESEARCH AWARD PROJECT

Title: Supporting Chinese EFL Learners' Dictionary Preferences
Country: United Kingdom
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Lead researcher: Yan Yan Yeung

1 BACKGROUND AND OBJECTIVES

There are huge numbers of Chinese EFL learners worldwide, but there has been little investigation of the dictionaries they use and their dictionary consultation habits. Accumulated evidence (see e.g. Wang 2019; Zhang et al. 2019; Liu et al. 2020) suggests that the electronic dictionaries (EDs) most commonly used and trusted by Chinese EFL learners are the ones made in China, such as Youdao Dictionary (Youdao henceforth), Bing Dictionary, Baidu and Jinshanciba. Despite the popularity of these EDs, prior studies have tended to focus on ED usability (or in other words their portability and functionality) and seldom shed light on the quality of their content, or their 'usefulness'.

This study aims to overcome the shortcomings of previous research by focusing on the 'usefulness' of a specific ED, Youdao, which was chosen based on the findings of a survey that showed it to be the most popular ED amongst the target population. The objective was to observe participants' dictionary strategies during receptive and productive tasks in a naturalistic setting to be able to evaluate the ED and understand how it is typically used.

Youdao Dictionary, developed by an IT company, NetEase, is an aggregator, that is, it brings together lexicographical material from a variety of existing sources. It is available in the forms

of desktop software, dictionary pen, mobile app, and online dictionary. Its desktop and mobile app versions have multiple free functions including full-text translation, translating texts captured as images (this function supports both images uploaded and screen capturing) and a vocabulary notebook, and paid services such as English tutorial lessons and human translation. Its online version is mainly presented as a resource where users can search for lexicographical information for search words. Users can also look up phrases and sentences in the search box to get a machine translation. Also, some Chinese scholars (Wang 2019, Zhang et al. 2019) have rated Youdao highly for its 网络释义 function, which can be directly translated as "definitions from the internet (网络释义)". In fact, the so-called "definitions from the internet" in Youdao contain equivalents and examples drawn from the internet based on the search word as the keyword rather than actual "definitions". Scholars have not evaluated the quality of this web-crawled material.

> Despite the popularity of these electronic dictionaries (EDs), prior studies have tended to focus on ED usability and seldom shed light on the quality of their content, or their 'usefulness'.

Despite its popularity, authoritative information about Youdao is difficult or impossible to obtain. Descriptions about Youdao vary from author to author and from website to website. On Youdao's official "About" page, it is claimed to be used by 700 million users, but on the official download page for the mobile app, it boasts an even bigger user base of 800 million (Youdao 2021). No lexicographical information is available on their official website, but some descriptive information can be found in journal articles and app stores. For instance, as explained in Wang (2019) and Microsoft Store (2021), Youdao contains entries of established dictionaries including *Longman Dictionary of Contemporary English* and *Collins COBUILD*, although the editions are not specified. Wang also stated that Youdao has over 37 million entries, over 650,000 English words, over 590,000 Chinese words and what the Microsoft Store (2021) referred to as a "mass" of 23 million, though it is unclear exactly what this means. In addition to the seemingly impossibly high numbers, some information makes little sense in lexicography (e.g. the term, "mass"). Also, the names of its editors are not provided, and no source corpora for the authoritative dictionaries are mentioned. In some cases, Youdao publicity material even seems to misname the source dictionaries. For example, the dictionary

referred to in Youdao as *Collins COBUILD Advanced Double Solution English-Chinese Dictionary* might in fact be *Collins Cobuild Advanced Learner's English-Chinese Dictionary*.

Youdao seems more interested in the quantity of words and entries its technology has enabled it to collect than the quality of its lexicographical content. One prominent problem caused by this priority is the inclusion of unattested words (e.g. *linguister*, *linguistician*), misspelt words (e.g. there is an entry for *wheather* in which the Chinese equivalents are related to *weather* but the examples show the use of *whether*), and words with morphological errors (e.g. there are separate entries for the verb forms *breaked* and *catched* and noun forms such as *criterias* and *geeses*). These entries provide Chinese equivalents and English examples. In the entry for *catched* (Figure 1), for instance, there are 24 examples in English gathered from various Chinese sources including examples from other Chinese-made EDs, personal blogs and essay banks. Users of Youdao and even previous studies seem largely oblivious of issues of this sort, even though they can have a significant impact on usefulness.

Figure 1 'Catched' in Youdao

2 DESCRIPTION OF RESEARCH

This study gathered information from participants about the way they used Youdao while performing language reception and production tasks.

2.1 The Participants

Target participants had to meet the following criteria:

1)   currently studying at a university in an English-speaking country;
2)   EFL learners with at least 10 years of English language learning
        experience in China;

3)   native Mandarin Chinese speakers;
4)   users of Youdao Dictionary;
5)   willing to undertake writing tasks.

To attract a large number of potential participants, the recruitment process was carried out digitally through a short online survey that took less than three minutes to complete. The survey questionnaire collected the necessary information to determine whether the participants met the inclusion criteria. The link to the survey was distributed through:

1)   advertisements on my own WeChat timeline. (WeChat is a social app commonly used
        by students from Mainland China);
2)   requests to publicise the study sent to Chinese student societies at over 40 UK
        universities;
3)   convenience sampling and snowball sampling.

In this way, 53 valid responses were collected, with 41 respondents self-reporting as users of Youdao, 32 of whom showed interest in participating in the observation. After a brief conversation with these 32 respondents, 21 invitations were sent, and 20 agreed to participate in the tasks. All the participants were UK-based.

2.2 Youdao Dictionary

Youdao was the only ED used in this study. The desktop application of Youdao was used in 16 of the observations, while the online version was used in the remaining four.

An entry in Youdao usually consists of five parts:

- The first part is a local dictionary which provides only translation equivalents.
- The second part is the so-called "definitions from the internet" which has three sub-entries: general, specialised and/or monolingual "definitions", which are actually equivalents with examples. The first two sub-entries contain web-crawled information from a wide range of Chinese sources from personal blogs, newspapers, forums to restaurant menus and advertisements. Although the selection criteria are not specified, the examples appear to have been selected because they contain the search word. The "monolingual definitions" sub-entry only appears in English-Chinese consultations. This part contains full entries from WordNet, a lexical database developed by Princeton University.
- The third part contains simplified versions of entries from established bilingualised dictionaries. In the case of English-Chinese consultations, entries published by Collins or Oxford University Press are shown. Specific information regarding how the entries are simplified is not provided. In the case of Chinese-English consultations, entries published by 新汉英大辞典 [xin hanying da cidian] are shown. It appears that this source dictionary has been misnamed, but it could be 新汉英辞典 [xin hanying cidian] (*A New English-Chinese Dictionary*) or 新世纪汉英大词典 [xinshiji hanying da cidian] (*New Century Chinese-English Dictionary*).
- The fourth part contains common collocations, synonyms, antonyms and/or derivations from unidentified sources.
- The fifth part is examples drawn from various sources, including other Chinese-made EDs, established Western dictionaries and the internet. However, the algorithm appears to select examples mainly based on the search word, and it is common for them not to contain any of the words provided as equivalents at the top of the entry, and not to demonstrate the lexical or syntactic behaviour of the search term The examples may even include words contained in the multi-word expressions the user looked up, but as separate items, in different parts of the example sentence.
- Occasionally, there is an additional part with encyclopedic information drawn from the Baidu encyclopedia (the Chinese equivalent of Wikipedia).

When users start to look up more than one word (e.g. a phrase or a sentence), they are automatically redirected to the machine translator.

There is no difference in terms of lexicographical content between the desktop application and the online version. The main difference between the two versions is the addition of extra

functions in the desktop application: full-text machine translation from texts in photos or screen capture, quick pop-up entries by pointing at a word with the cursor (Figure 2), and a drop-down menu which shows words that are listed near the intended look-up word (Figure 3).

Figure 2 Quick pop-up entry for 'unease' on the Youdao desktop app

Figure 3 Drop-down menu appearing when looking up 'unease' on the Youdao desktop app

2.3 The Observation

The observation consisted of two summary tasks. In the first task, participants were required to read a Chinese article and produce a summary in English (i.e. a productive task). In the second task, the participants were asked to read an English article and produce a summary in Chinese (i.e. a receptive task). Both articles were less than 1.5 pages in length. They were non-technical but contained unfamiliar words that participants would very likely need to look

up to fully understand the texts. The recommended length of each summary was about 150 words, and participants were advised to spend around 20 minutes on each task. However, to ensure that the observation was as stress-free as possible and to encourage natural look-up behaviour, I did not intervene during the tasks or set strict limits on the word count and time frame. As a result, the completion time for the observations ranged from 45 minutes to 2.5 hours.

Translation tasks have been used in many previous studies, but the requirement to summarise rather than provide a word-for-word translation meant that participants could enjoy greater autonomy and had the opportunity to express the meaning of the texts in their own words. The summary tasks used in the observation were therefore a closer simulation of their usual learning activities at a UK university, which would require them to read widely and summarise the research literature rather than simply translate the literature they read.

Participants took part in the observation individually, and were encouraged to think aloud (i.e., verbalise everything in their minds as they completed the tasks) if they were comfortable with this procedure, although this was not compulsory. During the tasks, they were free to use Youdao as they thought fit but were explicitly told not to use the full-text translation function. They were required to use the "share screen" function on Zoom so that I could closely observe how they used Youdao and whether this was to solve linguistic problems. The entire process was video recorded, and I also took additional notes in real time concerning their dictionary-using behaviour. The summaries were analysed in conjunction with the video recordings and notes to identify consultation processes and evaluate their consultation successes or failures.

2.4 The Reading Materials

The two selected readings were on different topics to eliminate the possibility of recycling ideas and words.

The Chinese reading was extracted from a column published in Financial News China, entitled *From Tao Te Ching to the Dunning-Kruger Effect*, comparing the similarities between a philosophy from the classical Chinese text Tao Te Ching and the Dunning-Kruger Effect, both of which were about the mismatches between one's actual knowledge and one's own abilities. In other words, the less one knows, the more one thinks one knows, and vice versa. The details of the application of these concepts to business management were edited out to keep the reading material non-technical. The edited text consisted of 1332 characters.

The English reading was extracted from a journal, *Politico*, and entitled *Behind Woodward's September surprise: White House aides saw a train wreck coming, then jumped aboard.* This described the long process by which the former US President, Donald Trump, tried to arrange an interview with a veteran journalist, Bob Woodward. The article was trimmed down to 671 words, with comments from senior Whitehouse aides and political figures removed.

In terms of numbers of words, the Chinese text may at first glance seem to be double the length of the English text. However, there is no space between words in Chinese and the definitions of a 'word' in Chinese vary, so it is difficult to count the exact words in a text. As many Chinese 'words' are bi-syllabic or multi-syllabic but each character only represents one syllable, the number of 'words' the participants had to process in both texts was, in fact, roughly similar.

2.5 The pilot study

A pilot study was carried out to inform necessary adjustments to the summary tasks and ensure that the reading materials were non-technical, while still containing enough unfamiliar words that might require dictionary consultation.

Two graduates took part in the pilot study: one was awarded an MA in Applied Linguistics from the University of Nottingham in 2017, and the other was awarded an MA in Translation Studies from the University of Birmingham in 2015. Both received distinction grades and had been working in the UK since graduation while pursuing second Master's degrees. Their command of the English language was assumed to be higher than that of most of the participants in the main study.

It took the pilot participants 20 minutes to complete each task. In the follow-up chat, they explained that they liked the freedom of the summary tasks and preferred this form to translation. They also approved of the choice of reading materials and said both were interesting reads. However, they confirmed that despite knowing that their language competence and grammar would not be judged, they still took time to polish their writing, and they did read the entries with caution. They were also asked to rate Youdao in terms of usefulness. When asked to confirm their ratings, one of them admitted that she deliberately gave Youdao a lower score than she thought it probably deserved, while the other said he had given it a higher score than he thought it probably deserved, because he did not feel he was qualified to criticise it. Interestingly, they both believed they had adjusted their scores to please me, as the researcher, in the context of the study. It is indeed worth bearing in mind that the observer's paradox (which according to Labov (1972), refers to a situation where the

observer's presence influences the phenomenon being observed) might have affected my observations in this study. The effect of the paradox might even have been exacerbated due to the naturalistic setting of the observations, as the restrictions and instructions were only minimal, leaving participants more room to speculate about what the researcher would want to see or hear.

2.6 The semi-structured interview

For the main study, I conducted follow-up semi-structured interviews with each participant immediately after each summary task. In these interviews, I asked retrospective questions such as "I notice you paused for a while [X]. What were you thinking at that moment?", "How much do you think Youdao has helped you with the tasks?", "Are there any interesting facts you discovered during the tasks you want to share with me?", "You looked up [X], and you chose [X] out of the list of equivalents, why?" and "To what extent would you say your behaviour was typical of the way you use Youdao in daily life?"

I also required each participant to rate, from 1 to 10, how helpful they thought Youdao was for language production and reception, and provide reasons for their ratings.

I tried to understand why the participants chose to use or not to use the dictionary, whether and how often the dictionary helped them solve their problems, and their opinions about the usefulness of the dictionary. The interviews took a maximum of 20 minutes.

3 RESULTS, EVALUATION AND DISSEMINATION

In this section, I will focus on the major problems that led the participants to make unsuccessful look-ups and review the extent to which Youdao was helpful throughout the tasks.

In the following parts, Chinese words will be presented in pinyin (a romanisation of the Chinese pronunciation) followed by my own English translation, as in 阅读 [yuedu] (read/ reading).

3.1 The Receptive Task

Although 20 students participated in this task, due to a reluctance to fully comply with the rules of the task, two of them did not provide sufficient data to determine whether their consultations had been successful. These two cases will be further discussed below.

In general, three common look-up patterns were identified:

1. seeking confirmation of the assumed meaning of recognised words;
2. checking the meaning of unknown words;
3. using Youdao's various machine translator functions rather than consulting dictionary entries.

The first two patterns are normal dictionary-using patterns. In this study, however, both of these patterns usually entailed reading the top parts of the entries, very briefly. This meant that the participants only read the Chinese equivalents in the default local dictionary and/or the equivalents collected from unknown sources on the internet.

The third pattern has rarely, if ever, been talked about despite it being an understandable trend considering recent technological advances and users' interest in quick fixes to their problems. This pattern means that the searches were not confined to single search terms, and some searches were made through screen capture. For instance, when trying to understand the title "White House aides saw a train wreck coming", different participants looked up *wreck*, *train wreck*, *a train wreck*, *train wreck coming* and *a train wreck coming*, not all of which were conventional dictionary search terms. As participants were explicitly told not to use full-text translation, some of them resorted to typing into the search box phrases, clauses or sentences from the text, such as *take down a president*, *under 8 weeks*, *delivering Bob Woodward an unprecedented nine hours of access across 18 interviews*. Among the total of 282 searches made, 76 were for single words including one for the unattested word *unprecedent*.

> Participants confirmed that they only took a quick glimpse at the Chinese equivalents if they looked up words (or phrases) that they thought they recognised in the English text. However, it was not uncommon for participants to misjudge their own knowledge of the look-up words or phrases.

3.1.1 Seeking confirmation of assumed meaning

In the retrospective interviews, participants confirmed that they only took a quick glimpse at the Chinese equivalents if they looked up words (or phrases) that they thought they recognised in the English text. In the most extreme cases, two participants spent less than a second on

relevant entries, which was so fast that I could not even read what was on the screen before they closed the dictionary.

Such a quick scanning habit did not cause look-up failure when the words or phrases in question were as basic as *interview*, *love to*, *senior staff* and *pandemic*. However, it was not uncommon for participants to misjudge their own knowledge of the look-up words or phrases. The following examples illustrate this type of misjudgement:

● *Resigned to* (as in the sentence "But aides also <u>resigned</u> themselves <u>to</u> the months-long process of Woodward interviews and calls, knowing the president was interested himself.")

Two participants said they knew the word 'resign' so they only looked it up to confirm that it meant 'to quit a job'. After a quick glimpse of the entry, they believed that the aides quit the interview process so that Trump could take part by himself. The participants were unaware of their lack of knowledge of the phrasal verb 'resign oneself to something'.

In the entry for *resign* (Figure 4), it appears that for each part of speech the first Chinese equivalent contains the bound morpheme 辞- [ci-], which gives the sense of 'to quit-'. The four Chinese equivalents for *resign to* are translated as "to entrust", "to quit a job", "to give up" and "to quit a job".

Figure 4 Entry for 'resign' in Youdao

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- *Open up* (as in the sentence "Aides spent months fretting about President Donald Trump *opening up* to the famous Watergate journalist […]")

One participant knew 'opening up' from the context of China's Reforms and Opening-Up policy. She skim-read the entry and selected the Chinese equivalent with the sense of economic or product development (开发 [kaifa]) without realising this equivalent was not context-appropriate.

While the above look-up failures might be attributed to the participants' misjudgement, they also provide evidence of Youdao's failure to support its users by creating 'useful' entries. In the case of the entry for *open up*, no equivalent provided the figurative sense of 'expressing one's true feelings'.

3.1.2 Checking unknown words

Youdao's pop-up windows showed simplified versions of entries from the local dictionary and equivalents and examples extracted from the internet and were revealed when the user pointed the cursor at a word on the screen. This feature was popular among participants who owned the desktop app, as they considered it a highly efficient tool to achieve almost uninterrupted reading. I initially thought that this function was problematic, as the entries in the pop-up windows were simplified, and the function encouraged users to scan them very quickly. However, I later found that the pop-ups could sometimes prevent users from looking at entirely wrong entries for their target words. For instance, one participant who did not use this function looked up *aids* instead of *aides*. This would not have happened with the pop-up tool, because the function recognises words on the screen without the need to type them into a search box. On the other hand, the pop-up entry function failed to recognise multi-word units such as *train wreck*, and overall, the observation results showed there was no correlation between consultation success and use of the pop-up tool as opposed to manual searching.

For the receptive task, the meaning of a word would be the participants' main concern, and the form and use might not matter very much because although the text was in English, the participants wrote their summaries in Chinese. However, even though they concentrated on word meaning, many participants failed to locate the most context-appropriate equivalent for polysemous words, especially when the meaning was figurative. This finding is in line with findings by Nesi and Haill (2002). In the following example from the English text, *bombshell* has a figurative meaning:

- "Aides [...] fearing the consequences all the way through Wednesday's *bombshell* revelations."

After using the quick look-up function, two participants selected the first Chinese equivalent provided, which means "an artillery shell''. One of these participants thus interpreted the original sentence as "Trump's aides were worried about the bomb incident on Wednesday", while the other came up with an incomprehensible Chinese translation similar to "the revelation of a mega bomb". In fact, the more context-appropriate word that might be translated as 'a shocking person or incident' was given as the third equivalent in the local dictionary entry.

bombshell

英 ['bɒmʃel]　美 ['bɑːmʃel]

n. 炸弹；突发事件；引起震惊的人或事
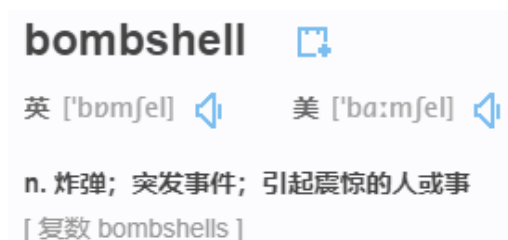[复数 bombshells]

Figure 5 Bombshell in Youdao

The second example of confusion over meaning related to the word *veteran* in this example:

- "He made clear to aides that [...] he could charm and cajole a *veteran* Washington journalist into seeing his point of view."

Two participants selected from the first two Chinese equivalents, which were 老兵 [laobing] (an old military man) and 退伍军人 [tuiwu junren] (a retired military man). They thus believed that Trump was trying to persuade an old/retired military journalist to believe his stories. However, 经验丰富的 [jingyan fengfude] (experienced) and 老练的 [laoliande] (sophisticated) were actually provided later in the entry.
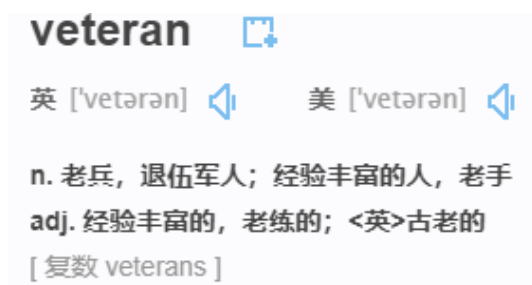

veteran

英 ['vetərən]　美 ['vetərən]

n. 老兵，退伍军人；经验丰富的人，老手
adj. 经验丰富的，老练的；<英>古老的
[复数 veterans]

Figure 6 Veteran in Youdao

Both the *bombshell* and *veteran* examples are a consequence of selecting earlier meanings for the headwords, rather than more appropriate translations listed later in the entries and failing to consider the possibility that the words also had figurative meanings.

> Almost every single entry in Youdao contains one or more compilation problems that have the potential to mislead or confuse users.

However, selection errors in relation to unknown words were not always entirely down to the users and were sometimes due to the poor quality of Youdao entries. Almost every single entry in Youdao contains one or more of the following compilation problems that have the potential to mislead or confuse users:

● Inclusion of archaic senses without any warning note.

According to COBUILD, the sense of 炸弹 [zhadan] (an artillery shell) for *bombshell* is dated.

Yet in Youdao, it is presented as the first equivalent (see Figure 5) without any note to warn users of the lower frequency of this sense nowadays.

● Mistranslation

According to various expert-produced English monolingual dictionaries, *bombshell* refers to 'sudden bad news'. However, the second Chinese equivalent in Youdao suggests that it only refers to a 'sudden incident' and the third one refers to 'a shocking person or incident'. Both equivalents are presented with some loss of meaning.

Aide/aides (Figure 7) was the most consulted word. Some participants looked it up three times but still failed to understand who these 'aides' were. This is because the sense of 'aide' as an assistant to an important person, especially a political leader, is not provided in Youdao. Based on the Youdao entry, an *aide* could be an assistant in general, or an assistant in the military.

Figure 7 'Aide' in Youdao

- Erroneous information in both English and Chinese

Participants who read the whole entry for *aide* also found 'friend' given as a synonym (see Figure 7). This is not typically considered to be a synonym of *aide* and indeed is not found in any established Western dictionaries.

One participant read the whole entry for *resign* (Figure 4), found the sub-entry for *resign to* and decided that the relevant sense was a Chinese word 托付给 [tuofu gei] whose closest equivalent in English is 'to entrust'. She ended up interpreting "aides also *resigned* themselves *to* the months-long process" as "the aides *assigned* someone to take care of the interview for Trump." As we can see in Figure 4, the Chinese equivalent of *resign oneself to* was provided in the top part of the entry, but this conveys the idea of making someone submit rather than of accepting something passively.

Fret/ fretting was another word that 14 participants struggled to fully understand with the aid of Youdao. Three participants looked up *fret* in "Aides spent months *fretting* about President Donald Trump […]". However, the *fret* entry provided erroneous information, suggesting that

'fret' is a transitive verb: 使烦恼 [shi fannao] (to make someone annoyed) or suggesting that 'fret' is a part of a musical instrument. Those who looked up *fretting* found an entry containing Chinese words relating to 侵蚀 [qingshi] (corrosion). A few participants therefore gave up on this word, believing that it was, in the words of one participant, 'too advanced and figurative for their level of competence'; one participant interpreted this as a figurative use of 'corrosion' meaning 'to corrupt one's mind' and thus concluded that 'it means to persuade'.

Figure 8 Entry for 'fretting' in Youdao

Since the completion of the observations, it appears that Youdao has updated the entry for *fretting* and added '(-ing form of fret)', but only after one of the suggested translations, meaning 'corrosion' (see Figure 8).

● Irrelevant information

The problem of irrelevant information exists in many entries in Youdao. *Bombshell* is one example, where the part of the entry providing "definitions from the internet" contains equivalents and examples gathered from unknown sources, including titles of movies and video games. Thus, even users who do opt to read beyond the first couple of senses may face confusion.

● Entries with morphological errors

One participant believed that 'unprecedent' was the stem of 'unprecedented', a hypothesis that seemed to be confirmed when he successfully located an entry for *unprecedent* in Youdao containing three 'definitions from the internet' that showed three equivalents with examples

drawn from unnamed Chinese sources. This word, however, is not listed in any of the established English learners' dictionaries.
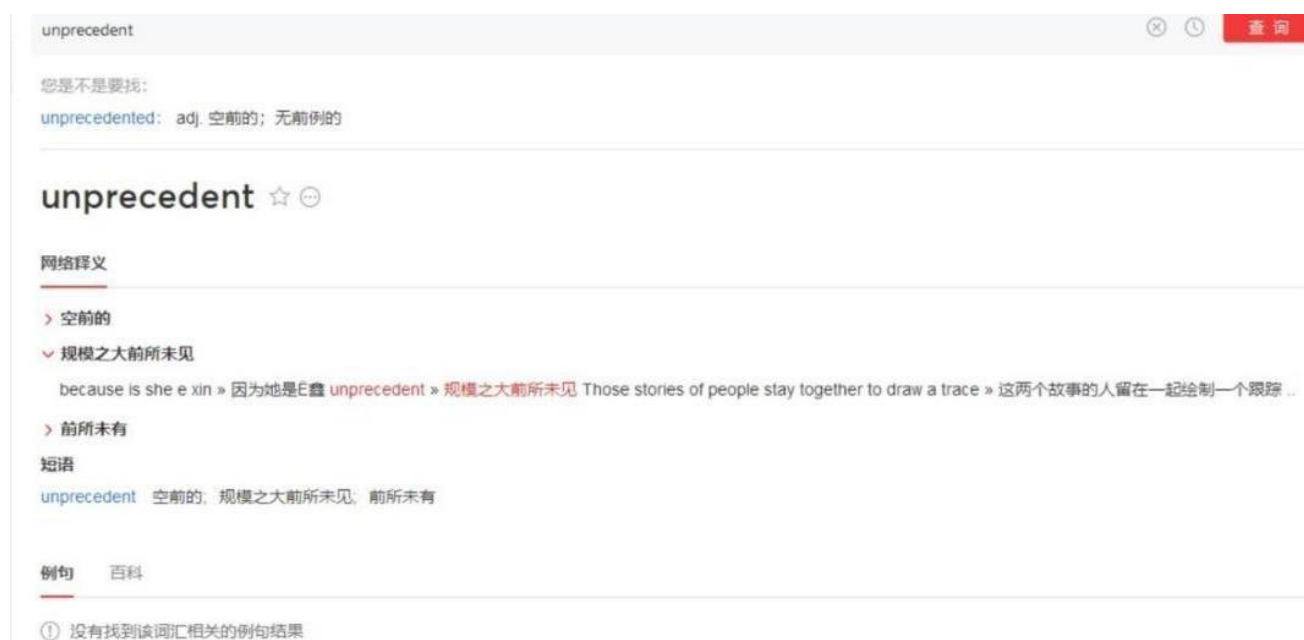

Figure 9 'Unprecedent' in Youdao

3.1.3 Using the ED as a machine translator

As mentioned above, two participants did not fully comply with the rules of the tasks. That was due to their reliance on the full-text translation function of Youdao. In fact, these two participants were referred by another participant who withdrew from the observation once he realised the differences between the dictionary and the translator. These two participants, both self-identifying as heavy users of Youdao, agreed to use the dictionary. However, their strategy was to copy each paragraph and paste it into the search box in the dictionary, which presented them with a machine translation. When they were requested to look up each word, they lost interest and merely scrolled up and down the article, complaining about the difficulty of the task.

The preference for machine translation was in fact a widespread phenomenon in the observation. As mentioned earlier, it was common for participants to look up sentences and clauses rather than individual words. Most of them believed that the translator was 'very good'. One participant, who used the translation function through screen capturing paragraphs from the text, questioned my research design because "the translator is basically a dictionary but way more advanced." Another participant confirmed that the observation changed her

understanding of a translator and a dictionary, stating that she would give the translator 9 out of 10 but would only give a rating of 6 for the dictionary, because the translator spared her the stress of selecting context-appropriate equivalents. There were also remarks such as "after this task, I realised the translator is much more efficient."

This was a rather depressing discovery for me as a researcher, a language teacher, and an experienced language learner. Youdao has created shortcuts for Chinese EFL learners so that they can quickly find solutions they are satisfied with, allowing them to side-step the cognitive process of examining word use in context.

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3.1.4 Participant ratings

On average, Youdao received a rating of 7/10 from participants for its usefulness in facilitating language reception, with the lowest rating being 3 and the highest 10. The lowest ratings reflected the frustration of the two participants who showed strong resistance to using the dictionary function. Thus, overall, despite all the peculiar information participants found in the entries and the inadequate support Youdao provided, they were still happy with it as an ED.

One comment from the retrospective interviews summarises a belief commonly held by the participants:

"The dictionary has no problem. It's my own problem not knowing how to make sense of the words in the sentences."

In fact, many of the participants did express doubts about what they found in Youdao, but eventually blamed their own understanding rather than the dictionary and were willing to adjust their textual interpretations to fit the erroneous information provided in Youdao's entries.

One factor contributing to the high rating is the fact that Youdao's technology allows it to bring together material from various sources. However, the participants did not seem to be aware that, in many cases, information about English usage had been drawn from Chinese sources,

including examples from other Chinese EDs and essay banks. The risk is that aggregation recycles common mistakes made within the Chinese EFL learner community, and only reinforces users' misconceptions.

Based on the comments from different participants, another reason for Youdao's high rating appears to be its functionality which allows quick look-ups through the pop-up entries, and the machine translator functions which support translation of texts on-screen. During the interview, one participant was particularly keen to demonstrate the use of text translation with the screen capture function, suggesting that it was 'very handy' when reading secured PDF files that do not allow copying. This suggests that, in the eye of the users, usability largely determines their preference for the tool.

3.2 The Productive Task

All 20 participants took part in this task, which, as described above, was to write a summary in English of an article originally written in Chinese. For this task, participants consulted the dictionary between 5 and 31 times. One participant looked up only full paragraphs, and another participant looked up mainly sentences, while the other 18 participants consulted the dictionary for a mix of words, phrases and sentences in Chinese and English. Some of the looked-up items were directly extracted from the text, but more often, the items were the participant's interpretation of the original words. This strategy will be further discussed in 3.2.4. As one might expect, compared to the receptive task, significantly more errors were made by the participants in this productive task.

Problematic look-up patterns could be categorised into three main types:

1) choosing the wrong word class in the correct entry;

2) inability to locate a context-appropriate equivalent in the correct entry;

3) consulting the wrong entry;

A fourth pattern relates to avoiding ED consultation, even when unsure about the use of English words.

The first three patterns have been discussed in several prior studies (see e.g. Nesi and Haill 2002 and Tseng 2009). However, the current study also noted that errors could be due to the poor quality of the dictionary entries and/or the characteristics of the Chinese language (i.e. L1 interference).

The fourth pattern was rather common among the participants in this study. This could have been due either to overconfidence, or, as one participant explained, because they wanted to impress the researcher and did not want to admit to a lack of knowledge about word use.

3.2.1 Errors in word classes

Participants in this study often failed to choose translation equivalents with context-appropriate word classes. This phenomenon was particularly apparent when they interpreted compound words in the Chinese text, as can be seen in Figure 10, where the four words the participant looked up are highlighted in blue.

Clever People always know and realize which area or what do they lack, they would discovery and learn how to develop these things. However, ignorance people would never check their disadvantages and they probably always feel arrogant.

The different in Dunning-Kruger Effect:

This theory has more exactly annotation about different people character or mind would influence their confidential extent.
2 and 3 questions.
(1) Ignorance people, always busy but no high-quality result.
    (2) Anti-Intellectualism people, they trust their own experiences do not believe science or logic.
    (3) Feudalism people, they cancel the communication with others, or some new thing happened.
    (4) Impulsion but no wisdom people, they do everything without any plan or fact.

Figure 10 Summary by Participant #7

One compound word from the text, 盲目冲动 [mangmu chongdong] (blind and compulsive) appeared to be the most challenging for the participants. Thirteen participants looked this up, either as a compound word or by separating it into two free morphemes. Two eventually skipped the word, and the rest of them made word class errors such as:

- "Impulsion but no wisdom people" (see Figure 10)
- "Impulse blindly"
- "Impulsive blind"
- "being close-minded or impulsiveness"
- "Impulsiveness blind"

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Figure 11 *盲目冲动 [mangmu chong dong] in Youdao*

As shown in Figure 11, the erroneous "impulsiveness blind" was provided in the Youdao entry as a translation of the Chinese compound word. The other forms appeared to be selection errors made when referring to the entries for the separate morphemes.

In the original word 盲目冲动 [mangmu chongdong], the two free morphemes 盲目 [mangmu] (blindness/blind) and 冲动 [chongdong] (impulse/impulsive) are polysemous and can function as nouns or adjectives depending on their position in the clause. Discussions with the participants revealed that some of them believed that 盲目冲动 [mangmu chongdong] was a combination of two nouns (i.e. blindness + impulse), some believed that it was two adjectives (i.e. blind + impulsive), and some believed that the first morpheme modified the second one in some way (i.e. blind impulse/ blindly + impulsive). I agree with them that 盲目冲动 [mangmu chongdong] can be described as either a parallel compound or a modifier-head compound. However, regardless of the morphology of the Chinese compound, the translation in the Youdao entry that came nearest to being acceptable was the first one, "blind impulse". Unfortunately, the ungrammatical "impulsiveness blind" was preferred by the participants.

One participant provided the interesting explanation that "盲目冲动 is a two-in-one word that combines two adjectives to make a noun, so I chose the relevant equivalents and combined them to make a noun." However, in his summary he translated it as "blindly impulsive", which is not a noun.

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The core of the problem here appears to be L1 interference. In Chinese, word forms do not usually change according to word class, so L1 Chinese speakers may not have the same conception of word class as L1 English speakers. This leads to problems when translating into English, where word forms often indicate their word class. The ambiguity in their first language is therefore an obstacle in their second language learning.

3.2.2 Difficulties with locating context-appropriate equivalents

Participants found the correct entry in many cases but failed to select the most context-appropriate equivalent. These selection errors were either due to the participants' lack of consultation skills or to defects of the ED.

- Participants' misconceptions

As in the receptive task, participants frequently made selection errors due to their misconception that most, if not all, equivalents were synonyms, and therefore interchangeable. When translating 高明的境界 [gaomingde jingjie] (a masterful state), two participants chose *realm* rather than *state* to translate 境界 [jingjie]. Both translation equivalents were provided in the dictionary entry, but one of the participants believed that *realm* belonged to a higher register, and the other thought that *realm* had a higher currency because it appeared more often across the entry. (*Realm* only occurs 1291 times in the British National Corpus). As the presentation of the entry for 境界 gave the participant the impression that *realm* has a higher currency than *state*, this could be another defect to be improved. Both participants were unaware that the senses of the two English words do not overlap as much as their Chinese translation suggests. In the case of 高明的境界, the characters 境界 refer to a condition or a position, and thus the more appropriate equivalent should be *state*. Other examples of this type of misconception included:

- 成本[chengben] (cost)

  "[...] one might be based on wrong judgement and make decision without considerations of costing and outcomes"

Here *costing* was selected instead of *cost*. Although *costing* refers to an estimate of costs rather than being the cost itself, such information was not provided in the Youdao entry.

- 正视 [zhengshi] (to face up to/ to confront a problem) (see Figure 12)

  "[...] people could not know or envisage the personal shortages"

In this case, the participant selected 'envisage', one of the translation equivalents provided in Youdao's local default dictionary, although the more appropriate equivalent was given later in

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the entry. The participant claimed that she knew the word, so she only consulted the dictionary for confirmation. When asked to define 'knowing a word', she replied that she had "learned it before." According to COBUILD, the current meaning of *envisage* is 'to visualise' or 'to form mental image of', and the sense 'to confront' is archaic. It is unclear whether the participant learned the archaic meaning of the word or misremembered the current meaning.

Figure 12 正视 [zhengshi] in Youdao

As discussed in 3.1, selection errors might not always be the participants' fault, because Youdao contains many defects that can directly lead to consultation failures. In this section, we have seen compilation errors similar to those discussed in 3.1 such as 'impulsiveness blind' in the entry for 盲目冲动 [mangmu chongdong] shown in Figure 11, and archaic senses without any warning that they were archaic, as in the case of 'envisage' presented as the first equivalent of 正视 [zhengshi] (see Figure 12). The following are some additional issues that have not been covered previously.

● Meaning lost in translation

This was also an issue specific to the receptive task. When Youdao did not provide a translation of *aides* with the correct contextual meaning, it came to the participants' attention because it hindered their interpretation of the text. In the productive task, however, participants were usually unaware of the connotations of the English equivalents. An example is:

● 沉浸在 [chenjinzai] (literal meaning: to soak in; figurative meaning: to indulge in).

"They immersed in an unreal atmosphere"

In the context of the original text, 沉浸在 [chenjinzai] had the figurative meaning "to indulge in" as in "to indulge in fantasies". This use was not provided in the entry. All the equivalents provided in Youdao (i.e. *immersed in*, *soak*, *on cloud nine*) appear to have positive connotations.

Figure 13 沉浸在 [chenjinzai] in Youdao

Thanks to one participant, another entry with the same type of error was discovered by chance. This participant asked me to help her 'dock' her wordy CV. In the entry for the headword 剪短 [jianduan] (to trim/ to cut), *dock* was presented as the third equivalent after *cut* and *clip* (Figure 13). The participant was unaware that the verb *dock* usually means 'to shorten' when the object is an animal's tail or to cut someone's pay. The omission of collocation information can be dangerous as it is capable of leading users to produce incomprehensible utterances.

Figure 14 剪短 [jianduan] in Youdao

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● Erroneous or misleading examples

Only five participants read the examples provided towards the end of the Youdao entries. These participants used them to try to identify the most context-appropriate equivalents, but only one directly copied the examples, in the following two cases:

- 违背常规 [weibei changgui] (non-observance of rules)

  "doing things out of wack and having a morbid fascination with personal experience."

- 盲目冲动 [mangmu chongdong] (blind and impulsive)

  "doing things only with a blood rage and a blindness satisfied, and without considering costs and results."

In addition to the misspelt "whack" in the first example, which the participant did not notice, the two examples showed problems with register: 'out of whack' is colloquial and 'blood rage' appears to be poetic, making both inappropriate for this summary. These errors might have been avoided if there had been restrictive labels to indicate register.

One participant was more aware of problems with the examples provided by Youdao. In particular, she noted that not all examples contained English equivalents. For instance, there was no mention of the word 'march' in some of the English examples in the entry for 长征 [changzheng] (long march) (Figure 15), and 'stable/steady' was absent from some of the English examples provided in the entry for 平稳的 [pingwende] (stable/steady) even though these words were presented as the English equivalents.

Figure 15 Examples of 长征 [changzheng] and 平稳的 [pingwende] in Youdao

The fact that most Chinese examples were unnatural, if not ungrammatical, went unnoticed by all the participants.

From the above discussion we can speculate that there are serious problems with the technology used by Youdao. The algorithm seems to use Youdao's machine translator to translate texts from English into Chinese, and then select examples to illustrate English usage according to whether they contain a translation of the original Chinese search term. This is the reason why some examples do not contain the English equivalents given earlier in the entry. One entry that further exposes the compilation errors caused by Youdao's technology is the entry for 海归 [haigui] (students returned from overseas):

海归

3. 男人，女人，海归，金钱与幸福。
   Women, men, Money and Happiness.
   www.rosebushbeauty.com

4. 海归的力量明显的增加了。
   The power of hai gui is visibly growing.
   article.yeeyan.org

5. 有些知名度不够的国内科学家排斥这些海归科学家。
   Some scientists with weaker resumes have shunned returnees.
   article.yeeyan.org

6. 但是在晚上，海归妈妈会到岸上去产卵。
   But at night, mother sea turtles go to the beach to lay their eggs.
   3g.en8848.com.cn

Figure 16 Examples of 海归 [haigui] (returned students) in Youdao

Haigui is a homophone of both 海归 [haigui] (returned students from overseas) and 海龟 [haigui] (sea turtles). Looking at the errors that occurred in the examples, which are a mix of 'returned students' and 'sea turtles', it appears that Youdao not only uses an algorithm that selects examples based on the Chinese keywords but may also use speech recognition technology which is not able to differentiate between homophones.

Therefore, unfortunately, thanks to the compilation process, examples in Youdao do not tend to support users' understanding of the use of the English equivalents for Chinese items that they look up. However, as most participants did not read the examples in detail, the impact of inappropriate or misleading examples cannot be fully evaluated.

3.2.3 Looking up entirely wrong entries

When participants consulted the wrong entry, this was generally the result of differences between the morphology of English and Chinese which they may not have been aware of.

● Overgeneralisation of Chinese word formation rules

Many linguists regard the modern Chinese language as a 'language of compound words' because Chinese morphemes are highly productive. The error below was an attempt to present the meaning "blindly believe in one's experience" in a single word.

> "They deal with things by depending much on their _empiricism_ rather than trust the science and common sense."

The participant created the word 经验主义 [jingyan zhuyi] (experience + derivational suffix -ism) on the spot, and when he looked up this word, he was redirected to an existing entry for 经验主义 (empiricism). He was unaware that 经验主义 [jingyan zhuyi], whose English equivalent is _empiricism_, is a term referring to a scientific research method. _Empiricism_ was in fact the opposite of the meaning he was trying to convey. The participant mistakenly believed that the derivational suffix 主义 [zhuyi] (-ism) could be attached to any Chinese word to form a noun that denotes a principle, and thus this led to the consultation error.

In the error shown below, one participant looked up an adjective he found in the Chinese text. He found the correct adjectival entry in Youdao 自我营造的 [ziwoyingzaode] (_self-constructed_).

He was aware that he needed an adverb for his writing, so he added the -ly suffix to both words in an attempt to create adverbs, believing that the -ly suffix in English is as productive as the Chinese adverbial suffix 地 [-di].

> "obsessed with _self-constructedly_ visional situation"

Another Youdao entry for an unattested word which indicates lack of awareness of restrictions on word derivation patterns in English was _knowledgeless_ (Figure 17). Even though the word was underlined in red by her spellchecker the participant who came across this entry did not remove the _-less_ suffix. Instead, she added a hyphen, believing that the spellchecker only indicated a stylistic preference.

> "Self- approbation is more horrible than _knowledge-less_."

Figure 17 'Knowledgeless' on Youdao

- Errors due to the derivational suffixes 的 [-de] and 地 [-di]

In Youdao, there are different entries for headwords with and without the adjectival derivational suffix 的 [-de] and the adverbial derivational suffix 地 [-di]. This practice means users can easily end up consulting the wrong entries, particularly when looking up adjectives and adverbs.

The suffixes 的 [-de] and 地 [-di] may be confusing even for native speakers of Chinese. Many Chinese words can stand alone to function as a noun, adjective or adverb depending on their position in a sentence. The 的 [-de] and 地 [-di] suffixes are only needed in certain contexts, i.e. where they immediately precede a noun or verb. A discussion of Chinese morphology is out of the scope of this report, but simply put, many Chinese native speakers think of these suffixes as optional. Relevant production errors found in this study were mainly attributable to different information provided in the separate entries for both the form with the suffixes and that without the suffixes, such as the pair below:

- 自大 [zida] (arrogance/ arrogant) vs 自大的 [zidade] (arrogant) (see Figures 18 and 19)

One participant looked up 自大, which was used as an adjective in his summary. The participant ended up in the entry for the noun form. He eventually did not use these equivalents because he was unfamiliar with them. He did not seem to notice that the first equivalent, *arrogancy*, was archaic, or that the whole entry failed to provide the adjective he needed.

Figure 18 *自大 [zida] in Youdao*

Figure 19 *自大的 [zidade] in Youdao*

3.2.4 Pre-processing of Chinese words

In addition to the errors relating to the Chinese morphology described above, the characteristics of the Chinese language contributed to a set of dictionary strategies which have not previously been described, and which involve looking up Chinese alternatives to the Chinese words in the text. Except for the one participant who used the ED as a machine translator, all participants employed this set of strategies to some extent.

● Translating old Chinese words into contemporary Chinese

In China, it is generally believed that a good writer should master both old and contemporary Chinese vocabulary, and skilfully switch between the two systems. The Chinese text used for the production task inevitably contained 'old Chinese' (a.k.a 文言 [wenyan]) words, as it was a published magazine article. It is also common for Chinese speakers to include Wenyan words or idioms in their daily conversation to sound more witty or concise. Although Wenyan words are still widely used among native Chinese speakers, it can be difficult for them to explain these words in a second language. Below are some of their 'translations' from Wenyan words into contemporary Chinese words:

- 盲目冲动 [mangmu chongdong] (Wenyan, blind and impulsive) was translated as 不 计后果的 [bujihouguode] (have no regard for consequences, reckless)

- 好大喜功 [haoda xigong] (Wenyan, a word that describes a person with fondness for the grandiosity or excessive vanity) was translated as 虚荣 [xurong] (vanity/ vain)

In some cases, Wenyan words translated into contemporary Chinese lost some of their meaning . However, as described by some participants, such a process was necessary because, based on their experience, they did not expect the ED or any dictionary to have entries for Wenyan words. Other participants explained this habit of converting Wenyan into contemporary Chinese as "a reflex"; one stated that he did not 'translate' the Wenyan words and what he did was "just simplifying them" when he found the concept of the words too complicated.

- Interpreting contemporary Chinese words

Participants were highly aware of the Wenyan words in the text, and some complained about them during the task. However, most of them put just as much effort into rewording contemporary Chinese sentences as they did into changing the Wenyan words. According to some participants' feedback:

"Chinese writing doesn't usually mean what it says. There can be intentionally misused words because they look posh."

"Before consulting the dictionary, you have to understand the Chinese words first. For example, you can summarise the meaning of a paragraph into one word, then consult the dictionary with that one word."

These responses, alongside those regarding translating Wenyan into contemporary Chinese, help explain why, as mentioned at the beginning of 3.2, many search items were the participant's own words rather than the original words from the text.

One common approach used for interpreting contemporary Chinese items was to process figurative language and consult the dictionary for the equivalents of the literal meaning: One participant looked up 认清 [renqing] (to see clearly/ to identify) in place of 正视 [zhengshi] (literal meaning: to face someone or something directly; figurative use: to confront a problem), but although she thought the equivalent she found was suitable, she did not use it in her writing because she could not put it into the context.

Another participant looked up 陷入 [xianru] (be caught in) in place of 沉浸 [chenjin] (indulge in something). She selected an equivalent, 'fall into', from an internet example, and produced "_falling into_ the illusion of busy and nervous".

As discussed in 3.2.2, although not in the top part of an entry, the figurative meaning of a headword sometimes appears in the later part of an entry (see _zhengshi_ in Figure 12). Therefore, this process may not always be necessary. In some cases, participants' overinterpretation might backfire. The "feudalism people" in Figure 10 was a good example. When interpreting 思想封闭 [sixiang fengbi] (close-minded), the participant believed that 封建 [fengjian] (feudalism/ feudalistic) was the closest synonym. In fact, 封建 [fengjian] has a figurative use to describe people being backwards, but this figurative sense was not provided in the Youdao entry. This consultation failure might have occurred because the participant was unaware that the English equivalent does not function the same way as the Chinese word, or he was oblivious of the fact that 封建 [fengjian] only means 'close-minded' in Chinese when it is figurative. Thus, it appears that whether the pre-processing strategy can ensure successful look-ups also depends on the users' knowledge of their L1.

3.2.5 No consultation

Many participants confirmed in the retrospective interview that, when they played it safe and only used language with which they were familiar and comfortable, they believed that they would not make mistakes. Indeed, most of the time when participants did not consult Youdao at all, they tended to make simple lexical and syntactical choices. For instance:

● "Dunning-Kruger Effect classifies people into four types. The first type refers to [...] The second type refers to [...]"
● "If you do not do this, it is an illness."

Throughout the task, most participants showed the ability to self-correct lexical mistakes. However, errors were still very common:

- "Others may deem them as having <u>blind brave</u>."
- "According to Laozi, <u>wisdom man</u> knows its shortcoming."
- "If the people who know what they need to <u>approve</u>, they will learn by themselves or asking others."

When asked why they did not look up relevant Chinese words to confirm if their selection of English words was accurate, they said that they believed they had managed to "get around" the difficulty. Their responses suggested that the deliberate decision not to consult the dictionary was due to overconfidence.

3.2.6 Participants rating

Youdao received a 6/10 for its usefulness in facilitating language production, with the lowest rating 3 and the highest 8.5. These ratings, however, are less indicative of participants' opinions about the quality of Youdao as an ED. That is because most of the time the participants were not using the ED as a dictionary. They were unaware that once they looked up a phrase, a sentence or a paragraph, they would be redirected to the machine translator rather than a dictionary entry.

Despite only rating Youdao a 5/10, one participant made highly positive comments about Youdao:

> "Youdao is really good. It updates frequently, and it gets more accurate each time. More equivalents would be added in each update too. I think its improvement has been obvious these years."

The most common complaint regarding the quality of the ED was the lack of Wenyan entries, although many of them did not even attempt to look up Wenyan words. One participant who looked up the Wenyan words from the reading material directly used the equivalents provided by Youdao. He explained that "if I think the equivalent makes sense, I will use it. Youdao is usually very accurate." Another participant also observed that Youdao did contain Wenyan words that occur more frequently in contemporary Chinese texts. However, the equivalents both of them selected for *mangmu chongdong* were the ungrammatical 'impulsiveness blind', and 'impulsiveness', which did not fit the context.

Errors in the productive task were also frequently due to the participants' overconfidence. However, whereas in the receptive task participants might be aware of errors in entries which hindered their interpretation of the text, in the productive task participants were largely unaware of the erroneous information in the entries. The participants who selected

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'empiricism', 'feudalism' and 'with a blood rage and a blindness satisfied' from the entries, for instance, firmly believed that those were the equivalents they needed. It was quite surprising that more participants did not notice problems with the Youdao examples, which in many occasions were ungrammatical both in Chinese and in English.

An analysis of the Chinese-English consultation errors suggested that some might be caused by Youdao's algorithm, which selects examples and perhaps equivalents based on Chinese machine translations of the English source texts. The inclusion of entries for unattested words might also be a result of this technical issue.

3.3 Conclusion and recommendations

In addition to known dictionary consultation patterns, this study has revealed that one major problem for Chinese EFL dictionary users is the misjudgement of their knowledge of a known word, or the misjudgement of the reliability of the information provided by Youdao. In many cases, Youdao also played a significant part in look-up errors by providing misleading explanations or failing to supply a word, part of speech, or sense appropriate to the context, or failing to provide useful examples to demonstrate the use of the looked-up word or its equivalent.

> In addition to known dictionary consultation patterns, this study has revealed that one major problem for Chinese EFL dictionary users is the misjudgement of their knowledge of a known word, or the misjudgement of the reliability of the information provided by Youdao.

As it is highly unlikely that we will see improvements in these aspects of the ED, a more practical and feasible solution is to raise Chinese EFL learners' awareness of the potential problems in the ED. For English-Chinese consultations, when in doubt, at the very least, learners should be encouraged to confirm the meaning and use of the English headword, using the entries from the established Western dictionaries embedded in Youdao. Similarly, for Chinese-English consultations, users should be encouraged to regard information provided by Youdao with a critical eye and consult an established dictionary when needed. If users choose to cross-check the English equivalents within Youdao, it is, again, recommended that they should check the entries from the established Western dictionaries rather than the local

dictionary, or the "definitions from the internet". These steps could be time-consuming, however, so would require a high degree of motivation. It is not a surprise that even two out of the four PhD-level participants in this study preferred to use Youdao's machine-translator functions.

4 OVERALL REFLECTIONS AND FUTURE PLANS RELATED TO THIS PROJECT

This project aimed to determine how Chinese EFL learners use their preferred dictionaries when performing meaningful tasks under fairly natural conditions. Due to ethical considerations, participants had to be made aware that they were being observed so the observer's paradox was an inevitable limitation. In the two pilot studies, both participants were my close friends, and they did not mind disclosing that they had altered their ratings of Youdao to suit what they thought I wanted to hear. In the retrospective interview, one participant, who was also a friend, made the following admission:

> "To be honest with you, I actually did not look up as many words as I needed. I'm a man being observed by a smart, female researcher. I didn't want to look so lame, so there were many unknown words I skipped. I tried to get around things to save my face."

Although all other participants stated that their performance in the observation reflected exactly how they used Youdao on a daily basis, it remains doubtful that the paradox only occurred in one observation. The researcher's presence might have different psychological impacts on different participants. To mitigate this problem, researchers may explicitly remind the participants that they will not be judged personally.

Another way in which this study could have done better is in terms of the material used. To keep the formatting of the texts, PDF files were used. In the very last observation where the participant required the .docx files, I finally saw how the use of .docx documents performed similar functions to the think aloud technique. As the .docx documents allowed the participant to modify the texts, the participant was able to type the chosen equivalents right next to the looked-up words. Therefore, the words she looked up, the equivalents she chose, her struggles to select the correct equivalents, and her decisions whether to use those equivalents in her writing in the end were all clearly demonstrated.

Examples of their strategies and consultation outcomes will be incorporated into the free, open-access dictionary skills materials that I will prepare for use by university-level Chinese EFL learners. Links to the materials will be advertised via WeChat, a Chinese social media

app, and have the potential to help large numbers of students using bilingual Chinese-English electronic dictionaries to support their studies in the medium of English.

5 CONCLUDING COMMENTS

I believe this study will be beneficial for Chinese EFL learners and teachers and researchers interested in understanding these learners' strategies and the causes or reasons behind them. There are numerous EDs in China and it seems that the most popular ones are highly technologically advanced. As mentioned in many prior studies (e.g. Nesi 1994), rather than the quality or 'usefulness' of the dictionary, learners are more concerned about the overall user-friendliness ('usability') of the dictionary. Therefore, it is realistic to expect that users, regardless of their skill level, may exploit the translator function if an ED app has a built-in machine translator. At times, indeed, ED users may not even be aware of the difference between an ED and a machine translator. Those who rely heavily on machine translators may develop resistance to processing the L2 by themselves.

It is a frustrating fact, but also the reality that, with advancing technology, it will become tougher to 'convert' users of machine translators back to using the ED as an ED, especially those learners with lower motivation. Thus, it is essential to enhance learners' critical thinking ability and awareness of potentially false or problematic information in their preferred ED.

As for the problem with dependence on technology, machine translators, in particular, I hope that the data provided in this study have provided a basis for further discussion and will inspire other researchers and teachers to continue in their search for solutions.

6 ACKNOWLEDGEMENTS

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