



# Terminology management and translation teaching in Mainland China

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## ABSTRACT

**In the information age, professional translators are supposed to use various translation tools such as terminology management software to meet the demands of the translator training market. Based on an analysis of literatures from the years 2000–2010 obtained from the Chinese National Knowledge Infrastructure (CNKI), how terminology management is incorporated into professional translation teaching in mainland China was surveyed. In this study, several practical and effective measures are proposed to address the problems revealed by the literature analysis. Furthermore, it is suggested that the focus be shifted from the traditional translation teaching model to a new professional translation teaching model, which encompasses terminology management and other translation technologies.**

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## INTRODUCTION

As translology has established itself in the 21<sup>st</sup> century as an academic discipline, increasing numbers of researchers are assigning greater importance to translation research and practices, thus contributing significantly to the theoretical construction of translation studies. Simultaneously, due to economic, technological and cultural developments, translation as an industry is in increasing demand. Accordingly, translation tools and resources continue to evolve, and the perspectives of translation research are constantly being broadened. Since the 1990s, computer-aided translation tools such as terminology management software has been developed rapidly based on the needs of professional translators. Some of translation and localization management tools are JPO[, Across Language Server, AIT Projotex, Alchemy Language Exchange, Beetext Flow, CrossGapFastBiz, Elanex Online, and GlobalLink GMS (Wang and Wang, 2015: 281-282). Thus, how can the translator training process be better targeted by the translation market? In other words, how can a professional translator training system be designed to

meet the everyday needs of professionals dealing with the terminological problems in a variety of fields? To adequately address each of these issues, we have surveyed terminology management as integrated into professional translation teaching on the basis of the literatures between 2000 and 2010 from the online database of the Chinese National Knowledge Infrastructure (CNKI), and then several practical and effective measures herein are proposed to address the problems revealed by the literature analysis. Furthermore, we encourage people to shift their focus from the traditional translation teaching model to a new professional translation teaching model, which encompasses terminology management and other translation technologies.

## TERMINOLOGY MANAGEMENT AND TRANSLATION

With the rapid development of modern society, new industries and thus new terms have come into being. These changes, in turn, have created new requirements for professional translators. In fact, a larger proportion of professional translation is of technical translation in special fields such as information technology,

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manufacturing technology and biotechnology. Because translators might not be experts in all of these fields, some of the terms to be translated pose problems, particularly in highly technical translation. However, this problem can be resolved effectively by using translation technologies such as terminology management software.

### Terminology management

According to Quah (2008: 6), the terms commonly used to describe translation tools in translation technology are as follows: machine translation (MT), machine-aided/assisted human translation (MAHT), human-aided/assisted machine translation (HAMT), computer-aided/assisted translation (CAT), machine-aided/assisted translation (MAT) and fully automatic high-quality (machine) translation (FAHQT/FAHQMT). Among these tools, machine translation and computer-aided translation are frequently discussed and studied in mainland China. Both scholars and translators emphasize the important role technology plays in the translation process in the age of information. Thus, it is useful for professional translators to know more about translation tools and resources, and many professional translators of specialized texts can benefit from use of terminology management techniques.

Terminology is an important field to study, and most professional translators who are involved in technical translation know that terminology is crucial to their translation practices and studies. However, it is unrealistic for a translator to become an expert in various specialized fields. In this respect, the search for correct terminology can become very important and time-consuming. According to the studies performed by Arntz and Picht in 1989, the search for terminology (or "terminology mining") can take up to 75 percent of a translator's time (Arntz and Picht, 1989: 234). Terminology management enables translators to use their time more efficiently by allowing them to set up a database in which they can gather all of the terminology that they come across throughout their translation career.

Terminology management is a generic term for the documentation, storage, manipulation and presentation of a specialized vocabulary. The terminology covered is usually that of a given discipline or sub-discipline or the terms needed for a specific translation project. Because of the amount of terminology to be managed and the need to provide fast and easy access to the stored data, terminology management is greatly assisted by information and communication technology (Austermühl, 2001: 102). To gather terminological data, terminologists and translators can use many methods to organize the terms of a specific discipline. At least two clear trends in terminology research have emerged in the last twenty years: one trend is to move from the traditional theory of

terminology to diversified theories of terminology and another trend from the traditional method to a computerized network terminology management mode (Liang, 2006: 55). As a result, forms of terminology management have changed as well, from the methods of file cards, lists in word-processors, spreadsheets, database management systems, terminology management systems to the method of hypermedia systems (Austermühl, 2001: 103). The last four computer-aided methods are popular among translation professionals and translation agencies. And the latest research achievement on terminology is perhaps the *Handbook of Terminology: Volume 1* (Kockaert and Steurs, 2015) which can definitely shed light on terminology management research.

Usually, most professional translators prefer to use computer-aided terminology management software without making great effort to learn how to use a tool, which would divert them from their main priority, namely translating. Therefore, a tool such as terminology management software helps professional translators to record and integrate terminology into their translation work. In one form of terminology management, a typical terminology management system consists of tools that structure the database according to the need; a database, once populated, is known as a "termbase" (Wright and Budin, 1997, 2001). The main functions of a terminology management system are to maintain a database, manipulate terminology resources, identify multiple equivalents, establish terminological resources for dictionaries and glossaries, and exchange terms efficiently (Galinski and Budin, 1997: 397).

A terminology database can be built de novo and managed during the ongoing translation work. Additional information such as definitions, context, gender and synonyms can also be included. Most terminology management systems allow the user to define and structure the information categories required for their work. Furthermore, terms for specific subject fields and languages can be accessed by a translator via compact discs or online term banks. The database and look-up features are integrated in some terminology management systems, while in others they are kept separate. Professional translators may prefer to use an integrated system that enables them to compile a terminology database, while translating with a translation memory system (Quah, 2008: 106). The issues of terminology management in translation will be addressed below.

### Implications of terminology management for translation

Terminology management has its own strengths in improvement of the quality and efficiency in translation and localization. Therefore, it is necessary to help

translation trainers and trainees familiarize themselves with terminology management technology.

### ***Improvement of translation quality and efficiency***

With the aid of terminology management, the terminology of a specific discipline can be standardized to maintain translation accuracy, consistency and standardisation, thereby improving translation quality and efficiency. In one form of computer-aided terminology management, the terminology management system frequently used in mainland China is the main content of the term library. The so-called term library is a large collection of records of electronic terms. These terms are similar to the dictionary entries recorded, including the conceptual information for each term and its representatives. A bilingual or multilingual glossary is also included for translators. Professional document translators regulate the terms with the help of a glossary in the process of translating. In this way, no matter how many translators are involved in a translation project, the consistency of the terminology throughout the document can be ensured. Obviously, the term library is an important translation resource.

Technical translation inevitably involves many different terms from specific fields. If the consistency of the terminology within the same specific field cannot be guaranteed, the accuracy and reliability of translation will inevitably be reduced. For example, in mainland China, the word “software” is generally translated as “*ruanjian* (软件)”, but in Taiwan and other places in China, the same term is translated as “*ruanti* (软体)”. If a term is translated in different ways in different translations, the consistency of translation information and terminology specification will not be assured, and target readers may be misled. Therefore, the issues of terminology management in translation will be addressed below. The premise of accurate translation is to maintain the consistency of terminology and thus improve translation quality.

A major task of computer-aided translation is to maintain a consistent terminology in translation. Terminology management systems help accomplish this task. Simply stated, a terminology management system manages the system of terms. Its function is to maintain databases, interface with various term resources and identify the units and effectively establish term resources for dictionaries and glossaries and exchange terminology. In computer-assisted translation, a terminology management system is mainly used to store, retrieve and update the terminology database, providing translators with a complete specification of terms to ensure a consistent terminology in translation and improve translation quality. Specifically, terminology management products standardize terminology through a management

tool. Users only need to establish one or more standard list(s) of terms. When translators use a terminology management system when they translate, they first open the corresponding list of terms of terminology management tools, and then the system will automatically recognize which words are defined terms in the current sentence and give the standard translation of terminology. Thus, the term management system helps a professional translator record terms and insert them into a translated work.

Before beginning a translation, translators can use a computer-aided terminology management system to search for candidate terms and conduct terminology extraction. Extraction and searching for candidate terms provide aids in deciding which candidate terms should be included in the terminology database. After the relevant terms in the source language have been determined, searching among these terms aims to determine the appropriate terms in the target language to represent the concept most accurately. Term searching can use a variety of language resources such as Internet resources and terminology databases.

In the translation process, an automatic term query can be enabled with the aid of a computer-aided terminology management system. Automatic term querying is actually a machine translation of terminology at the term level. For example, in an English-Chinese machine translation, when the terms “flowchart” and “flow diagram” appear as two synonymous terms in the source language, the computer can automatically translate them both into “流程图” (*liuchengtu*) in the target language without the need for manual translation by the translator.

After a translation is completed, a computer-aided terminology management system can be used to check for terminology consistency and unqualified terminology and prepare the verification procedure to determine consistent terminology. For example, if the system translates “thermocline” into “温跃层” (*wen yueceng*), whereas the translator manually translates it as “温变层” (*wen bianceng*), the verification procedure will automatically correct it as “温变层” to maintain the terminology consistency.

Furthermore, unqualified terms should be flagged to attract the translator’s attention. If translators master these advanced translation tools, they can enhance their translation efficiency and meet the needs of translation in the information age. Translation practice has shown that terminology management can reduce translators’ mental and manual workload and improve their efficiency. Because the exchange of information is continually occurring in modern society, full use of electronic translation tools such as terminology management enables translators to obtain more information and perform more translation tasks in the shortest possible time.

### ***From translation to localization***

In the information age, digital information has promoted translation technologies from the periphery to the centre of the translation industry. Furthermore, due to the introduction and wide use of translation technologies, there exists intense competition among translation companies seeking ways to broaden the scope of their business operations. It is these translation technologies that are changing the notion of translation into localization.

In localization, there is a stronger emphasis placed on translation tools and technology in comparison to the traditional translation industry. Translation technology is closely related to the profits of translation companies, also known as localization companies. To maintain their profits, these translation companies must compete for the use of the cutting-edge translation technology, thus increasing the visibility and importance of translation technology. By simply using computer-aided terminology management software, many multinational companies engage in localization to effectively establish and manage economic terms, eliminate unproductive time and reduce costs associated with the correction of term errors, ensuring that all employees can use the relevant terminology accurately and consistently in the life cycle of the products and services. Although traditional language knowledge and translation skills form the core of the original language and target language, it is an indisputable fact that translators are increasingly dependent on translation technology. Computer-aided terminology management software is widely used by translators in localization.

### **TERMINOLOGY MANAGEMENT IN TRANSLATION TEACHING IN MAINLAND CHINA**

As the society develops an increasingly high degree of information technology, information and network technology is becoming more important in translation practices, translation studies and translation teaching. In the advancement of translation technology from the periphery to the centre of translation practices, research, and teaching, two factors are at work: digital information and the translation market. As the influence of these two factors is getting stronger in mainland China, translation teaching becomes increasingly dependent on translation technologies such as terminology management software. The sustained development of mainland China's translation market is inseparable from systematic translation teaching. Emphasis is increasingly placed on translation technology at many universities in mainland China. As part of the translation teaching system, the teaching of terminology management will be explored in detail in the following sections.

### **The current situation**

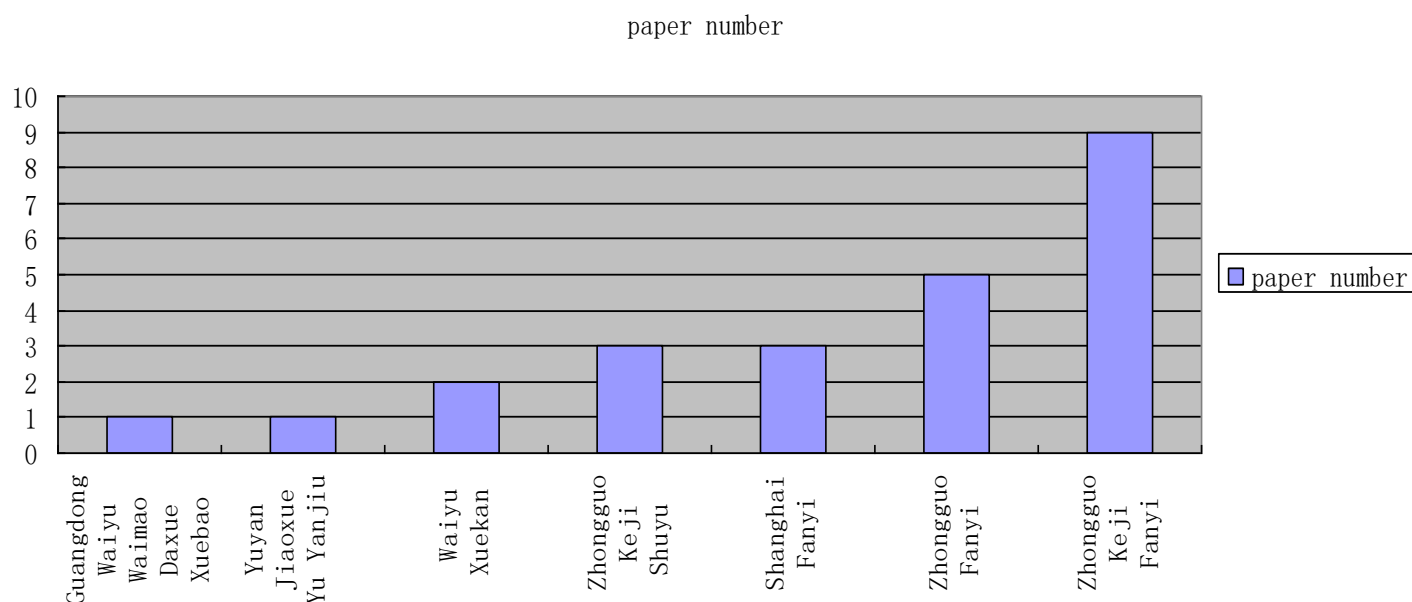
So far many domestic researchers have explored the teaching of translation technology in professional translator training with respect to curriculum design.

### ***Curriculum design***

From the viewpoint of translation education, many university departments and research centres in Europe and the United States have developed numerous translation technology courses to train graduate students. In recent years, universities in Hong Kong and Taiwan have placed an increasing emphasis on translation technology. For example, the Chinese University of Hong Kong has developed a doctoral studies program in translation technology.

In contrast with these developments, the teaching of translation technology in mainland China is still relatively immature. Even now, some educational institutions in mainland China pay little attention to instruction in the use of translation technology such as terminology management software. An examination of translation technology courses at several foreign universities indicates that, after years of development and elaboration, more sound systems and effective methods in machine translation, terminology management, translation and technical training curricula, training models and translation testing have been implemented at these colleges and universities. Several universities in mainland China are currently developing translation technology courses such as the one taught at Nanjing University by Professor Ke Ping, which is titled "Language, Translation, and Technology". Although some Chinese universities have provided translation technology courses, they still face difficulties, including a shortage of teachers and insufficient capital investment. Professor Ke Ping's course shows that more universities in mainland China are offering translation technology courses and, therefore, more students are receiving training in translation technology.

In mainland China, machine translation and translation technology teaching are not alien concepts. Furthermore, the gradual establishment of translatology as a discipline and the increasing presence of up-to-date machine translation and translation technologies have helped to deepen the general understanding of this issue in recent years. One of the earliest institutions studying machine translation instruction is Hebei Normal University, which has tried continually to develop its curriculum, training mode and skills of its postgraduates. As a result, the effectiveness of the training in Hebei Normal University has proven to be significant. Recently, the Institute of Software and Microelectronics of Peking University and the Peking University Institute of Linguistics co-founded



**Figure 1.** Statistics of papers by journals.

the Language Information Engineering Department, the first in mainland China to offer a Master's degree in the engineering program in the field of language information processing technology. The department focuses on professional language information processing capabilities to cultivate translators under the direction of teacher-based computer-aided translation. The program primarily trains students with proficient bilingual ability as a communication tool, strengthens their vocational skills as a translator, and familiarizes them with machine-aided translation theory. Thus, students are able to master language proficiency in information processing as related to applied technology and tools. With more universities in mainland China offering translation and interpretation as a major, there is an increased awareness that establishing a scientific system in translation technology training plays an important role in translation teaching, gradually forming a mutually beneficial relationship between them.

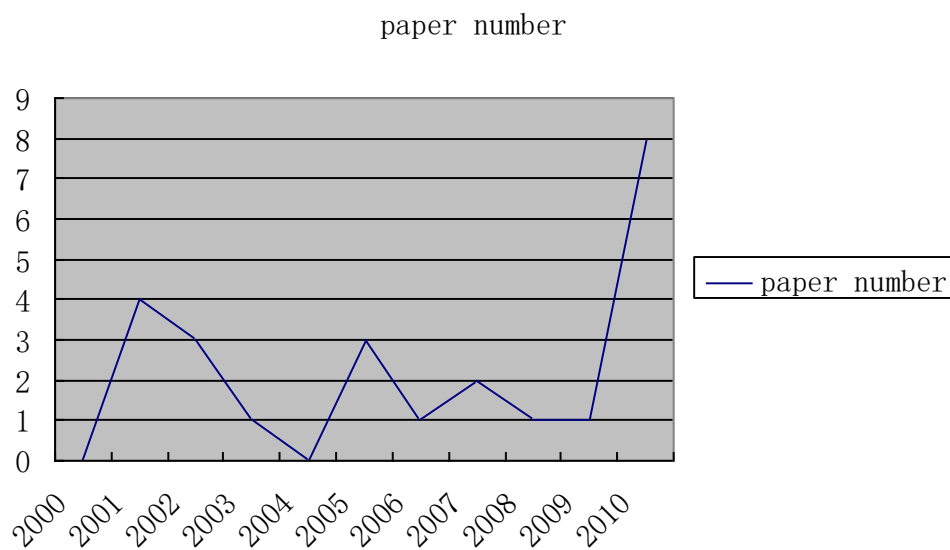
### Literature review

To understand terminology management and its development more clearly, we retrieved and collected the literatures from “中国知” (Chinese National Knowledge Infrastructure, CNKI) and based a detailed analysis on a number of related papers published, their publication dates, the journals in which they were published, and theses completed. In this study, terminology management is evaluated in the context of translation teaching; therefore, the investigated research journals were targeted among the core foreign language journals

published in mainland China. After browsing these journals, we found that, from 2000 to 2010, there were 449 papers on translation technology, 162 on translation tools, 64 on terminology management and 52 on terminology management systems.

Taking into account the rapid development of the Internet and the continuously improving performance characteristics of computer hardware and software, we selected only related papers published in the core foreign language journals, including “《外语学刊》” (*Foreign Language Research*), “《中国科技术语》” (*China Terminology*), “《中国科技翻译》” (*Chinese Science and Technology Translators Journal*), “《中国翻译》” (*Chinese Translators Journal*), “《广东外语外贸大学学报》” (*Journal of Guangdong University of Foreign Studies*), “《语言教学与研究》” (*Language Teaching and Linguistic Studies*), and “《上海翻译》” (*Shanghai Journal of Translators for Science and Technology*) during the years from 2000 to 2010 both as the object of study and as the basis for predicting future trends. The investigation indicates that, in this period, there were 24 relevant publications in total. The four journals with the greatest number of publications were *Chinese Science and Technology Translators Journal*, *Chinese Translators Journal*, *Shanghai Journal of Translators for Science and Technology* and *China Terminology*, with 9, 5, 3 and 3 papers published, respectively. The findings are illustrated in Figure 1.

Among the above mentioned journals, *Chinese Science and Technology Translators Journal* gave this topic the most concentrated attention and the most representation;



**Figure 2.** Statistics of papers by year.

overall, however, research in this area seemed insufficient (with a total of only 24 papers) and fragmented. This observation can be attributed to two factors: first, translatology as an independent discipline in mainland China is still in its infancy of development; in addition, the establishment of translation majors for professional undergraduate and postgraduate degrees in mainland China started in 2006 and 2007. On June 29, 2006, as approved by the state Ministry of Education, Fudan University, Guangdong University of Foreign Studies and Hebei Normal University were the first universities to enrol undergraduate students majoring in translation and interpretation. At the Beijing Foreign Studies University, the English Language Institute also established the Department of Translation to train professional translators. At the 23rd meeting held by the Academic Degrees Committee of the State Council in January, 2007, the program of “Translation Master” (Master of Translation and Interpreting, MTI) was unanimously adopted. Meanwhile, the teaching of translation technology and translation teaching are like two parallel lines in that they are difficult to be integrated into one and the same. Research and development in translation technologies, including terminology management, involves interdisciplinary knowledge. However, the curriculum at China’s universities separates the liberal arts from the sciences, giving rise to a situation in which liberal arts students as translation learners struggle with scientific technology such as computer software. Although the survey of CNKI showed that 449 papers on translation technology were published in the years 2000–2010, the number of articles published in core language journals was limited. To investigate the development of

translatology in this period, we analyzed the specifics according to the time in which the papers were published (Figure 2).

According to Figure 2, the number of papers published in the core foreign language journals over the past 11 years shows no clear trend. For example, there was only one paper published each year in 2003, 2006, 2008, and 2009, three papers in 2002 and 2005, two papers in 2007, and four in 2001. Notably, there were no papers published in 2000 and 2004. In 2010, the number of papers rose to a total of eight. In fact, 2001 and 2010 are the two years when the largest number of papers was published.

Let us take *Chinese Science and Technology Translators Journal*, for example. The papers published in this journal in 2001 and 2002 are concerned with the functions of translation software in the practice of translation such as the use of Trados in the localization services. The two papers published in 2005 are related to teaching translation technology in translator training. The 2007 papers focus on the information age and the relationship between machine translation and human translation. The concepts and classification of translation technology were discussed with in-depth insights in 2008. In 2010, the paper published explored the relationship between translation and technology. Based on this small number of papers, we have observed a trend in which the topics of the papers shift from the function of translation technology in translation practice to translation technology teaching and subsequently to the theoretical discussion of translation technology.

In the survey, we have also found that relatively few papers (29%) combine translation technology/terminology

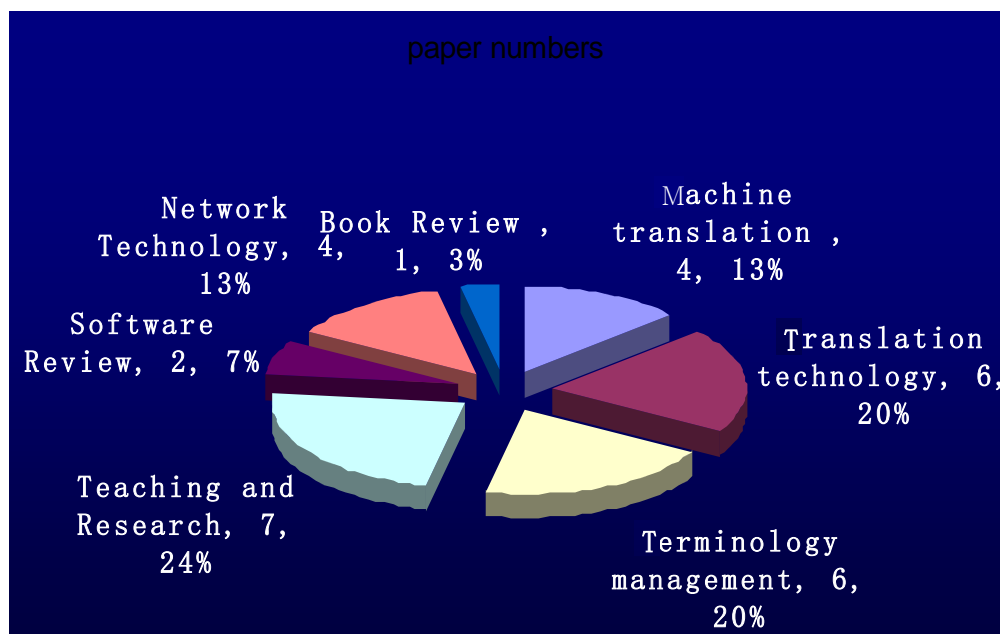


Figure 3. Papers distribution overview.

management with translator training. Another characteristic is that the development and research of machine translation and translation software flourished in recent years. However, translation teaching aimed at training professional translators pays insufficient attention to translation technology.

Why is there such a contrast? What is the area that has the greatest impact on students' vocational orientation in translation teaching, especially at the postgraduate level? Are the training objectives clear? Is an understanding of the translation market secure? We believe that addressing these issues will facilitate the healthy development of the discipline; clear thinking will help reduce unnecessary exploration, allowing for further positive growth. To provide a relatively intuitive understanding of the situation over the past 11 years, we have created a figure which is related to "machine translation," "terminology management," "teaching and research," "software review," "network technology" and "book review" (Figure 3).

Based on the above numbers (using a total of 30 samples; six are coincident data), we can clearly see that in the past 11 years, all of the relevant papers published are in a more balanced distribution. Most of the papers (seven, 24% of the total) are related to teaching and research followed by translation technology (6, 20% of the total) and terminology management (6, 20% of the total). There are only eight papers (26%) on machine translation and network technology and three on software and book reviews (10%). The investment in teaching and research almost meets the requirements of the

development of the market. This shows that the present social environment and the target of translator training at universities are in agreement with each other.

As Wang (2004) stated, "Since the corpus and the network develop very fast, our translator training will inevitably need to use new tools and techniques. The first step forward, occupying the forefront, is to be able to access innovative resources". Thus, the teaching of translation technologies such as terminology management must be adapted to the current trends of information technology and networking.

### Reform of the current translator training system

Since the reform and opening up was carried out three decades ago, China has made remarkable achievements in the translation industry, and it has become one of the powers in the field of translation in the world. However, the country's overall translation level is not high, due to a serious lack of translation professionals and high-quality translators. China's translation market situation and the needs of economic and cultural exchange in the new era pose a severe challenge to translator training. At present, Beijing Foreign Studies University, Shanghai International Studies University, Guangdong University of Foreign Studies and others have established programs in translation and interpretation. In addition, China's first doctoral program in translation studies was established at Shanghai International Studies University which began to recruit doctoral students in translation studies in 2005. All



of these universities as the training base are providing translation teaching programs with a continuous supply of translation professionals at different skill levels.

In the evolution and transformation of translation and its environment, translation technology has played an important role, and, as a profession, translation cannot be easily separated from translation technology. From the traditional pen and paper method to organizing a special translation workshop or the use of translation aids, translators increasingly use translation technologies and translation tools such as terminology management software. Today, more universities and training institutions emphasize MTI and undergraduate translation education with a strategy based on market positioning and integration with the needs of the translation industry.

Similarly, in the face of an increasingly fierce competitive environment, translation companies and organizations are actively using advanced translation technologies and a variety of translation tools to survive and develop. Clearly, existing practitioners and translation agencies must attach great importance to translator training and keep a close eye on the development of translation technology and translation tools. Of course, translation training institutions should make a scientific, systematic analysis of the current market characteristics and market demands before making plans for translator training. If an analysis of teaching needs is well executed, then training objectives, personnel specifications, curricula, teaching requirements, teaching materials, teaching methods and means, and test and evaluation methods will have a scientific description and reflect the society's current and future demands for translation talents and the developmental needs of individual students. Furthermore, the developmental needs of individual students must be based on the requirements of the translation market. In other words, the translation education should enable students to learn in school and prepare them to succeed once they are out of school. They must be able to adapt themselves quickly to the language service market because there is a great demand for translators in the localization industry. Graduate students cannot rely on receiving training in their company or learning relevant new technologies by self-study in their spare time. In other words, we should turn to professional and technical translator training. With the use of translation technology, more professional translators can be trained to better serve the translation market.

### **Problems and barriers**

In professional translation teaching, terminology management and other translation technology courses are designed to introduce students to a basic knowledge of translation technology, information network, the

application of language information tools, and the use of translation tools, thereby enabling students to use searching and other technology applications. Professional translators must develop searching skills to obtain basic reference resources for high-quality and reliable translation. Of course, mainland China is still facing several difficulties in establishing terminology management and other translation technology courses.

### ***Problems with the traditional translation teaching model***

In mainland China, some translator training courses focus on students' language skills; teachers explain the practical translation skills, and students practice them. In this teaching process, the dependence on translation technology is small, and most translation courses are conducted in the classroom. There are advantages for traditional teaching methods, and a number of translators are trained in this manner. However, with the frequent exchanges and updated knowledge in today's information-driven society, translators need the ability to obtain information easily, which is a capability that cannot be cultivated by looking terms up in the dictionary and doing more practice exercises.

Several Chinese universities with undergraduate translation programs have already initiated translation technology programs. However, there are still many universities maintaining the traditional translation teaching model; in fact, in many of these universities, translation technology is not yet a professional core course. In countries such as Canada where translation teaching is relatively mature, translation technology courses constitute a significant part of the required courses. For example, at the Ottawa campuses of the University of Quebec, four such courses are available, including language information tools, documentation and technical terms, terminology and information terminology, and advanced language information tools. Furthermore, in the curriculum of Laval University, translation technology courses comprise 18.75% of the total percentage of compulsory credits, illustrating the importance of translation technology. To meet the needs of an information-driven society, mainland China must innovate upon traditional translation teaching to promote translation technology teaching.

### ***Difficulties in recruiting teachers***

Faculty shortage is a critical limiting factor in the creation of translation technology courses. Some teachers teaching undergraduate translation and interpretation courses have little practical experience in translation and interpretation with a poor understanding of translation



technology. Teachers teaching computer-aided translation and translation technology must be familiar with the principles, operation, and industry requirements of computer-aided translation. They need to be familiar with the use and maintenance of translation technology and translation tools and grasp the latest international developments and research so that they can acquire strong technical skills and broaden their academic horizons. However, in addition to a heavy teaching workload, translation teachers often have their own research projects, as well as several internal and external translation tasks, leaving them with limited time to solve related problems. Thus, some translation teachers lack software knowledge (He, 1996: 41).

The key point is that over the past several decades, China has trained many professional translation teachers whose work is oriented toward foreign language education, and there exists a phenomenon that students learning liberal arts well will learn science badly. In addition, liberal arts students are often uninterested in developments in science and technology and operations, and universal related courses are generally not available for postgraduates. Thus, although most instructors have Master's degrees in translation, it is often difficult to find qualified translator training teachers who are willing and able to teach terminology management, translation technology, or machine translation (Lu and Mu, 2007: 37).

Terminology management and other translation technology courses place a high requirement on the trainers who need to strengthen their knowledge of translation technology. This strengthening includes a basic knowledge of computers, computer networks, computational linguistics, natural language processing and terminology management. Therefore, it becomes a significant challenge to train first-line translation teachers to have and continually update their command of translation technology, improve their skills of modern information, and act as "intermediaries" in the information age.

### ***Insufficient capital investment***

Terminology management and other translation technology courses require the help of appropriate professional equipment such as computers with higher performance and CAT software. To introduce translation technology courses, there should be necessary funds, equipment, and teaching environments. Without the necessary equipment, computer-aided translation or machine translation teaching will be done on paper and cannot be performed correctly. In addition, the high price of translation software has further restricted the teaching and training of translation technology. China is now faced with the reality that the funding of liberal arts teaching

and research is limited; in the absence of relevant government policy, funding is difficult to secure. Without adequate capital resources, translation technology teaching is difficult to sustain.

### ***Lack of understanding***

In addition, teachers in translator training and teaching institutions lack sensitivity and an in-depth understanding of the importance of terminology management and computer-assisted translation and translation technology. Teachers often do not have a strong awareness of the translation market with a poor and narrow understanding of translation teaching. The rapid development of the translation market and market feedback help understand the goals and tasks of translation teaching activities more clearly. Only by continually tracking changes in the market can teachers gain first-hand information and then adjust their training programs and optimize their professional translation curriculum design.

### ***Lack of systematic teaching materials***

In professional translation teaching, textbooks are another major obstacle to implementing terminology management and other translation technologies. China still lacks systemic written teaching materials incorporating translation technology for translator training, and most teaching materials are imported from abroad.

In the compilation of teaching materials, the terminology management component may include the following elements: terminology and work to be done by translation management practitioners in terminology management, methods for creating bilingual or multilingual terminology databases, ways to use machine-readable terminology databases and other digital information resources to solve translation problems, and other components. The terminology management component should also enable students to be familiar with the use of the following softwares: Babylon, Foreignword and Trados Terminology. Meanwhile, several exercises can also be used for assessment such as creation of a machine-readable terminology database, and these exercises can address related issues in computer terminology management.

Currently, in mainland China, terminology management and other translation technology teaching materials are imported from abroad; popular textbooks include Professor Charles Meyer's *English Corpus Linguistics: An Introduction*, Professor Frank Austermühl's *Electronic Tools for Translators* and Professor C. K. Quah's *Translation and Technology*. The first of these teaching materials can be found on the network in portable document format (PDF), and the latter two have

been issued in mainland China. Although these materials have already proven to be mature, it is necessary to carefully screen and correctly utilize them in actual teaching situations in mainland China. If conditions allow, professional translators can be organized to address these materials problems.

### **Strategies for dealing with the problems**

As has been discussed above, there are some problems with translator training in China. They can be solved if enough attention could be paid to the following aspects: introduction of terminology management in translation teaching, cultivation of more qualified trainers, more capital investment, enhancement of terminology management awareness and textbook compilation and so on.

### ***Introduction of terminology management in the classroom***

To cultivate high-quality professional translators, professional undergraduate translation courses should focus on the following four areas: instrumental skills, professional skills, transferable skills, and actual translation work skills. Prioritizing instrumental skills indicates that translators should be familiar with the available translation tools and resources and master their use, especially terminology management software. Therefore, how to introduce terminology management into required professional translation courses must be given serious consideration.

Terminology management should be introduced into translation teaching. The various translation technologies and tools used by professional translators should be introduced to students, thus familiarizing them with the principles of computer-aided terminology management and providing them with skills for controlling, creating and using a machine-readable terminology database as a translation tool. This introduction is a feasible reform of translation teaching, which will enable students to adapt themselves to the challenges of the information society. Incorporating translation technology into the professional undergraduate translation courses will place an emphasis on terminology management and other translation technologies. In response to these strategies, an in-depth analysis of the translation market should first be conducted. Considering market changes and the development of universities, we can adjust the translation curriculum and actively explore teaching methods combining traditional translation teaching and modern translation technology. Terminology management will be fully used in translation teaching and translator training to improve the efficiency, thereby truly meeting the market

demand for professional translators.

### ***Translation faculty training***

In Europe and America, in particular, at the majority of universities in Canada, translation professors are mostly professional translators or terminologists or, in some cases, both. To establish terminology management and other translation technology courses, mainland China needs qualified faculty for the teaching of computer-aided translation and translation technology.

On the one hand, we can employ translation teachers with relevant professional backgrounds from abroad; on the other, we may better address the in-service training of translation teachers by sending interested teachers out to study at universities with mature terminology management teaching. With the development and expansion of a number of translation companies, teaching and training institutions' dealings with these translation companies have grown close, and the two fields can establish mutually beneficial relationships. Thus, in translation teaching and training, if the stakeholders can cooperate effectively, they will achieve win-win results.

A number of translation agencies in Hong Kong and Taiwan work in close cooperation with translation education institutions. For example, translation employees directly teach translation and interpretation students, and the students undertaking part of the translation work are directly associated with translation agencies. In this way, students learn to master relevant terminology management and other translation technologies, and a group of universities do not require their teachers to receive specialized training. However, in the teaching process, mastery of the cutting-edge translation technology by the university's first-line translation teachers has proven to be important in the long run.

According to Ke and Bao (2002) survey of the teaching of translation and interpretation around the world, some interpretation and translation teaching and training institutions have founded their own institutes or research centres. In comparison with sound educational systems in other countries and regions, including Hong Kong and Taiwan, machine translation and translation technology education in mainland China is still at a relatively early stage. Therefore, it is even more necessary for translation institutions to form their own research or study groups to enhance learning and the application of terminology databases and translation technology into the body of research and its implementation, which serves to improve translation instructors' knowledge and capacity for teaching translation technology.

Finally, the approach to interactive learning in translation teaching is encouraged to cultivate the self-learning ability of students, to continuously develop and utilize online resources, and to enable teachers and students

to exchange knowledge. Qualified universities can integrate different departments and various professional teachers, allowing them to share resources. Teachers and students of liberal arts and science and engineering can participate in the combination and application of modern technology and translation teaching, realizing their joint teaching and research goals.

### ***More capital investment***

Increasing capital investment, updating teaching equipment and installing translation software can ensure the smooth integration of terminology management and other translation technology into professional translation teaching.

At present, colleges and universities in mainland China have been notably successful in securing teaching hardware and computer-aided translation software such as Wordfast, Trados, and Masanobu CAT. Given its high visibility, the software has become the mainstream tool in the translation industry. Students must have access to translation technology and tools to avoid gaps between translator training and social development. In addition to relying on government financial education grants, the universities can also cooperate with enterprises to raise funds, purchase high-end equipment, and provide corporate feedback from translation services.

### ***Enhancement of terminology management awareness in translation training institutions***

Many years ago, the translation of a book was a long and tedious process, relying on a pen and a piece of paper, and the diction of every target-language word took much time. However, after computers became common, the process became much easier, relying on individual words entered into the computer. Today, given the development and use of translation technology, relatively accurate translation software is readily available, and computer-aided translation technology is used more widely in the translation industry.

With translation technology and software, the speed and efficiency of science and technology translation have improved their absolute share in the translation market. Therefore, higher education, as the main force of translator training in the translation industry, and professional education administrators and instructors should note the current developments and ensure consistency between their teaching philosophies and social needs, make the appropriate adjustments and updates to the curriculum, and increase the number of new courses related to translation technology (Qian, 2009: 52).

Using more sophisticated translation software, excellent translators with a good knowledge of terminology management and other translation technologies can ensure high-quality and efficient translation. In the future development of the translation industry, terminology management and other translation technologies will inevitably be used extensively. Therefore, translation educators must undergo an ideological change regarding the concepts, structure, and training in introducing terminology management and other translation technology courses. Professional translator training should meet the demands of the market for translator skills, and these market requirements should be reflected in curriculum design. Today's translation market has penetrated into all aspects of science and technology such that professional translators must master relevant technical skills. Universities should require terminology management and other translation technology courses in translator training to foster qualified translators for the translation market.

### ***Enhancement of research and compilation of textbooks***

Mu Lei's masterwork "Research on Chinese Translation Teaching" maintains that China's translation research in higher education began in 1902. In other words, China's translation study has more than 100 years of history. With the development and historical evolution of translation research, and in particular, the advent of the information age, changes are necessary for the content and form of translation teaching. In the information age, Computer Science and Information and Communication Technology (ICT) have developed rapidly, and the introduction of new technologies and new products in the translation field is seemingly endless. Thus, translation technology courses can be greatly diversified. In the design of course modules, it is necessary to consider not only the current characteristics of the content but also its practicability.

Professor Ke Ping of the Foreign Languages Institute at Nanjing University teaches Language and Translation Technology (LTT) for Master's and doctoral graduate students in linguistics and translation studies, one of the few required courses aimed at enhancing language and translation technology competence. He uses three books as curriculum resources: Professor Charles Meyer's *English Corpus Linguistics: An Introduction*, Professor Frank Austerlühl's *Electronic Tools for Translators* and Professor C. K. Quah's *Translation and Technology*. He also provides a reference for other institutions interested in designing translation technology programs and provides guidance for full-time and part-time translators aiming to improve their translation skills. As for those Chinese students studying translation technology, preparation of translation technology materials for them should be on the top agenda.

## CONCLUSION

As the integration of domestic and international markets accelerates the pace of international exchange and cooperation, the development of the translation market makes higher demands for translator training. Terminology management and other translation technologies are increasingly being used. In this information era, a professional translator is not only proficient at language but also skilled in learning and using terminology management and other translation technologies. In mainland China, it is necessary for translation education and training institutions to offer terminology management and other translation technology courses. All translators should set professional standards for themselves and prepare to meet new challenges. Thus, the translation industry in mainland China will advance to new heights.

## Notes

For Chinese researchers, Chinese National Knowledge Infrastructure (short for CNKI) is a very useful tool for reference. For the references on machine translation/translation technology/terminology management/teaching and research/software review /network technology in this paper, you can visit <http://epub.cnki.net/grid2008/index/ZKCALD.htm>.

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