I. INTRODUCTION

This essay mainly proposes the integration of translation technologies, e.g., machine translation (MT) and translation memory (TM) tools, into Taiwan's current translation teaching to achieve the goals of practicability, authenticity and relevance. MT, "refers to translation which is performed wholly or partly by computer" (Shuttleworth & Cowie, 1997: 99). We could use the software to automatically translate a document from one language into another within seconds. However, the rough MT output is usually semantically ridiculous, so it requires further editing.

Unlike MT, TM cannot perform automatic translation of an entire text and immediate word lookup. TM, defined by Juan C. Sager, is "a translation strategy whereby translators use computer programs to perform part of the process of translation" (1994: 326). TM tools are only capable of translating sections of text that are retrieved from the established TM databank through either exact or fuzzy matching. In addition, TM tools allow the automatic creation of translation memories and term bases, automatic conversion of dates, numbers and units to the target culture, and translation of web pages and tagged files without destroying the original format.

Implementation of MT & TM tools aims at achieving the goal of practicability. This goal is to provide students with the technology-enabled translation learning setting that professional translators have encountered. The goal of authenticity is to allow students to practice translating the authentic, specialized materials that professional translators usually address. The goal of relevance is to assess the students' translation works based on the needs of different readers and for different purposes. These goals of technology-driven modifications respond to the changed scenario of the present translation industry in which professional translators use MT and TM tools to assist in massive translation of software and electronics documentation with the need for regular upgrades.

Since the localization industry and the dissemination of knowledge and information on the Internet have increased the need for real-time translation, translation is more professionalized than ever. To stress translation as a new profession, Peter Newmark declared that translation was relatively a new profession "due to the great

increase in the varieties of translation texts and the number of texts and languages translated" (1991: 62). He also pinpointed that the translator has changed from "an invisible, anonymous position to a visible and responsible presence and from an amateur to a professional status" (Newmark, 1991: 5). Indeed, the recent advance in computer technology has boosted the proliferation of translation technologies like MT and TM tools, and these technologies have significantly affected professional translation. The texts that occupy the largest market share in the localization industry, according to the survey of the Localization Industry Standards Association (LISA), are technical, informative texts of "software, information technology hardware, electronics, and medical/pharmaceutical" science (LISA, 2003: 21). The role of a translator also changes from a few professional experts or linguists to the bilinguals from various majors who know the use of advanced technologies as aids. In addition, the success of translation that used to depend on the human translator's linguistic/translation competence, has much to do with the translation tools used. The changed role of translator and the re-definition of translation as a new profession have ushered in a new era of translation.

In pace with the new trend of technology-enabled translation industry, the author suggests integrating the components of MT and TM into the current translation curriculum to assist in human translation. Since many people have the misconception of these two translation technologies, Section Two of this paper would introduce them and defend them as friends of human translators. In Section Three, the author wants to re-examine today's translation curriculum in Taiwan and check whether the school's translation training is relevant to the demands of the translation market. Thus, she assesses the current translation teaching at Taiwan's universities and outlines some weaknesses. Section Four suggests some modifications, including the use of authentic, specialized materials, relating translation assessment to different readers, purposes, more English-to-Chinese translation practice, and technological input of MT and TM. Since there is, at present, no widespread implementation of the technology-assisted translation program in Taiwan, the author explores the reasons for this prohibition in Section Five. Section Six proposes some practices as tentative solutions that involve in-service training in MT/TM, funding from the local government, collaborative teaching, seminars or special

conferences on MT and TM, cooperation between academy and industry, and regular technical support. The final section concludes the above discussions and stresses the need for the enforcement of these proposals to brighten the prospects of computer-aided translation teaching in Taiwan's near future.

II. MT/TM AND TRANSLATORS: ENEMIES OR FRIENDS?

Since the Machine Translation (MT) technology reached Taiwan's market in 1980s, it has been controversial. Some people ridiculed MT as the abbreviation of "Mad Translation." Others argued that translation was an art, so the mechanized translation produced by the MT system could never be acceptable. I admit that these criticisms of unedited MT drafts are valid. Because the current MT system cannot parse complicated and ambiguous sentence structures, and cannot translate words and phrases at the inter-sentential level, the MT output is far from perfect. However, the MT output could reach 30-60% accuracy, depending on text types and language pairs. For example, when one used the MT tool to translate domain-specific technical texts with restrictive changes in lexical items and syntactic structures, fewer MT errors resulted and the MT outputs could reach 60% accuracy.

However, MT systems could not be used to translate literary works. The MT system does work only when it is used to translate the right type of technical documentation in the right way. The translation industry has used MT with good results. Xerox uses Systran to translate English documentation into multiple languages and Perkins Engines has used the Weidner system to translate technical documentation (Hutchins, 2001: 3). These successful examples encourage the translation instructors to introduce MT systems to the trainee translators.

In the 1990s, workstations for the commercial translator like the Trados Workbench, the IBM Translation Manager and the STAR Transit workstation fostered the localization of computer software. These workstations are known as Translation Memory (TM) systems. In the localization industry, TM tools provide a crucial advantage to the professional translator because the upgraded technical texts, e.g., computer software documentation, has a high percentage of content repeatability, so the TM system helps

search the already translated parts in translation memories and then insert the exactly or fuzzily matched parts into the target text. The use of TM shortens the turnaround time of translation and saves the cost because the translator does not have to translate the same sentence again. Moreover, terminological management function is provided for easier consultation to produce terminological consistency when several outsourced translators must collaborate on a large translation project. These advantages of TM use explain why it has to be implemented into the current translation teaching.

III. ASSESSMENT OF CURRENT TRANSLAION EDUCATION

Before we discuss how to integrate MT and TM into the translation course, it is necessary to re-examine the teaching content of the current translation education in Taiwan and check whether the school's translation training is corresponding to the professional needs in the translation industry. The following points are what the author of this article has observed as specific problems of the present translation teaching at Taiwan's colleges and universities.

3.1.Translation used for language learning/teaching

Some translation curriculum stays at the level of language teaching and learning. Other translation activities are designed to test or strengthen students' linguistic competence with an evaluation of their literal interpretation (interpretation of the denotative meaning of each word) and transformation of the source language sentence structure. Some instructors take translation as an alternative means of testing students' reading comprehension. Others use Chinese-to-English translation to test students' grammatical ability and then use the translation practice to reinforce students' knowledge of grammar. In addition, translation is sometimes viewed as a way of vocabulary-building. In short, instructors have the misconception that translation is strictly the act of processing the linguistic problems. They have overlooked other factors such as the client's specification (demands) and the cost-effectiveness.

3.2. Lack of the use of translation technologies as aids

Many translation instructors do not introduce students to MT and TM technologies.

These teachers do not understand these technologies themselves, and therefore are in no position to teach them to students. Actually, the real localization environment uses the TM technologies to shorten the turnaround time, labor and costs. The trainee translators who lack these skills must struggle to fit into the localization industry.

3. Teacher as the only assessor and reader

Student translators want to please their teachers as the only evaluators and readers. They hope to convince their teacher that they understand every word in the original text. To demonstrate their competence, students produce mechanical, literal and word-for-word translations. They do not produce the communicative, sense-for-sense translation. They forget that professional translators produce works for a wider readership and not for a single person, such as an instructor.

4. Transfer from one's mother tongue into the foreign language.

Translation practice emphasizes transfer from one's mother tongue into the foreign language. However, the real translation environment also demands translation from the foreign language into the mother tongue. As noted above, some translation instructors used translation practice as a way of strengthening students' competence in English, so that they emphasize the Chinese-to-English translation.

3.5. Literary texts instead of technical or informative texts

Most texts for student translation practice are literary rather than technical and informational. Newmark has stated that "the text types selected for translation practice in current translation curriculum lack variety in genre and discipline and they have the tendency to be restricted to the literary texts" (1998: 40). The translation instructor used the students' translation of literary texts with lexical and syntactic difficulties to test whether they could grasp the implicit meanings. Nonetheless, the given excerpt was incomplete, so it was difficult for the students to comprehend. Actually, literary translations occupy a small percentage of the translation market. The focus on non-specialized literary translation could hardly prepare students for the professional world (Sewell, 1996: 137).

IV. MODIFICATIONS

To modify the current translation curriculum, the author proposes MT/TM technological input, changes in authentic, specialized materials, reader-oriented assessment, and more English-to-Chinese than Chinese-to-English translation practice.

1) MT and TM technological input

To meet the needs of cost-effective translation in the localization industry, MT and TM technologies have become indispensable. Thus, trainee translators have to learn the operation of MT and TM tools. The translation instructor has to integrate the MT and TM components into the curriculum. The MT/TM teaching could start with a theoretical introduction to the field, followed by the hands-on practice with MT and TM tools.

The author suggests a sample of the modular-oriented MT/TM teaching syllabus, designed for the trainee translators on both the MA and BA levels, with a focus on English-to-Chinese translation. **Weeks 1-2 go to a lecture on the historical sketch of MT and TM, significant features of MT and TM tools and pedagogical advantages of learning MT and TM tools. Weeks 3-8 focus on post-MT editing practices with a host of editing strategies such as lexical change, lexical deletion, lexical addition, grammatical features modification and word-order change. Weeks 9-11 move the focus to pre-MT editing practice that consists of adaptation of the MT dictionary and textual paraphrasing. Weeks 12-17 concentrate on the use of TM tools, including the building up of the TM databank, specialized term bases, the use of fuzzy and exact matching functions, concordancer, the localization function and the use of TM tools to translate the web page without the need of typesetting. In the final week, the instructor can give students an on-site test on the operational skills of TM and pre/post-MT editing.** The instructor could also ask students to submit a portfolio of term bases and TM databanks that they have completed in the translation class. In addition, the instructor could ask students to write a written report or paper on some MT and TM-specific issues (e.g., a comparison of MT and TM). This syllabus is not exhaustive, but indicative. The instructor could modify it to meet the objectives of the translation course.

A short introduction to the history of MT and TM technologies, technical functionalities and the pedagogical values of MT and TM tools will encourage students to learn

advanced translation technologies. Hands-on practice with pre- and post-MT editing and the essential tools of TM could equip students with indispensable technological skills. The portfolio of the term bases and TM databanks that students have completed during the class helps the instructor evaluate students' translation performance when using the TM tools.

2)Authentic, specialized materials

Training in the use of MT and TM needs to use specialized materials for students' practice because these materials are written in simple sentence patterns and have a limited size of vocabulary. These days, the localization industry has to process the user's manuals for computer hardware and software, heavy equipment, aeronautics, automobiles, telecommunications, and digital technologies. In addition, the texts that come into the translation department of a government agency or a company range from weather reports and traffic reports to medication instructions. All these are technical and informational texts.

In her German-English/English-German translation class, Christine Klein-Braley taught translation of the railroad timetable, tourist information materials, a speech delivered by the German foreign minister at the ASEAN Conference, the brochure for an oral history museum and a booklet about beer-brewing (Sewell, 1996: 26). Karla Dejean Le Feal, who teaches French-English/English-French translation, uses, among other sources, an excerpt from a training manual for electrical engineers and the introduction to an international conference (Sewell, 1996: 146). In her MT and TM classes, the author has used the instructions for hair dye, an air cleaner manual, a Honda automobile user's manual and web pages as translation materials. All these are authentic, specialized materials that find meaning, value and vitality to show students how professional translators work.

3) Relevance of translation assessment to different readers and for different purposes

The instructor should assess the students' translation works based on the principle of relevance. The target language text should reflect the expectations of the readership and the purposes of the translation. For example, **the MT output requires strict editing**

when we use the resulting text for information dissemination. However, the MT output simply needs loose editing when we use it for an individual's information assimilation.

Different readers have different requirements and expectations. **The high-technical readers or technical experts use the MT output for gisting translation and do not need strict post-MT editing, but the massive audience with the weak technical background wants to read clear messages from the MT output.** To relate translation assessment to different readers and for different purposes, the trainee translators need to learn to meet the client's specifications.

In evaluating the quality of the TM/MT-assisted translations, the instructor should consider length of time that the translation took the students to complete. In the real translation environment, every missed deadline is costly. All clients want their translations as soon as the product is ready for the market. In making translation education relevant to the translation industry, time, translation purposes and the needs of the client are all factors that a TM/MT instructor has to consider in assessing students' assignments.

4) Need of more English-to-Chinese translation practice

There are more opportunities to translate from English into Chinese than from Chinese into English in the professional translation market, so this should be reflected in the translation training. The MT/TM instructor must rid students of the misconception that Chinese-to-English translation practice will strengthen students' English proficiency. Chinese-to-English translation practice emphasizes the process of decoding the Chinese text, finding appropriate English equivalents and solving some problems arising from the linguistic and socio-cultural divergences between Chinese and English. This practice aims to improve students' translation performance rather than their English proficiency.

Many trainee translators overlook their ability to use their mother tongue. This results in westernized Chinese translations of English texts. Students ignore the difference between excellent Chinese and poor Chinese translations. Actually, some Chinese translations read more smoothly and naturally than others. Students need to practice more English-to-Chinese than Chinese-to-English translation. At the same time, students

have to understand that improving their Chinese proficiency is just as important as improving their proficiency in English.

In conclusion, some modifications with the integration of MT and TM will achieve the goals of authenticity, practicability, and relevance. Authenticity is achieved when the instructor uses authentic materials for students' MT/TM-assisted translation practice. Literary translation practice should be replaced with automobile owner's manuals and printer operation instructions. Practicability is achieved when the students learn the MT and TM system that professional translators have used to process their daily work in the localization industry. Relevance will be achieved when translation assessment responds to the needs of a range of readers who have differing needs.

V. THE PROHIBITION OF TECHNOLOGY-ENABLED TRANSLATION PORGRAMS

The use of translation tools has transformed the international translation industry and the working environment of a professional translator. In response to these changes, the author has discussed ways of modifying translation training by incorporating MT and related computer aided translation or TM elements. However, an online survey has found that only three universities in Taiwan provide MT or TM-relevant programs: Taiwan Normal Graduate Institute of Interpretation and Translation, the English Department of Kaohsiung First University of Science and Technology and Jen-Long Christian University. If great pedagogical rewards could result from the implementation of MT/TM programs, there must be some reasons why so few universities provide technology-aided translation programs.

1) No urgent need

Many translation instructors have a misconception that trainee translators or language students graduating from Taiwan's universities do not need advanced MT/TM skills. Moreover, they assume that industrial companies or translation agencies are supposed to provide employees with this kind of in-service training. In fact, lack of MT/TM programs means that graduates with language majors cannot find employment in the technological companies or in the localization industry. Furthermore, these graduates

are less competitive since they could not use the translation technologies to promote translation efficiency.

2) Psychological resistance

Although some translation instructors are aware that training in MT/TM tools is growing in importance, they are psychologically resistant to it. They assume that the translation technologies are too complicated to learn, regardless of their usefulness and convenience. However, the more they reject the information technology (IT) tools, the less effectively they design the translation tasks and the greater the disservice they do to their students.

3) Indifference

Some translation instructors assume that teaching MT/TM tools is the responsibility of computer science or information technology teachers. However, computer teachers do not teach MT/CAT systems such as TransWhiz (an English-to/from-Chinese MT system) and Trados Translator's Workbench (a TM system) in the IT course. The computer science teachers claimed that teaching MT/TM tools still needed students' involvement and pre/post-MT editing required the translator's linguistic and translation competence. It was therefore important to improve students' translation skills. Only the translation instructor could teach MT and TM technologies and simultaneously teach students translation skills with pre/post-MT/TM editing.

4) Lack of funds

Schools usually promise to fund hardware and computer facilities, but express no interest in purchasing MT/TM technologies or IT tools. In the worst case, some schools are not ready to replace the outdated hardware, so advanced software cannot be supported. If schools cannot afford to upgrade their computer facilities, it is impossible to use the latest MT/TM technologies. Under these circumstances, it is impossible to offer MT/TM training.

VI. SOLUTIONS

The author suggests some solutions and hopes to make academic training in translation relevant to the global trend in the translation market.

1) In-service training

The MT and TM technologies could be introduced to the translation teaching staff under supervision of technical personnel. Sales managers or technicians could be invited from the software companies to teach translation instructors how to operate MT and TM tools. The translation instructors could also teach themselves MT and TM skills. Nonetheless, self-training takes a great deal of time and effort.

2)Funding

Local governments could consider funding and sponsoring some in-service training activities on MT and TM. Doing so would trigger reform in the translation teaching landscape. To gain this financial support, translation instructors could submit project proposals to the Ministry of Education or National Science Council. They could also ask the department heads to apply for internal grants to upgrade the hardware and software to prepare for the implementation of MT and TM education.

3)Collaborative teaching

Collaborative teaching is another solution to MT/TM education. Professional translators are invited to school to speak to translation classes irregularly. They could also regularly lecture in a class as a part-time teacher. Their experiences of using MT and TM tools could be valuable to students. Their knowledge could improve teachers' and students' awareness of the professional translator's working environment.

4)Seminars or special conferences

The school or technological companies could organize seminars and conferences on the issues of MT and TM to disseminate the knowledge of technology-enabled translation program. The acquisition of MT and TM information could remove the translation instructor's bias or misconception of the translation technologies.

5) Internship or on-the-job training programs

The school should collaborate with software or technological companies to undertake some translation or localization projects. Students should have the opportunity to learn the use of the sophisticated translation technologies in the real translation environment. These well-trained students could be a useful resource for the localization industry or translation companies. Cooperation between academy and industry could culminate in an

MT and TM internship program.

6)Technical support

The school could sign a contract with MT/TM companies or agencies and asks them to provide regular technical support. The technicians from MT/TM companies or agencies could provide the MT/TM instructor with constant and instant technical consultation when s/he encounters problems with the MT and TM programs. These technicians could also access the technical software and computer facilities of the school for their upgrade.

If the school and translation instructors accepted the above proposals, students could learn advanced professional translation skills and improve their language proficiency. They would learn MT/TM skills. Knowledge of MT and TM could spread through the local translation community to increase the number of course offerings in MT and TM. In addition, the school is beneficial in getting extra income through collaboration with enterprises when the instructor and students make a team to receive outsourced translation from TM tools providers or translation companies. The translation instructor could also work with technological companies to develop specialized TM term bases. In short, collaboration with industries is beneficial for school, teachers and students to create a "win-win-win" educational environment.

VII. CONCLUDING REMARKS

The success of language engineering research and MT/TM technological development has offered labor- and cost-savings. Thus, MT/TM technology holds an important place in the working environment of future professional translators. The provision of MT/TM-relevant education deserves attention from academia. The European Commission funded "Language Engineering for Translators Curricula" (LETRAC) has proposed three curriculum modules for European universities to re-orient training toward computer-based applications (Badia, 1999: 7). These three modules are "Introduction to Computer Science," "IT and DTP for Translators," and "Language Engineering." Translation instructors could take these modules and modify them as needed. Although there is, at present, no upsurge in demand for MT/TM-enabled translators in Taiwan,

students should not be deprived of this training, which has become essential in other countries' translation industry.

The MT/TM education is not a panacea for all translation problems. Rather, its purpose is to encourage students and teachers to use these tools to cope with the increasing quantity of translations. In addition, training in MT/TM systems is not an extra academic burden. Instead, it is a gateway to the professional world of localization and internationalization.

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