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Technology Infused Learning: Developing Information Literacy in Translator Training

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Abstract

Translation technology is increasingly acclaimed in the translation market as it improves the efficiency and accuracy of human translation. In recent decades, universities in China have started to offer courses on translation technology as part of translator training. However, integration of translation technology in translator training remains problematic. What impact will greater information literacy (IL) regarding translation technology produce on students' translation quality? What are students' perceptions of IL and translation technology in the process of translation? Can IL be introduced to translation trainees at an earlier stage? The current study pursues answers to these questions. This project aims to investigate the relationship between students' IL and the quality of their translations. In a translation course, first-year student participants ($N = 32$) were given lectures on translation technologies with examples to demonstrate how they help solve translation problems. Students' translations before and after the lectures were compared to assess translation quality, and a survey was given to students to measure their perceptions of using technology in the process of translation. Results indicated that students' translation quality improved in the second translation drafts, with higher scores given by three scorers and fewer errors identified. Students also expressed greater confidence when doing translation and perceived the usefulness of the technological tools and resources. It is hoped that this research could provide some insight into the role of IL in translator training.

Keywords: information literacy, translation technology, translator training, student's perceptions

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Introduction

Translation technology has been acclaimed in recent years in the translation industry. The *2019 China Language Service Industry Development Report* (Translators Association of China [TAC], 2019) reveals that 80% of the surveyed strongly believed that translation technology could be used to reduce translation costs and 67% strongly agreed that it could be adopted to improve translation quality. Translation companies also wish to recruit university graduates who are familiar with translation technology. According to a survey conducted by Hao and Pym (2021) among graduates of a master's programme in the University of Melbourne, graduates who were employed as translators place technology-associated skills as the most needed skill in their employment.

As stated by Kenny (2020), translation technologies include machine translation (MT) and computer-aided translation (CAT), as well as localization tools used in the translation of software, websites, videogames and other digital products, and it can be "an umbrella term for a variety of tools and processes" (p. 499). Competency in making use of translation technologies to facilitate the translation process is defined as information literacy (IL).

Translation technology has become an indispensable component in the curriculum of translator training. More and more universities offer specialized courses on translation technology as part of the training of their students (Moorkens, 2018; Rico, 2017). More than half (55.9%) of the Chinese universities surveyed in the *2019 China Language Service Industry Developmen*t had offered translation technology-related courses to students (TAC, 2019).

Translation technology is relatively young, however, its integration into translator training is even younger (Kenny, 2020, pp. 499–500). There has been little systemic and in-depth research conducted on essential problems that need to be addressed, such as when translation technology should be introduced. Translation technology courses are often offered towards the end of an undergraduate programme or at the postgraduate level (Chan, 2010; Rothwell & Svoboda, 2019) because trainers believe that technology is difficult to learn and master. As Pym (2006) points out, technologies are believed as more complicated tools which are difficult to learn for undergraduates. If translation technology is introduced too early to students, it might have a negative impact on their translation learning.

In addition, the specialized courses offered in universities mainly focus on technology issues that seem to be completely separated from practical translation. In translation technology courses on CAT, for example, translation practice is usually not given due attention. Teachers are concerned with students' mastery of software, so they rarely pay attention to translation quality.

Lastly, IL, the competence to use technology, especially electronic tools and resources, to search for information and solve translation problems, is seldom touched upon in previous studies. Students generally have no idea how greater IL might help process text more effectively and efficiently. Pinto and Sales (2008b) point out that students tend to conduct online searches intuitively and believe a search engine like Google knows everything (p. 61).

The above observations serve as the starting point of our research—to investigate the impact of IL on students' translation in a beginner-level translation practice course as well as their perceptions of IL. In our research, the explanation from Collins online dictionary (2022) is adopted as the definition for "perception", which says "Your perception of something is the way that you think about it or the impression you have of it". Our research questions are as follows: What impact will IL produce on students' translation quality? What are students' perceptions of the use of electronic tools and resources, translation technology and IL competence in the process of translation? And can IL be introduced to translation trainees in a practice course at an earlier stage? IL, in our opinion, is a first step in developing students' awareness of technology's usefulness in translation and, therefore, deserves full attention. As pointed out by Massey and Ehrensberger-Dow (2011), the relative weight given to information literacy by translation practitioners, trainers and scholars needs to be supported by more research conducted on it (p. 194).

Literature Review

In this section, we first discuss the definition of IL to highlight the increasing attention it has attracted through years. Then how information literacy as a kind of competency (Sales & Pinto, 2011, p.247) is integrated into translator training is reviewed. This further leads us to understand why IL is contextualized in translator training.

Information Literacy and Translation Competence

Information literacy has been gaining

importance in academia since the 1960s (Pinto & Sales, 2007, p. 534). The president of the Information Industry Association, Paul Zurkowski (1974), describes information literates, or people with information literacy as trained to apply information resources to the work (p. 6). According to Zurkowski, people with information literacy have learned techniques and skills to make use of a wide range of tools to find information solutions to their problems. A current and expanded definition of IL was put forward by the Association of College and Research Libraries (2016), which describes IL as the set of integrated abilities which includes the reflective discovery of information, the understanding of how to produce and value information, and the use of information to create new knowledge and participate ethically in communities of learning.

In research conducted by different scholars, IL is discussed under other terms such as web searching skills (Raido, 2011), and information mining competence (European Master's in Translation [EMT] Board, 2017). Though expressions are different, the core is about searching for effective information and applying it to solve translation problems.

Based on the above definitions, we would like to describe IL in translation as the competency to discover, use and verify information to solve translation problems. By this definition, we argue that literacy means competency, as Sales and Pinto proposes so (2011, p.247). Students with a high translation IL level can use various kinds of translation technology, especially electronic tools and resources, to improve the efficiency and accuracy of their translations.

Recognizing the importance of IL, scholars incorporated this competency into translator training mechanism and made it a key component (Pym, 2003; Vienne, 2000). In their scholarly research the term IL may not be adopted, but the essence lies in the acknowledgment of the competence of using diversified information sources. For instance, the study conducted by the Process in the Acquisition of Translation Competence and Evaluation (PACTE) research group at the Universidad Autónoma de Barcelona emphasizes the instrumental sub-competence within the framework of translation competence (Hurtado Albir, 2001, pp. 394–408; Pinto & Sales, 2007, p. 420). Instrumental competence refers to knowledge and use of all kinds of information sources in professional practice (Hurtado Albir, 2001, p. 396; PACTE 2005, 2009).

Kelly (2002) puts forward a hier-

archical set of competencies such as communicative, cultural, psychophysiological, and professional instrumental. In her opinion, professional instrumental competence includes the use of all kinds of sources of documentary materials, the search for terminology and the management of glossaries and databases as well as the utilization of the software applications that are most frequently used in the professional practice of translating (pp. 14–15; see also Pinto, 2007).

In the Competence Framework of the European Master's in Translation project (EMT Board, 2017), students are supposed to be able to evaluate the relevance and reliability of information sources according to translation needs. In this project, information mining competence, the competence of searching useful information via varied resources, a different term for information literacy, is listed as one of the six professional competencies graduates should possess.

Similarly, scholars in China have examined the competencies of translators, among which technology competence is usually listed as one of the essentials. The ability to find, evaluate and process information is believed to help translators solve translation problems (Ma, 2016, p.77; Wang & Liu, 2021, p.87). Search Quotient (or Sou Shang in Chinese pinyin) is coined in the Chinese context to refer to IL (Wang & Wang, 2016).

Based on our survey, search skills such as techniques in using Google or Bing and electronic resources including online dictionaries and corpora are usually taught in the last year of an undergraduate translation programme or even at the master's level. At this stage, students are shown how to find information and use electronic resources to solve translation problems. Compared to the use of translation software such as Trados or MemoQ, which are much more complicated, such skills can be introduced to students earlier. We propose to incorporate translation technology competence into the teaching plan for a first-year translation course and then evaluate students work and survey their perceptions to probe the impacts of these actions on students' translation quality.

IL in Translator Training

Recognizing the importance of IL, empirical research has been carried out to study the integration of IL cultivation into translator training (Livberg & Mees, 2003; Massey & Ehrensberger-Dow, 2011; Pinto & Sales, 2007, 2008a, 2008b; Rodríguez-Inés, 2011; Varantola,

1998). Most of the studies focus on one or two information sources such as dictionaries or corpora. For instance, Rodríguez-Inés (2011) proposes an integrated approach to translation teaching emphasizing the adoption of electronic corpora and other related information and communication technology (ICT). Though he advocates integrating ICT tools into translator training, he does not explain the concept of ICT clearly. Instead, he focuses on several kinds of corpora that could be employed by translator trainees such as parallel corpora, bilingual comparable corpora, monolingual comparable corpora and ad hoc corpora.

Flórez and Alcina (2011) also take an ICT approach and discuss the adoption of free or open-source software in translator training. Acknowledging the necessity of integrating ICT tools in the curriculum to "foster technological literacy" (p. 326), their study centres on free/open-source software. There is not much about the impact of the software adoption on students' learning. Alcina et al. (2007) takes a holistic approach to help students to acquire translation technology skills by examining the difficulties that might arise at attitudinal, cognitive, and procedural levels within the context of an innovative education project. Such a holistic approach may unfold a full picture of how to utilize technology in translator training, but the work offers no discussion of specific technological skills or when to integrate technology.

Raido's (2011) research on how to develop web searching skills focuses on the development of online IL in translator training. She discusses in depth the important role played by web searching skills and argues that the focus should be shifted "from the acquisition of specialized knowledge in several domains to the development of information skills for problem solving" (p. 60). She emphasizes the need to carry out empirical studies and conducted one on a small cohort of postgraduate translation trainees in the first-year of their studies. Such empirical research could provide data to demonstrate the importance of cultivating IL. However, while her study on postgraduate translation trainees may serve as a reference for undergraduate translator training, it fails to provide first-hand data on undergraduate translator training.

The most systematic investigation of translation IL is conducted by Pinto and Sales (2007, 2008a, 2008b, 2013), who spend years carrying out a series of studies on information literacy (which they call INFOLIT) in translator training. They aim to gather data that could help them develop a framework for

implementing an information literacy programme that would meet the needs of translation and interpretation students (Pinto & Sales, 2008b, p. 48). They believe that by focusing on the information behaviour of real users, the research results can provide a basis for the improvement of information literacy instruction. Deeming it important to understand the views of students, translation trainers and professional translators and interpreters, they conduct a variety of surveys, interviews, case studies and so on to obtain data that can help to "close the gap that tends to exist between users" real needs in terms of information competence and the education inputs' (Pinto & Sales, 2008b, p. 48). Their targets are undergraduate students in Spain from the second, third and fourth years of the degree course in translation and interpretation. First-year students are excluded because they are beginners (Pinto & Sales, 2007, p. 10).

The very systematic, well-structured, and in-depth study conducted by Pinto and Sales (2007, 2008a, 2008b, 2013) reveals the landscape of IL in translator training in Spain, but the gaps can also be seen. The first one concerns the context. If similar research is conducted in a different context, for example, in China, will it yield similar conclusions? In addition, the target students in the above-mentioned research are in years two, three and four, what is the IL of first-year students? How about their perceptions on IL? Moreover, regarding one of our research questions which is "whether translation technology can be introduced to translation students at an earlier stage", their research provides no clue. Our research, in this case, is expected to fill in the gap.

Methodology

Design

This paper reports on a study conducted among first-year students. We focus on the teaching and learning of search skills as well as the use of electronic resources and their application in translation practice, aiming to develop students' information literacy. This research adopts both quantitative and qualitative methods. We intend to introduce IL skills and resources to students in a translation course and, from the data arising out of the process, to evaluate the effectiveness of the technology, tools and resources in improving students' translations. Students' responses to translation assignments and a survey were collected as data for analysis. The quantitative analysis of translation quality, qualitative description of translation errors and the

perceptions of students expressed in the survey all help to answer the research questions.

This research was conducted among students in an undergraduate programme on applied translation studies at a university based in mainland China. The course in which the IL was integrated is an introductory one designed for beginning translation students. It is a three-credit course required for the major in which instructors and students meet for three hours once per week for 14 weeks.

When it came to Week 10, after students had mastered some fundamental concepts, principles, and translation techniques, normally the courses would come to an end. At this point, we provided extensive readings materials, resourceful lectures and tutorials, and detailed Q & A sections on translation technology (especially on electronic resources and tools), a new module, to students.

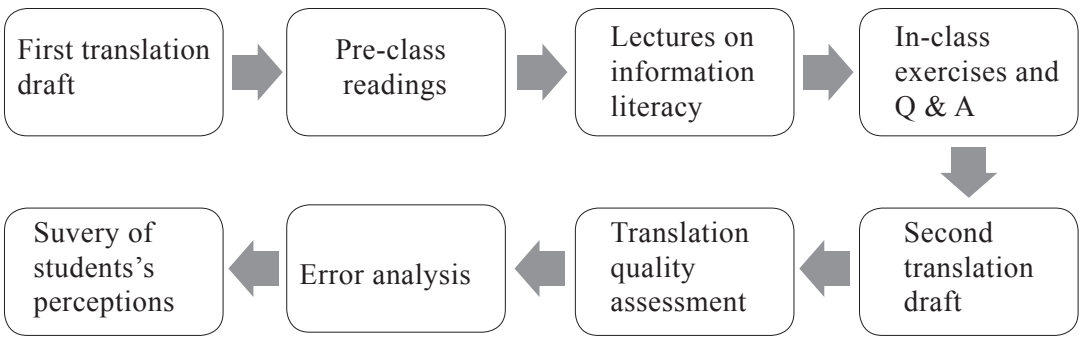
Figure 1 provides a detailed description of the research design. An assignment was given to students before two lectures on search skills and electronic resources. The responses were then collected before reading materials for the coming lectures were handed out.

Students attended lectures on translation technology, search skills and electronic tools in which examples were presented, and hands-on activities were arranged. A Q & A session was also provided to answer any questions or doubts that might arise. Students were afterwards given the opportunity to revise their translation assignments. They were instructed to adopt the technology learned in class to revise their translations.

Their first and second translations were compared on the basis of a translation

Figure 1

Flow Chart of Research Design



quality assessment. Words and phrases that are difficult to translate were identified and analysed. In addition, a survey was completed by the students to investigate their perceptions regarding translation technology and information literacy.

Participants

Altogether 32 first-year students participated in this research. Convenience sampling was adopted due to an authentic teaching environment. The researchers were teaching a class of 34 students in a fundamental translation course. The lectures on translation technology and IL, a new module, were scheduled as part of the teaching plan from the beginning of the course design. Two students failed to submit their assignments in time, so they were excluded from the research. The participants all meet the following descriptions:

- Chinese native speaker
- Advanced English learner who has been learning English since middle school for around 7 years.
- First-year student in an undergraduate translation programme where English is the language of instruction
- Beginning translation trainee who has not taken any other translator training before this course and who has achieved satisfactory results so far in this fundamental course
- Beginning translation trainee who has little knowledge of translation technology but has taken a basic course on fundamental computer skills

We argue that translation IL, such as knowledge of search skills and the use of electronic resources, can be introduced to students at the early stage of translator training to facilitate their competence development. Therefore, first-year students, with only basic training in translation and little experience with translation technology, were chosen as our participants.

Materials

Students were asked to translate a text before the lectures and then to revise their translations after the lectures. The task was a news translation from Chinse to English. Chinese to English was chosen because students might need more assistance to perform well translating into their second language, which traditionally is regarded as a more challenging task for beginners. The genre of news translation was selected because its features (such as idiomatic expressions, proper names, fixed combinations and synonyms) present difficulties that can be handled better with the aid of techno-

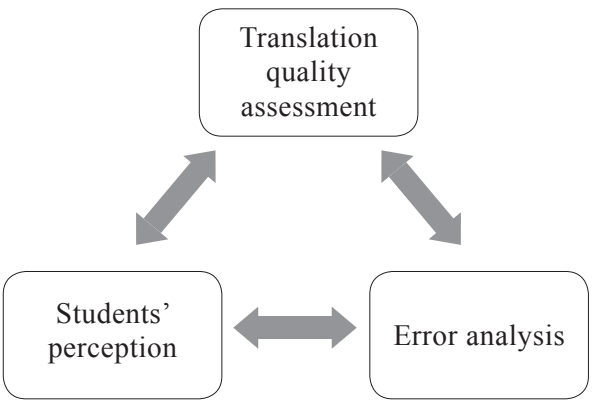
logical resources.

The Chinese text was edited by both researchers with some difficult words and phrases purposely included. The renderings of those words and phrases by students later might provide us insight into whether the technological skills and resources introduced in the study helped improve their translations.

Data Collection

As shown in Figure 2, methodological triangulation was implemented in the collection of research data, in the hope that data from different sources (such as the comparison of the scores in a quantitative manner, error analysis in a qualitative manner and the survey) could better consolidate the research findings and facilitate the discussion of results. The data to be collected in the research include students' first translation drafts before the lectures, second translation drafts after the lectures and the survey responses from students after the submissions of second translation drafts.

Figure 2
Triangulation of Data Collection



Translation Quality Assessment

Three evaluators were invited to grade the translations on a 100-point scale by reference to prepared rubrics. All three evaluators met the following criteria to minimize scoring differences: They possessed a bachelor's degree and a master's degree in translation studies; they had two to three years of work experience in translation programmes in higher education institutions; and they

had industrial experience with real-life translation tasks. In this way, we made sure that the three evaluators knew how translation is learned, taught and practised, which helped them to make more objective and professional judgement on students' translations.

To control expectancy effect, anonymity of the student participants was kept in the process of scoring. The three evaluators did not contact each other to discuss the scores. To control the expectations of the evaluators before the scoring, a briefing was conducted on students' learning progress and current levels of translation proficiency. In addition, a reference translation, the rubrics, and guidelines for grading were also provided. The evaluators gave a score to each translation draft. The scores of all the translations were calculated and compared.

Error Analysis

Some translation challenges were set up by the researchers in the source text, including proper names, synonyms, and idiomatic expressions. Some of those words or phrases are not supposed to be translated directly by the translators. Instead, the translators need to search for information online, and find and borrow some existing translations. Some other words or phrases used in the translations need to be double checked online to ascertain that they are accurately and appropriately used. Therefore, how those words or phrases are handled can be a good way to reflect students' information literacy.

Analysis of students' translations of those difficult words and phrases was conducted. The researchers, after observing students' translations, identified how those difficult words and phrases were handled in both drafts.

Survey

The student survey revealed students' perceptions of translation technology. The survey questions are attached in the appendix. To better understand the effect of IL, the survey was not anonymous. The names of the students were collected so the researchers could examine whether the linguistics and translation competency of an individual student might have an impact on the effectiveness of the IL intervention. But after the assessment of the translation quality, all students, regardless of their individual competences, displayed better performance in the translation assignment. Therefore, we decided it was no longer necessary to discuss individual situations.

The questions are divided mainly in three parts, regarding their perceptions over use of technology, especially

searches of electronic tools and resources, before the first draft, after the second draft, and in future tasks. There are totally 32 questions, most of which are semi-open and open questions such as "why do you think they should be introduced as early as possible?". The purpose is to elicit students to have an in-depth reflection on IL, to express their ideas fully and freely and to collect as much information as possible. All the participants did the survey immediately after they finished the second translation drafts. By doing so, the validity and reliability can be assured as the freshest memory could help students to provide the most authentic and personal perceptions on IL. Besides, another approach is to arrange a research assistant who did not participate in teaching to conduct the survey so that students would not be pressured to give certain answers. The researchers did not have access to the survey results until the end of the course. In addition, students were made aware of this arrangement so they knew their responses would not impact their assessment in the course.

Results and Discussion

Summary of Findings

We find that the overall translation quality improved from the first translation to the second. The discussion of the improvement from the perspectives of overall quality of the translations, error analysis and students' perceptions, which, as introduced before, form a methodological triangulation. In terms of the errors made, we find that fewer errors were made in Draft 2 on the one hand and, on the other hand, the translations in Draft 2 are more homogenized. We try to explore the reasons for these changes based on the data collected from the student survey.

Data Processing and Overall Translation Quality Assessment

First, statistical analysis was carried out to study the reliability of scorers, which is the basis for the following comparison and analysis.

The Intraclass Correlation Coefficient (ICC) in our study was obtained by a two-way random-effect model with three scorers across 32 participants. With reference to Cicchetti's guideline (1994), values between .6 and .74 indicate a good reliability, and values between .75 and 1 indicate excellent reliability. Concerning the scores of the first draft translations given by three scorers, the ICC value is .63 ($p < .001$), which indicate a good consistency among the scores. The ICC value for the second draft translations is

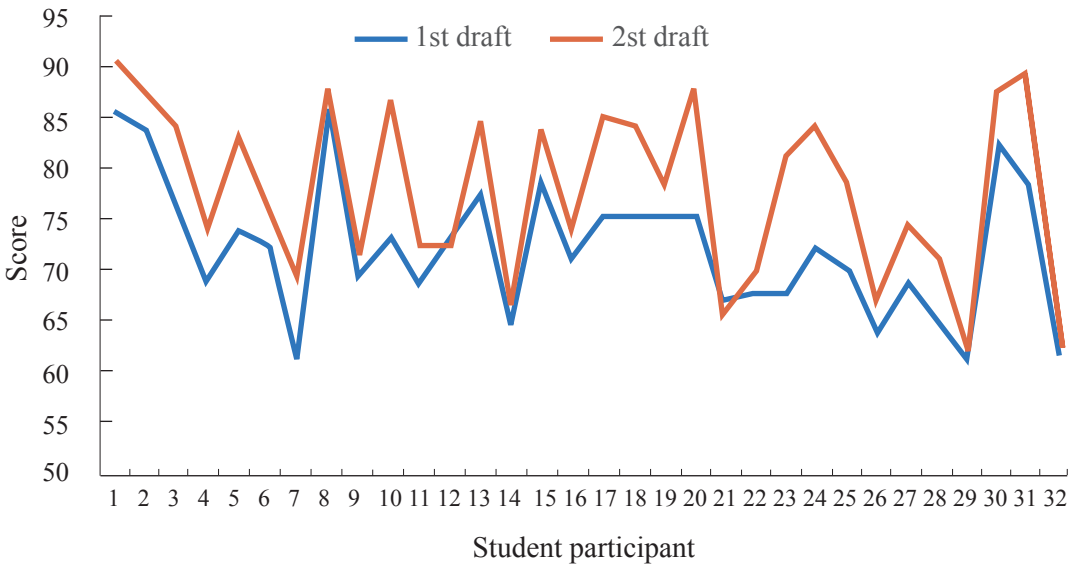
.89 ($p < .001$), which means an excellent consistency across the scores given by three scorers. Therefore, it would be appropriate to conclude the level of reliability is "good" to "excellent".

One thing we would like to point out is the ICC value for the first draft. Its value, compared with .89, an excellent consistency for the second draft, is relatively lower (a good consistency). It might be caused due to the uneven quality of the first draft, which brought trouble to three scorers in deciding the scores. For the second draft, however, with the help of IL, the translation quality has been improved and the translated texts, as mentioned previously, tend to be more homogenized.

The first draft scores and second draft scores were calculated by averaging the scores given by the three scorers. Figure 3 shows the scores of each student in the first and second translation drafts. The vertical axis indicates the number scores, while the horizontal axis represents the student participants. The average score across the class increases by 5.71 from the first to the second drafts.

Figure 3

Students' Scores for Draft 1 and Draft 2



An increase of nearly six points is considered significant as the correlation ecoefficiency and P-value indicate. Moreover, according to the conversion rules between numeral scores and letter grades adopted in the course, an increase of six points means an increase in letter grade. For instance, if students were given 84 in their first-draft translation, they would be at the level of B+. With an increase of 6 points in their second-draft translation, they would be given a score of 90, which is at the level of A-. Therefore, the statistics show a significant increase in the quality of students' translations.

Error Analysis

The text selected for translation is a short piece of news (see Figure 4). The two researchers discussed its difficulty and agreed that it was suitable for beginning students. As previously mentioned, the Chinese text was slightly edited by both researchers to make sure the translation IL skills introduced in class could be employed. The highlighted expressions are items that are easily mistranslated especially without turning to electronic resources and tools. These expressions are divided into three categories: idiomatic expressions, synonyms, and proper names. Some representative examples are discussed in

Figure 4

Source Text of the Translation Assignment

香港人，你最信任谁？

人与人之间的信任，绝对要经得起时间的考验，当一个人的行为和表现证明他**说到做到**，绝不只是做做**表面工夫**，人们才会**心悦诚服**地给予这个人**高评价**，表示「我信任你」。

那么，普遍香港人究竟最信任谁呢？

二零零九年底，**《读者文摘》**在亚太区多个**国家和地方**进行了一项**意见调查**，题目就是：「你最信任谁？」调查结果出现一些颇为有趣的现象，有些是**意料之内**，有些则是**出人意表**。此外，这项调查还要求**受访者**表达对四十个行业的信赖程度，逐一评分。结果平均分最高的是**消防员**，最低分的是**算命师**。

在香港的调查，我们提供了八十位来自不同界别的本地名人名单，要求受访者为这八十人逐一评分，表达对他们的信任度；同时亦请他们在八十人当中选择单独一位最信任的人，并写下原因。结果，以**萧芳芳**的平均分最高，名列第一；她同时也获最多受访者选为八十人之中最信任的人，成为这次调查的**「双料冠军」**。另一方面，政治人物的「成绩」，也给了我们一些启发。

the following section.

After collecting and analysing the data in the first drafts, it was observed that most of the expressions with red flags were wrongly or improperly translated. But we did not point out the problems to the students. We then gave lectures on translation technology and IL to students and asked them to translate the same passage for the second time. The purpose, as mentioned before, was to determine if the IL intervention would lead to better translations by the students.

To make sure that students had enough time to translate, reflect and digest the knowledge about IL, they were given a similar time span, seven days, for both rounds. After comparing Draft 1 and Draft 2, we noticed that most of the wrongly or improperly translated expressions in Draft 1 were corrected or refined. In other words, the translation results including the improved scores and qualities show a positive impact of IL of year-one translation trainees. The improved parts are mainly reflected from three aspects, which are idiomatic expression, synonyms, and proper names. They are discussed in detail one by one in the following part.

Idiomatic Expressions

Idiomatic expressions refer to conventional forms of communication. When the conventions are not followed, the expressions are not necessarily grammatically incorrect, but they are considered as poor diction or bad writing ("Idiomatic Expressions," n.d.). When translating from Chinese into English, it is expected that the English expressions are idiomatic and natural, following the language conventions of English. In the following tables, ST means source text, TT1 means expressions retrieved from Draft 1 and TT2 means expressions retrieved from Draft 2.

Table 1

Expressions Tend to Become More Idiomatic from TT1 to TT2

ST	TT1	TT2
说到做到	Do what they said	Walk the talk
意料之内	Some were expected	Came as no surprise
问卷调查	Opinion survey	Survey
香港人	Hong Konger / Hong Kongese / Hong Kong man / People in HK	Hong Kong people

Table 1 presents four examples. The first two “ 说到做到 ” (one does what he says) and “ 意料之内 ” (within the expectation) are conventional expressions in Chinese. Considering the genre of the text falls into the category of soft news, the style tends to be neutral to informal. As a result, idiomatic expressions following the language conventions of news reports are desired. For “ 说到做到 ”, TT1 is “do what they said”. Although the meaning is correct, the expression can only be regarded as an explanation of the ST instead of being idiomatic. In TT2, some students revised the explanation into an idiom “walk the talk”, which is more consistent with the language conventions of English speakers. In the second example, students also chose more idiomatic expressions in their second drafts.

In the third example, a nearly word-for-word translation was used by most students. “Opinion survey” is redundant, as surveys involve asking people questions about their opinions. “Opinion” is already included and indicated in “survey”. With the help of online resources, students became aware of this redundancy and improved their word choice to “survey” in the second draft.

“ 香港人 ” (Hong Kong people) is a different kind of example as “ 香 港 人 ” itself is not an idiom in Chinese. Instead, it is a conventional way to refer to people living in a certain place, usually the local citizen. The formula in Chinese is “place name + 人 (people)”, which means local citizens. The form of expression thus is relatively fixed. But due to the linguistic differences between Chinese and English, when translating such an item into English, students produced various versions as shown in the above table. They added “er” or “ese” at the end of Hong Kong, aiming to refer to the local citizens. In terms of grammar, the addition of these suffixes works, as there are New Yorkers and Cantonese. However, if students did not make use of translation technologies, some of them probably would not realize that “Hong Konger” or “Hong Kongese” are rarely seen in real use. “People in Hong Kong” is an incorrect translation of the ST, as people in Hong Kong are not necessarily local citizens. In comparison, TT2 is more adequate as it rendered the expression as “Hong Kong people”.

The examples illustrate the improved IL of students after being introduced to various online resources such as corpora and to advanced search skills. Our survey results also prove this point and are discussed in a later part of our paper.

Synonyms

A synonym is a word with the same or similar meaning as another word. When students need to choose from synonyms, their translation process is given below.

In table 2, the translation of the first example " 消防员 " is related to the understanding of the style of news and a sensitivity to gender issues. In Chinese, the literal meaning is "fire prevention people". In TT1, most students chose to use "fireman" or "firemen". However, if they go to online dictionaries, they will find the definition is "a person, usually a man, whose job is to put out fires" (Hornby, 2010). So, it is closely related to gender issues, which should have been avoided in a piece of news. Besides, "fireman" is relatively informal and more often used in colloquial language. After the IL lectures, around half of the students who used "fireman" revised it to "firefighter", which is more neutral and more suitable for news reports.

Another example " 受访者 " (people who get interviewed or surveyed) is related to the understanding of the context. In English, both "interviewee" and "respondent" can express a similar meaning of the ST " 受访者 "; however, a close examination of the online resources will show that the two are different since the former refers to a person being interviewed (usually face-to-face) while the latter usually refers to people answering questions in a survey. In TT2, around two-thirds of students changed "interviewees" to "respondents". When asked why they decided to do so, some of them explained that they used corpora to compare the collocation. Obviously, "respondent" more often appears together with "survey".

Proper Names

Only one person's name is involved in our exercise, which is " 萧芳芳 ", a well-known celebrity in Hong Kong. In Chinese-English translation, a common

Table 2

Choice Among Synonyms

ST	TT1	TT2
消防员	fireman / firemen	firefighter
受访者	interviewee	respondent

practice is to use pinyin when it comes to names. Most of the students probably did not even give a second thought before using Pinyin "XIAO Fangfang" to refer to this famous lady. Interestingly, after the lectures, they revised the pinyin "XIAO Fangfang" into "Josephine Siao". While it is different from the common practice in translating names, this revision is perfectly correct. As a Special Administrative Region of China, the culture in Hong Kong is very much different from that in the Chinese mainland. People in Hong Kong are more accustomed to English names. Besides, the pinyin system used in Hong Kong is different from that of Mainland China. In this context, "XIAO Fangfang" makes no sense to either Hong Kong people or overseas readers since Josephine Siao is accepted and well known. The revision shows that students made intentional searches for the name of " 萧芳芳 " after the appropriate technologies were introduced to them.

Students' Perceptions of IL

After the translation exercises and lectures, we conducted a survey, which has been described in the methodology part, to learn about students' perceptions of IL. The feedback is quite positive, with 57.58% strongly agreeing, and the remaining 42.42% agreeing, that IL cultivation is useful and helpful. In this regard, no one had a doubt about the value of developing their IL competence. This finding is of great significance, as most previous studies on IL mainly target postgraduate students (Raido, 2011), or year three or year four undergraduate students (Pinto & Sales, 2007). The perceptions acquired from the data of our survey show that year-one translation students in the Chinese context hold proactive attitudes towards IL.

When asked about what translation technology tools were used in their first draft, most of them mentioned Baidu, the most popular search engine in China, and explained that they just did simple keyword searches with it. For e-dictionaries, the majority of them used Youdao, the one having the largest market share in China. It is just like what Pinto and Sales (2008b, p. 61)pointed out, students tend to conduct online searches intuitively and believe a search engine knows everything. After the IL lectures, students mentioned that they used corpora, various e-dictionaries which can help them understand more about synonyms, antonyms, and the professional meanings of a word. In addition, they also learned how to use advanced search syntax in search engines to arrive at more relevant

information. The skills mastered by students could be regarded as the competency defined in the previous discussion, which is to discover, use and verify information to solve translation problems. In other words, they have acquired IL to a certain extent.

According to our survey, most students believed that their translation quality had improved. Based on the results of quality assessment and error analysis, the quality indeed has been improved to a certain extent. At least two-thirds of the students believed they had made progress in terms of their grammar, expressions, and accuracy of terms. But when asked if IL could help them to improve translation efficiency, only a few students confirmed. In our opinion, this result has something to do with students' unfamiliarity with the translation tools. And the unfamiliarity may be due to the course design. As mentioned above, most translation technology courses are offered towards the end of an undergraduate programme or at the postgraduate level (Chan, 2010; Rothwell & Svoboda, 2019). For the research conducted to study IL, the target students were generally in years two to four. When it has become almost a kind of convention not to teach first-year students IL-related knowledge, our first-year students had never been introduced to it either. We believe that explains unfamiliarity. But since two-thirds students confirmed that they had made progress in different aspects, we argue that an earlier introduction of IL to first-year students is possible.

Students, though being willing to use technology in future translation tasks, expressed that they were still not confident when handling such technologies. One reason might be that technology is difficult to master for some of them. Around half of the students surveyed mentioned that they found it not easy to apply the skills and resources in actual translation tasks. Their comments may in a sense echo what Pym (2006) sees that technologies are believed to be more complicated tools that are difficult to learn for undergraduates. However, regardless of the difficulty of mastering technology, most students still believe that translation technology should be introduced to students at an early stage.

Conclusion

We conclude that search skills and electronic translation resources could be introduced earlier to students, which will have a positive impact on their translation quality. However, two issues

should be carefully handled. First, more time should be spent on the teaching and demonstration, as students might find technology difficult, or might need time to digest the information. Teachers should also be innovative and creative in teaching methods, in order that the content is made easier for students to learn. Second, according to the error analysis, students should be warned not to over-rely on technology. They should have the ability to critically evaluate the results found with the assistance of these skills and resources.

In the next phase of the study, a second cycle of the research is to be implemented with more data collected. The teaching of the skills and use of the resources will be finetuned based on feedback from students. We believe that more data will help us understand better the role of information literacy in translator training.

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Appendix

Survey on Students' Perception Over Use of Electronic Tools and Resources

1. Your name:
2. Your gender:
3. How much time have you spent on the first draft of the assignment?
4. How much time have you spent on the second draft of the assignment?
5. Before the lectures, have you ever used any electronic resources and tools, such as e-dictionary or search engine, to assist your translation assignments?
6. When you finished the first draft of your assignment, did you use any electronic resources and tools?
7. What electronic resources have you used in the first draft?
8. How did you use those resources, and what translation difficulties are solved by using those resources?
9. Why didn't you use any electronic resources?
10. Did you encounter any translation difficulties in the translation process? How did you overcome them without using any electronic resources?
11. Did you use the search skills and electronic resources introduced in class in the second draft of the assignment?
12. Why didn't you use them?
13. What forms of search skills and electronic resources did you use?
14. How do you agree with the following statement: The search skills and electronic resources introduced in class help you to solve translation problems in your translation process?
15. Why do you think they are not helpful?
16. Why do you think they are helpful? What translation problems and difficulties are solved? Can you describe?
17. Do you agree with the following statement: Search skill and electronic resources are easy to learn and master.
18. Why do you think it is easy / difficult to learn?
19. Do you agree with the following statement: the search skills and electronic resources should be introduced to translation students as early as possible.
20. Why don't you agree? And when do you think they should be introduced to students?

21. Why do you think they should be introduced as early as possible?
22. Do you think the translation quality of the second draft is better than that of the first draft?
23. Do you agree with the following statement: the search skills and electronic resources contribute to the improvement of the translation quality of the second draft.
24. Why do you think they are not helping with the improvement of translation quality?
25. Why do you think they help with the improvement of translation quality?
26. What else, in addition to search skills and electronic resources, do you think has contributed to the improvement of your translation quality?
27. Do you agree with the following statement: I feel more confident with my translation after the lectures on search skills and electronic resources.
28. Why do you or don't you feel more confident?
29. Do you think the search skills and electronic resources negatively influenced your translation process? Say, your creativity has been undermined?
30. Do you agree with the following statement: I am going to use those skills and resources in my future translation practice?
31. Why do you think you are going / not going to use them?
32. Is there any other comments or thoughts that you would like to share with us?

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