Suggesting CAT Tools Curriculum to Translation Departments in Iraq

Lect. Jalil Naser Hilu
Asst. Prof. Baydaa Ali Latif (PhD)
Mustansiriyah University

إقتراح منهج لتدريس أدوات الترجمة بمساعدة الحاسوب (CAT) في أقسام الترجمة في العراق

م.جليل ناصر حلو
أ.م.د. بيداء علي لطيف
الجامعة المستنصرية

Abstract

This study investigates the applicability of teaching Computer-Assisted Translation (CAT) tools in the Iraqi translation programmes to accelerate the pace of using translation technology in classrooms. The study explores the translation competences relating to teaching translation technology namely CAT tools. The researcher reviews state-of-the--art methods of teaching translation technologies and suggests a textbook and a detailed curriculum that can be adopted in the Iraqi translation departments. The suggested curriculum contains a theoretical part and practical sessions and assignments. The study also suggests an assessment to evaluate the learning outcomes achieved by the proposed curriculum .

Keywords: CAT tools, translation technology, Iraq, translation education, translation curriculum

المستخلص

تتحرى هذه الدراسة إمكانية تدريس أدوات الترجمة بمساعدة الحاسوب (CAT) في مناهج الترجمة في العراق من أجل حث خطى إستخدام تكنولوجيا الترجمة في صفوف الدراسة.وتسبر الدراسة غور مؤهِلات الترجمة ذات العلاقة بتدريس تكنولوجيا الترجمة لاسيما أدوات الترجمة بمساعدة الحاسوب (CAT).ويستعرض الباحث أحدث طرق تدريس تكنولوجيا الترجمة ويقترح كتاباً ومنهجاً دراسياً يمكن إعتمادهما في أقسام الترجمة في العراق.ويضم المنهج المقترح جانباً نظرياً وجلسات عملية إلى جانب المهام الدراسية.كما تقترح الدراسة تقييماً للنظر في إنجاز المخارج التعليمية المتحققة من المنهج المقترح.

الكلمات المفتاحية أدوات الترجمة بمساعدة الحاسوب، تكنولوجيا الترجمة، العراق، تعليم الترجمة، مناهج الترجمة

Introduction

Scholars in the field of translation studies have shown an increasing interest in Translation Competence (henceforth TC), prompting an important demand to create TC models. Researchers generally agree that TC is a main component covering sub-components. According to Göpferich (2009), scholars have different opinions on the nature of these sub-competences.

The traditional translation process adopted in the Iraqi translation departments during exams and quizzes are similar to that used forty years ago. The student is given the exam paper containing the source text in addition to the examinee information and is asked to render the text from the source language (SL) to the target language (TL) without using any (paper or digital) dictionary or terminological sources (Sultan,2007, p.84). This reveals that the present translation education programme in Iraq does not cope with the global advances in teaching translation and lacks the requirements needed to make students prepared and ready to deal with global translation market. In fact, in an "old-fashioned and/or underdeveloped educational setting as that in Department of Translation which is years lagging behind the technology-based classes, such an objective is not easily attainable" (Sultan, 2007, p.96). One of the market requirements is using translation technologies, tools and up-to-date textbooks that can widen the translator's prospective in the translation education as a whole.

According to Garcia (2015, p. 68), Computer-Assisted Translation (CAT) systems are software applications designed to increase the efficiency and reliability of human translators, cutting down on project expenses without sacrificing quality or the income of freelance translators. According to Bowker, CAT may

also refer to "any sort of computerised instrument that translators utilise to do their duties" (2002, p. 6).

Fundamentally, CAT systems allow the reuse of previous (human) translations stored in so-called Translation Memory (TM) databases, as well as the automatic application of terminology stored in terminology databases. These essential features may be complemented by alignment tools and term extraction tools to construct searchable word bases from TMs, multilingual glossaries, and other publications.

The purpose of CAT systems is to aid translators and translation buyers by enhancing efficiency and ensuring consistency, even when several translators are working on the same task. They also aid greatly in the prevention of mistakes with the use of automated quality assurance (QA) capabilities that are now standard in all commercial systems.

To achieve the ultimate end of using the state-of-art technologies for the good of the translation pedagogical process, translation students have to be taught CAT tools at both undergraduate and postgraduate levels. This study investigates the feasibility of integrating CAT tools into the Iraqi translation departments programmes to prepare translation students to professional life and translation market.

The following is a comprehensive overview of the literature pertaining to three widely recognized TC models: the PACTE models (2000, 2003,2017), Göpferich's model (2009), and the EMT models (2009, 2017). These models are presented here to pave the way to introduce a detailed technology- oriented plan to integrate CAT tools into Iraqi translation programmes.

PACTE's Translation competence models

The PACTE group is a research group that was founded at the UniversitatAutònoma de Barcelona, Spain, by translation trainers who were faculty members at the UniversitatAutònoma de Barcelona's Faculty of Translation and Interpreting. Additionally, they have expertise in the field of translation and worked as professional translators (Hurtado Albir, 2017b). Since its founding in 1997, the PACTE group has been examining the acquisition of TC (PACTE, 2003).

The group's focus is on carrying out empirical studies based on a communicative approach to translation. As they see translation as a communicative act, they build their concept of TC on the idea of communicative competence. Additionally, they have used concepts of "expert knowledge" and "learning processes" from the related fields of pedagogy, psychology, and language teaching. PACTE has defined TC as "the underlying system of knowledge required to translate" (2011, p. 4).

The objective of PACTE (2000) was to develop a model of TC supported by empirical evidence. They first suggested a holistic model (see Figure 1 below). PACTE's first model, which drew upon the relevant research, comprised four basic competencies: psycho-physiological competence, extra-linguistic competence, communicative competence in two languages, and instrumental-professional competence. Along with these competencies, the model also included strategic competence—a complex competence that is recursive in nature because it occurs at every stage of the translation process—and transfer competence, which is essential to the four basic competencies.

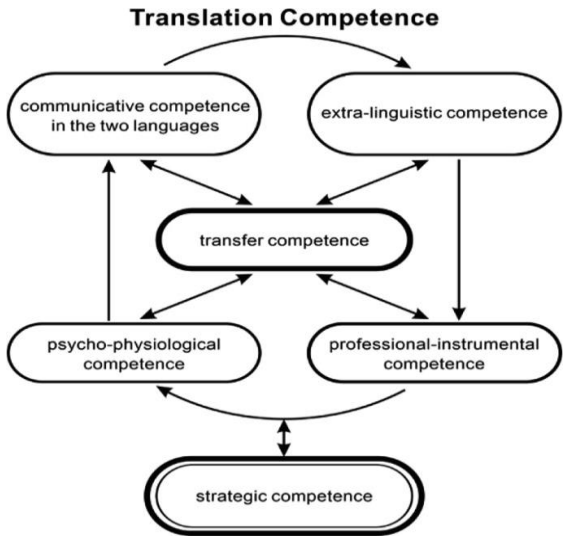

Figure *1. PACTE Model (PACTE, 2000,p.3)*

The original model underwent modifications and revisions following a series of investigations undertaken by the PACTE group in 2001 (PACTE, 2017). As a result of these investigations, the model was altered to take the shape seen in Figure 2 below. One significant distinction between the two models is in using the concept of sub-competence as opposed to competence, which was employed in the 2001 model. Furthermore, several original competences underwent replacement or combining, while others relocated inside the model. Given that the translator's transfer ability is entwined with each of the TC subcomponents, transfer competence was given the most consideration in the updated PACTE model. This reconsideration of transfer competence served as a basis for conceiving of communicative and strategic competencies. As a result, the 2003 model replaced the ability to communicate well in two languages with the ability to communicate effectively in a bilingual context. Additionally, strategic skills became more important, replacing transfer

competence. The concept of instrumental-professional competence has been subdivided into two components: instrumental sub-competence and knowledge of translation sub-competence. This division has been made in recognition of the significance of having a thorough understanding of the translation process. Because of its importance in expert knowledge, psycho-physiological competence was renamed as psycho-physiological components, replacing the former position of strategic competence.

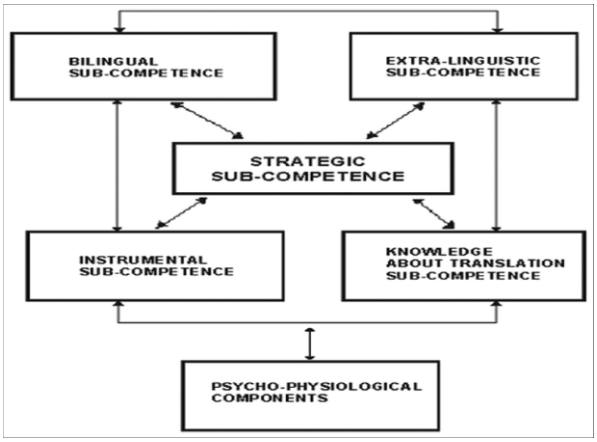

Figure *2* . *PACTE final model* (PACTE,2003, p.60)

PACTE (2017) claims that TC encompasses a combination of procedural and declarative knowledge; declarative knowledge refers to the understanding of notions or concepts, encompassing knowledge about specific information. On the other hand, procedural knowledge pertains to the knowledge of how processes are executed or put into practice. The extra-linguistic and knowledge about translation sub-competences are mostly declarative, while the bilingual, instrumental, and strategy sub-competences are mostly procedural. Furthermore, according to PACTE (2003), every sub-competence and psycho-physiological

component involves multiple facets or sub-components (See Figure 3 below).

Figure *3. sub-competences of PACTE final model*
(Salamah,2021,p. 281)

Göpferich's TC model

In 2009, Göpferich constructed a TC model that was influenced by the PACTE model (2003) and other pertinent literature (see Figure 4 below). Her paradigm is composed of six competencies: psychomotor competence, translation routine activation competence, tools and research competence, domain competence, communication competence in at least two languages, and strategic competence. Salamah states that "Göpferich's communicative competence, domain competence, tools and research competence, and strategic competence are closely related to PACTE's (2003) bilingual sub-competence, extra-linguistic sub-competence, instrumental sub-competence, and strategic sub-competence, respectively" (2021, p. 282). Psychomotor competence comprises the ability to read and write through using psychomotor skills. According to Göpferich, psychomotor skills that are not well developed lead to a higher

cognitive load and vice versa. The last competence, translation routine activation competence, is concerned with the transfer mechanisms required to achieve "acceptable target language equivalents" (Göpferich, 2009, p. 22).

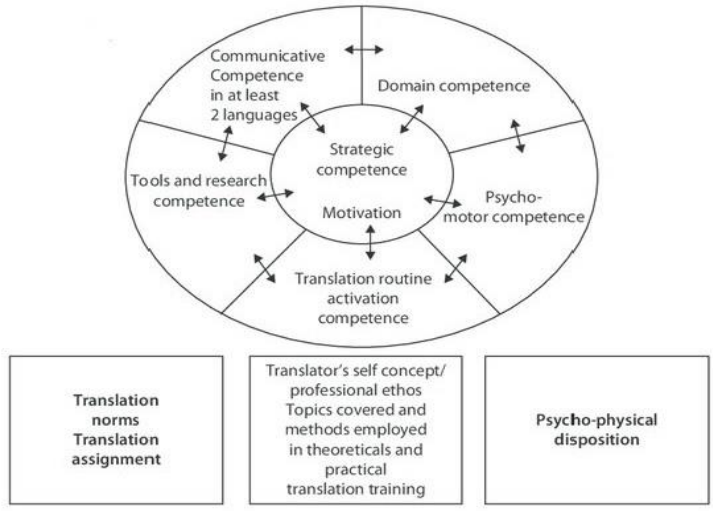

Figure 4. *Göpferich's TC model* (*Göpferich,2009)*

EMT expert group's TC models

The European Master's in Translation (EMT) serves as a comprehensive framework for evaluating and standardising translation and interpreting training programs within the European Union (EU) (Chodkiewicz, 2012). It came about as a result of the increased demand for excellent translation services provided by highly skilled interpreters and translators. The establishment of the EMT reference framework was a direct response to the European Union's diverse linguistic landscape, which was further complicated by the growth of trade relationships between member states, the accession of new countries to the EU, the necessity to regulate the translation profession, and the identification of

essential criteria for translation training programs (EMT Expert Group, 2009). (see Figure 5).

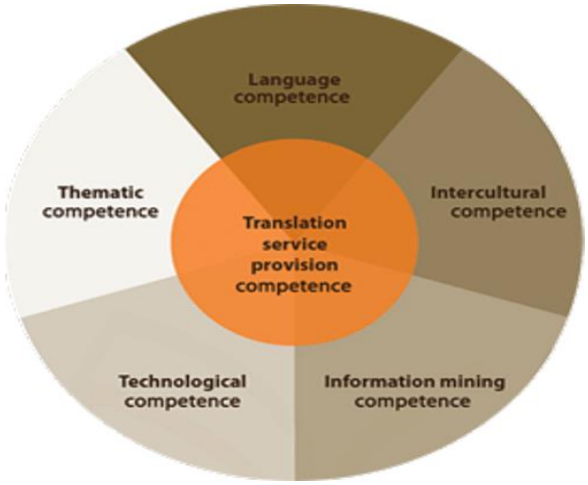

Figure 5 .*EMT Expert Group's TC Models*

The initial EMT model consisted of six sub-competences, as defined by the EMT Expert Group in 2009. These sub-competences "include translation service provision, language competence, intercultural competence, information mining competence, thematic competence, and technology competence" (P. 55). The competence of translation
provision services encompasses an interpersonal dimension, which focuses on the translator's contribution to society, including the needs of the job market, dealings with clients, and other factors related to the professional practice of translation. This competence also had a production aspect, which focused on achieving the client's guidelines, employing suitable tactics and methodologies, making revisions, and ensuring quality control.

According to this model, "language competence refers to the capacity to understand and use grammatical, lexical, idiomatic, graphic, and typographic structures and conventions in both languages. Intercultural competence was divided into two separate

aspects: a sociolinguistic component and a textual component" (EMT, 2009, p.56). Competence in information mining is linked to various areas of information processing, including documenting, handling terminological difficulties, and employing resources and technologies. Thematic competence refers to the combination of subject-matter expertise and the ability to find and utilize such expertise. Technological competence refers to the proficient use of "software, multimedia, and Machine Translation (MT)" in translation (p. 58).

In the year 2017, the EMT Board released an updated and revised edition of the EMT framework of reference (see Figure 6 below). The revised framework incorporates the foundational principles established by the EMT Expert Group, but "it also takes into account the research outcomes on translation and translator competence reported by the translation studies community and the changes that have affected the language service industry" (EMT, 2017, p. 3). The revised structure also incorporated modifications prompted by technology advancements.

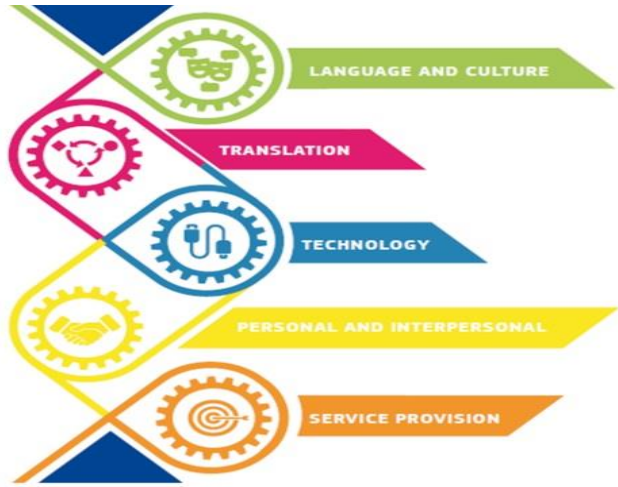

Figure 6. *EMT Expert Group's revised TC model*
(EMT,2017,p.4)

The competence framework comprises five components that mutually enhance each other as follows (EMT, 2017):

1. "Language and Culture": This component includes knowledge and abilities related to language, sociolinguistics, and culture. This component serves as the foundation for the remaining components of the framework.
2. TC refers to the ability to transfer information accurately and effectively during the translation process. It covers various skills, including strategic, methodological, and thematic competences, which are essential for successful translation.
3. The "technology component" involves the understanding and proficiency in utilising translation technologies, MT software, and CAT tools.
4. "Personal and Interpersonal Competence": This competence contains the requisite skills and abilities that translators must possess in order to enhance their prospects for employment. These include effective time management, the ability to work under pressure, stress management, meeting deadlines, conforming instructions, expertise in teamwork, utilisation of social media, and adaptability to professional settings.
5. "Service Provision": The final competence involves providing professional translation services. This entails an awareness of market needs, dealing with clients, financial planning, project coordination, etc..

In conclusion, it is evident that the TC models examined in this section share certain characteristics, namely their componential nature. In addition, it is worth noting that while the specific sub-competences or components may differ across different models, there is a broad consensus regarding the sub-

competences pertaining to language competence, cultural awareness, and understanding of the translation process.

It is evident that all models agree on the significance of technology and designate it as a fundamental proficiency that a proficient translator should possess. The possession of this particular set of computer-related skills is of utmost importance for language professionals operating inside the current market. The translation service provision sub-competence, which is considered as critical competence of the EMT model, would be unachievable without the technological resources (including tools and skills) that form its foundation.

The next part endeavors to identify the instrumental/professional sub-competence by employing the nomenclature proposed by PACTE in 2003.

PACTE	EMT	TransComp
language sub-competence in two languages	TRANSLATION SERVICE PROVISION SUB-COMPETENCE	communicative sub-competence in at least two languages
extra-linguistic sub-competence	language sub-competence	domain sub-competence
instrumental/professional sub-competence	**technological sub-competence**	**tools and research sub-competence**
psycho-physiological sub-competence	intercultural sub-competence	translation routine activation sub-competence
transfer sub-competence	information mining	psychomotor sub-competence
STRATEGIC SUB-COMPETENCE	thematic sub-competence	STRATEGIC SUB-COMPETENCE

Table 1. *Status of translation technology in the Three TC models* (Kornacki, 2018, p.39

Due to the general nature of the models, enormous technology implementations in a variety of institutions have become feasible. In light of this, let us succinctly summarize the tenets of the competence models, specifically those of the EMT's model, which is the most prevalent due to the EU's business influence: what matters most are the interconnection and balance of the competences. Linguistic and intercultural competences are essential for any translator to produce a translation of adequate standards. A translation produced by a translator lacking competence in thematic analysis will be linguistically accurate but may contain thematic inconsistencies or errors.

In conclusion, failure to prioritise the competence of providing translation services may result in the student producing a culture-bound translation that is accurate in both grammar and theme and employs the most suitable tools for the job at hand, but will not have the capacity to effectively market his work.

These models provide a framework that can be utilised by students, instructors, and institutions to design a curriculum that effectively prepares translators for success. Using the models will not success by itself, but not using them will put translators behind the competition from the start.

Application of translation models

Prior to course design, it is essential to establish the features that define the course based on the collected data. The data will be derived from the courses that have already been investigated and documented. This includes both the courses studied through literature in the theoretical section, as well as the universities whose profiles were built based on the research conducted for the thesis. The theoretical section provides a description of the

methodologies that are now prominent or emerging in modern translation teaching. This part will focus more on the practical application of technology in a modular manner.

The purpose is to design a collection of modules or course features that can be used independently or in combinations for the development of translation curricula. Specifically, this refers to the techniques that can be employed to implement CAT tools and the process of integrating these tools into translation programmes. It is essential here to realise that educational opportunities for technology competence should coincide with training for translation provision competence.

Student-centred approach

Self-motivation, a student-centered approach, and perpetual self-learning are inextricably linked and cannot be discussed in isolation. The mindset must be developed appropriately if one hopes to produce personalities that can continue learning even after graduation. Although each student's personality is a factor in this ability, it may, nonetheless, be molded and guided.

In order to allow their students to realize the significant impact they have on their own learning, lecturers should relinquish their position of authority. Assign homework to the students and give them control over how each lesson is structured. Experiences show that adopting such a methodology not only increases the burden on students' self-motivation, but ,when effectively guided, student participation can enrich the course by introducing novel ideas that may not have been considered by the instructor. It is important to emphasize to students that they are active producers of knowledge as well as passive consumers of it.

Students should actively engage in both the preparation and execution of class activities. They should not only focus on

acquiring knowledge from the lecturer and their peers, but also actively seek opportunities to gain knowledge through extracurricular activities.

Šanca (2018, P.66) points out that since the translation industry is ever-changing, it is not feasible to give students knowledge from the future. Because of this, educators should emphasize self-learning to students and emphasize that learning never ends with graduation or as Henter wrote "our education is not finished when we finish school" (2016,P.58). The curriculum, accordingly, should promote "the self-organization of skills and knowledge from the simple to the complex and from teacher-centred instruction to highly autonomous learning" (Kiraly, 2016 P.140).

It is natural that certain students may struggle to adapt themselves to this strategy, as it necessitates a significant degree of self-motivation and a profound need for knowledge. Although the lecturer should make every effort to sufficiently prepare students for their future professions, it is not necessary for him to transform chronic idlers into active businessmen like a magician. The objective of lectures should not be to ensure universal graduation. Šanca (2018, P. 43) expounds that:

> *the CAT tools help exactly this approach to be established within courses. With these tools, one can set up a real business resembling environment, in which students take up roles from a simulated translation workflow, thus moving the learning emphasis on them. Cloud-tools then allow the students to work on their assignments from any computer with Internet connection, which means that they can chose the time to complete their assignments.*

Project-based learning

Just as real-world assignments are project-based, so too should academic projects be. It is essential to train students in a similar manner if one is to get them ready for the workforce. The aforementioned technique is not appropriate for courses that are grounded in theoretical principles. Therefore, it should not be universally implemented. It is important to recognize that certain courses necessitate a pedagogical method which focuses on rote learning and repetition. On the other hand, because project-based learning provides an easy method to modify or reorganize the course materials while on the go, it is deemed for CAT tool and project management training. Projects facilitate a modular approach that not only enables easy adaptation to the present circumstances but also enhances student's engagement in academic courses. If the project workflow is organized similarly to that of translation agencies, wherein tasks and responsibilities are divided among students, it will foster interdependence among students and reinforces their sense of being integral to the whole process. Students are more inclined to engage in cooperative and responsible behavior when their actions and decisions have an impact on their peers.

In order to assign roles to students during the course, Šanca (2018, P. 67) recommends that the lecturer set up multiple shorter projects. By implementing this approach, the instructor enables students to demonstrate their strong sides more fairly. Additionally, this method allows for a more accurate assessment of student performance compared to relying just on a single project to evaluate their work.

Overall, the project-based approach provides a highly adaptable, student-centered, accurately assessable, and fair setting that is similar to real-world practice (ibid.).

Situated translation

This module holds significant importance. Translation is never done in a bubble, cut off from the outside world. Conversely, it has always a purpose, the original and target audiences, the culture and setting, the ordering party, the desired effect, the quality standard, the required terminology usage, the deadline, the price, etc.

Since is critical that students receive training in an environment similar to the one they will be working in, translation projects utilized in university curricula for future professionals should be no different. Development of many competences a translator should possess is superfluously neglected if the translation assignment's only "reference material" is to "translate this until next week and you'll receive good marks." Indeed, this strategy primarily focuses on the development of linguistic competence.

When designing a translation task for our students, it is important to construct simulated surroundings to enhance the learning experience. Students ought to be informed about the following: who will read their translations, how the assignment will affect them, how much money they will receive, what terms to use, whether a proofreader will review their work, etc. This situationalisation immediately provides students with the necessary skills and knowledge for their future career, extending beyond language and translation skills. Bowker (2015) states:

> *Under such realistic conditions, students work and build knowledge and skills in a collaborative fashion, thus taking on the role of active learners, rather than passive receivers of potentially abstract and decontextualized knowledge, which may appear divorced from real world requirements or practices. The challenge for translator*

educators is to establish a framework that will support the embedding of technologies into – and especially across – translator education programs. (p.97) (in Sin Wai Chan)

Computer- relevant competence

Three well-known models of translation TC's sub-competences were described in the previous discussion. One aspect, pertaining to tools and technology, has been demonstrated to be nearly identical across all three models. Given that all the skills encompassed within this sub-competence pertain to computer-related activities, it is appropriate to adopt Kiraly's (2000) notion and designate them as "translator-relevant computer competence." Kiraly (2000, p. 125) says that “the goal [of the translator training process] would be to make sure that students acquire the objectively identifiable set of sub-skills that together comprise translator-relevant computer competence, which they should be able to apply to real translation tasks once they leave the institution.” All of the aforementioned models concur on the significance of computer skills. According to Kiraly (٢٠٠٠), in exceptional circumstances, a teacher has the ability to choose impart skills that they deem necessary, with a predominant focus on practical abilities related to computer hardware and software. Naturally, the utilization of a solely technology method may not be deemed appropriate within the context of a comprehensive translation course curriculum. Nevertheless, it demonstrates that technology should not be overlooked because it plays a significant role in a translation trainee's overall success.

As observed by EnríquezRaído and Austermühl (2003, p. 228), “today, translators ,find themselves in a diversified automated, and highly professional working environment. As

experts for intercultural technical communication, modern translators often double as technical writers, lexicographers, software testers, or cultural consultants."

The capacity to interact with the computer has emerged as a crucial element of the translator's skill set. In light of the current state of translation practices, which heavily rely on computer technology, it is common to encounter various technical challenges. The role of a translator frequently entails dealing with a range of technical challenges, such as system failures, program installations, Internet connection problems, software incompatibilities, and similar obstacles. When encountering difficulties throughout the translation process that impede task completion, some translators may experience feelings of frustration. The capacity to engage with technology and confront technological challenges is a recognized aspect of translation proficiency, which is acknowledged and examined in several models of translator competence, albeit referred to by different terminology.

This model of technological competence for translators includes the skills that student and freelance translators need to work as widely defined language service providers. For that reason, this list is neither complete nor clear though it is useful. Not all translators need all of these skills. Because modern interpreters have different ways of working, they also use CAT tools in different ways.

Integrating CAT tools into translation curriculum

Sin-wai (2010) argues that the academic institutions are "possibly the best places to acquire the knowledge and skills of computer-aided translation" (p.85) because of the opportunity that they offer to combine in-depth study with the practical experience from internships or "projects in a real-life setting" (p.86).

In line with Sin-wai's thesis, the researcher aims to provide a comprehensive syllabus for an introductory CAT course at the undergraduate level. This syllabus will include the translation tools and materials that were previously described. This course has specifically utilized versatile tools that can be implemented on home computers or in academic institution laboratories.

It is widely recognized that courses on translation technology are a crucial part of the translation curriculum. However, there are only a few course suggestions in the literature that focus specifically on technical expertise. Duoxiu (2010) presented a course design that is closely connected to CAT and covers topics such as TMs, bilingual alignment, terminology management, corpora, and MT. In 2010, Xuejuan suggested implementing a CAT course specifically designed for undergraduate students, with a focus on English majors. Doherty and Kenny (2014) introduced a novel design and evaluation of a statistical MT course with at Dublin City University. Wong (2015) focused on a hands-on, practical learning method with interactive involvement, and he briefly reviewed the theoretical foundations and curriculum design for an elective course on CAT tools. Rodríguez-Castro (2018) developed a graduate-level course that introduced students to CAT tools and their various functions. The course had a well-designed curriculum with specific learning objectives. Additionally, the course incorporated Virtual Reality Simulation (VRS) and task-based learning as teaching methods.

Marchenko and Kolobkova (2020) introduced a set of training principles and focal skills, along with several modes of assessment, to evaluate the training process, students' performance, and the level of proficiency in CAT operating abilities. The researchers examined the difficulties associated with implementing computer translation technology in education and suggested strategies to address these obstacles. Liu (2014) developed training modules for the implementation of CAT in an MA course at The Chinese University of Hong Kong. Liu covered the topic of teaching CAT system usage in a step-by-step way in the classroom, starting with fundamental functions and working up to more complex processes.

In general, the courses mentioned above include extensive curricula and innovative pedagogical approaches. Nevertheless, these courses offer a restricted analysis of assessing learning outcomes and the relationship between the education process and the profession skillsthat students would acquire. Therefore, the aim of this study is to bridge a gap in teaching translation technology by proposing learning outcomes that not only facilitate the rapid advancement of technical skills, but can also be assessed both directly and indirectly, enabling prompt intervention during the first steps of CAT course.

According to PACTE's TC framework, students first acquire the declarative information required for translation during their learning process. As a result, translation learners start to develop instrumental competence and gain both declarative and procedural knowledge, which assists them in overcoming translation challenges.

The curriculum in question incorporates both professional and technical abilities, and the translator instrumental sub-

competence is assessed according to the learning outcomes of the course.

The learning outcomes of the course examined in this research are original and have been identified through an extensive literature review in the field of translation studies. These outcomes are linked to the course material and align with industry standards. Furthermore, they demonstrate skill development that is assessed directly and is consistent with portfolio assignments.

In response to industry demands for a higher degree of technical proficiency in the translation profession, the course design prioritises a methodology that emphasises practical applications. Task-based learning allows for the incorporation of activities within professional contexts, simulating translation projects to increase student involvement. The course presents theoretical concepts that are demonstrated and obtained through practical laboratory sessions. These sessions involve solving problems that encourage the development of higher-order metacognitive skills (Shreve, 2002). Additionally, the course aims to gradually build declarative knowledge, which is essential for comprehending and performing translation tasks, ultimately leading to the development of procedural knowledge (ibid.; Shreve and Angelone, 2010).

The aim of this course design is to provide students with an extensive array of tools that are extensively employed within the industry. This will enable them to further develop their technical expertise and be well-prepared for prospective job opportunities in the translation market. The study investigates the technically-relevant learning outcomes by directly analysing the preliminary data obtained from student assignments. Additionally, these outcomes are indirectly evaluated through in-class student

assessments. The following sections provide a detailed discussion of the direct and indirect assessment outcomes.

Course description and teaching methodology

This course offers a brief overview of the theoretical principles in each subject, with a main focus on developing technical expertise. As far as the practical sessions are concerned, the application of CAT tools course entails the availability of good infrastructure in a form computer lab that meet the requirements of the software functionalities. The course is designed to the 4th-year students who should be well prepared to study and implement the course requirements. In other words, they should be computer-literate and have good knowledge in dealing with computers. the implementation of CAT instruction in translation classes dictates educators to possess the necessary practical skills in utilising CAT tools. It is important for universities to prioritize the pre-service and in-service training of teachers, with a particular emphasis on computer-based multimedia and network technology. Additionally, universities should consider engaging experts in the field of CAT technology to oversee and provide guidance for the practical classroom instruction of inexperienced teachers (Erwen and Wenming,2013,P.18).

The course commences with a comprehensive study of the translation process. Throughout a project, students are expected to apply a problem-solving process and use the best tool available. The course is structured as a 3-credit course, with classes held twice a week over 30 weeks (two semesters).

Task-based learning is acknowledged as "a predominant teaching methodology in translator education" (González Davies, 2004; Hurtado Albir, 2007) that 'fosters the integration of not only tasks, but also context identification and analysis, the selection of

contents, and evaluation' (Rodríguez-Inés and Hurtado, 2012, p. 99). By using open-ended projects and translation practice, this method supports active learning (Li, 2013), and is favored due to its adaptability in enabling the execution of a series of tasks in stages (Passos De Oliveira, 2004, p. 256) that enable 'a sound establishment of objectives, a structured design, clear sequencing of teaching units, reflection and an evaluation of the teaching and learning objectives' (Mitchell-Schuitevoerder, 2010, p. 132). Additionally, the instructor might design a scenario that is focused on the students and emulates professional activity. In this class, the teacher shows and explains a step-by-step process, and then the students repeat the process with more hands-on activities and explanations.

The weekly laboratory projects are an essential element of the course as they facilitate rapid comprehension of the material through practical application, foster increased student involvement, and provide a dynamic environment that promotes activities like team building. Lab assignments come with a detailed explanation of the process at the start of the session, and students are required to submit the completed assignment by the end of the session.

The CAT tools class is distinct from traditional courses that focus on translation theory or practice. This course is considered independent and does not have any mandatory prerequisites. However, it is assumed that all students enrolled in this course are proficient in using computers and have an adequate knowledge of computer fundamentals. All students possess the linguistic pair English and Arabic, and have achieved undergraduate status while completing the same fundamental courses in translation studies. Given its primary emphasis on the technical components of translation, this course is a challenge for students due to its high

level of technical specialisation and the complexity of the tasks involved.

The Textbook suggested for this course is *Translation Tools and Technologies* by Andrew Rothwell, Joss Moorkens, María Fernández-Parra, Joanna Drugan, and Frank Austermuehl. The book was published in 2023 by Routledge.

This cutting-edge illustrated textbook provides a clear and useful introduction to translation techniques and systems. The book is useful for translation students and established professionals alike.The book provides a comprehensive explanation of how CAT and MT technologies function. It offers precise instructions on selecting appropriate tools, whether they are free or paid, and efficiently familiarizing oneself with them. The book includes examples from many languages to illustrate the concepts. Translation students will find this resource extremely beneficial for the purpose of establishing or improving their curriculum. This distinctive book encompasses a wide range of subjects in addition to text translation; these include the study of the technological advancements, project management, terminology and corpora, localisation of websites, software, and games, and the topic of quality assurance. The narrative focuses on professional procedures and also addresses the ethical and legal concerns that arise when translation data is reused.

This textbook is indispensable for all translation studies and translation education courses, as it provides users with specific recommendations for further reading at the end of each chapter to help them enhance their understanding and expertise in translation and technology.

4-3-2 Course modules and content layout

The CAT tools course layout is explained in this part. As shown in Table 2, the course is comprised of 11 major modules. Each module is dedicated to a certain aspect of translation technology. The content has been arranged in chronological order, with the level of work complexity increasing equally. The localization project is considered the most challenging assignment of the semester. It is important to mention that the material distribution can be arranged in a different way.

No. of Module	Timeline (week)	Modules	Description
1	1	Introducing Translation Tools and Technologies	• Why is translation challenging, for humans and for machines? • What are the main types of computerised tools? • What are the main differences between machine translation (MT) and computer-assisted translation (CAT)? • What is the history of these tools?
	2		
2	3	Principles of Computer-Assisted Translation (CAT)	• What are CAT tools and how do they work? • What are a CAT tool's main components? • What advantages and disadvantages do different architectures present? • What are some major current issues to be aware of when you use CAT tools?
	4		
	5		
3	6	Translation Memory, Matching, Alignment, and Data exchange	• Translation memories , Bilingual, • Alignment and bi-texts
	7		

	8		
4	9	Managing Terminology in CAT Tools	• The prescribed procedure of handling terminological data and the creating of a glossary. • Input models and term formation.
	10		
5	11	Electronic Corpora	• What is a parallel text? • What is a corpus? • What is a concordancer and what does it do?
	12		
	13		
6	14	Current Machine Translation Technologies	• What are the main types of machine translation? • How does neural machine translation work? • How can translators use machine translation?
	15		

Table 2. *The suggested syllabus (1st Semester)*

The course begins with an introductory module on translation tools and technologies used to assist translators to achieve the translation task and the main differences between MT and CAT tools. The course then presents the features and general review of CAT tools and the main components of these tools. The tools advantages and disadvantages are also presented in this module. The course proceeds to explain the TM, matching, alignment, data exchange using CAT tools. In this module on translation memory tools, students will learn a systematic process that includes the following steps:

i. Bilingual alignment using the Alignment Tool in memoQ;
ii. Creating a new TM;
iii. Adding bilingual segments to TM; and

iv. Sharing TMs with team members.

The fourth module (weeks 9 and 10) tackles terminology management, glossary creation, concept - based modelling, term formation, and data category selection. The fifth module (weeks 11-13) presents electronic corpora. The definition and types of corpora and concordance are investigated in this module. The sixth module and last module in the first semester (weeks 14 and 15) reviews the main types and approaches of MT and how can translators use these tools to achieve his/her task.

The second semester begins with the seventh module (weeks 16-18) that addresses the strengths and weaknesses of MT using (Google Translate™) and the importance of post-editing and proofreading in this process. The eighth module (weeks 19-21) presents the concept of Translation Management System (TMS) and how TMS differs from a standard CAT tool. The module also addresses project workflow management from the perspective of both the translator and project manager. Students are provided with a comprehensive introduction to the industry and those who are most engaged in the communication process, such as the client, project manager, and team members. The ninth module (weeks 22-24) covers localisation and how it differs from translation. The types of localisation and the difference between software and game localisation are also discussed in this module. The tenth module (weeks 25-27) tackles Translation Quality Assurance (TQA) and the importance of TQA when translation technologies and tools are used. The main tools and technologies which aim to measure or enhance TQA are also discussed in this module. The eleventh and last module (weeks 28-30) explores the human factors that might affect how you work with translation tools, the physical constraints that might prevent you from working

efficiently, and the intentions of developers might change how you work within a tool.

No. of Module	Timeline (week)	Modules	Description
7	16	Post-editing	• The strengths and disadvantages of MT, specifically Google Translate™. • The recommended methods for post-editing MT output and reviewing Google Translate™ output.
	17		
	18		
8	19	Translation Project Management	• What is a translation management system (TMS)? • How does a TMS differ from a standard CAT tool? • How does a modern TMS exploit cloud-based architectures? • How does it support project managers? • How do translators interact with the project manager and reviser in a TMS?
	20		
	21		
9	22	Software, Web, and Game Localisation	• What is localisation and how does it differ from translation? • What types of localisation are there? • What is the difference between software and game localisation? • Can we use a CAT tool for a localisation project?
	23		
	24		
10	25	Translation Quality Assurance	• What is translation quality?

	26		• Why is it important to consider quality when we use translation tools and technologies? • What are the main tools and technologies which aim to measure or enhance translation quality?
	27		
11	28	Human Factors in Translation Tools and Technologies	• What are human factors and how might they affect how you work with translation tools? • What physical constraints might prevent you from working efficiently? • How might the intentions of developers change how you work within a tool? • What organisational factors might motivate translators?
	29		
	30		

Table 3. *The suggested syllabus (2nd Semester)*

In addition to the in-class laboratory assignment, students are required to present a portfolio consisting of five assignments that are closely connected to the content-related tasks covered in the module. The list of the assignments can be organised as those in Table 4. These assignments are ordered in correspondence to the syllabus topics and complexity.

Assignment 1	Translation memory
Assignment 2	Termbase development
Assignment 3	Translating an instruction manual
Assignment 4	Post-editing assignment
Assignment 5	Localising assignment

Table 4. *Assignments*

On the course content management system (forum, Padlet), the instructor offers extra assistance to the students while they work on these assignments. When it comes to the technical nuances of the task, students can collaborate, share answers, and ask questions. For each assignment, a file must be submitted.

However, the localisation project is an exception. In addition to the file submission, students are also required to submit a reflection essay. This essay should demonstrate critical thinking skills by explaining and justifying important theoretical concepts. These justifications should be supported by references.

Learning outcomes and assessment

The following is a list of the identified learning objectives for the CAT course. By the end of the semester, students will be able to:

(i) Identify and tackling translation and localisation problems by using CAT tools and corpora;

(ii) Apply TMs, terminology management, and corpora to the translation and localisation;

(iii) Edit, proofread, and post-edit bilingual texts;
(iv) Work effectively and communicate with others in a team; and
(v) Recognise the importance of lifelong learning.

These learning outcomes can be primarily evaluated through five assignments, which include a course portfolio and practical work in laboratory. A process-based technique can be used to undertake an initial direct measurement of the learning outcomes for assignments 1, 2, and 3. Assignment 4 can be assessed using a product-based approach. A distinct rubric can be developed for each assignment to evaluate the final outcome in relation to both the process of translation and the final target text. The product-based approach involves evaluating several aspects of the text, such as proficient formatting elements, spelling and grammatical problems, punctuation, cohesion, consistent using of terms, text-type linguistic features, and linguistic ambiguity (see Rodríguez-Castro and Sullivan, 2015).

Several assignments and tasks can be used to evaluate how well the learning outcomes are being met. It is possible to evaluate learning outcome (i) using all of the student work. In each task, students must recognise a wide range of technical issues and determine the best solutions.

Assessment of learning outcome (ii) can be done by completing the following assignments: constructing a TM, creating a termbase, and translating an instruction manual (Figure 7). Students may be asked to localise a website as part of the localisation project.

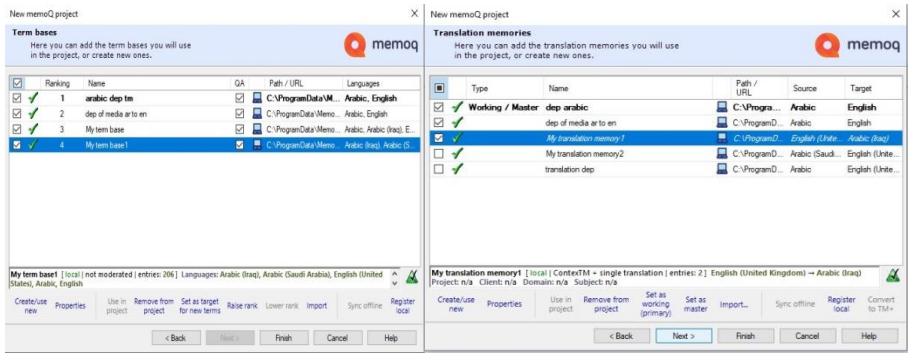

Figure 7. *Creating TM and TermBase in MemoQ*

Learning outcome (iii) can be assessed from assignments 3 and 4. For assignment 3, students can be asked to use any CAT tool to achieve the task. Figure 8 illustrates a task completed by a sample group to collect and translate the Arabic news of the College of Arts 10 departments from Mustansiriyah University official website by using memoQ's CAT tools.

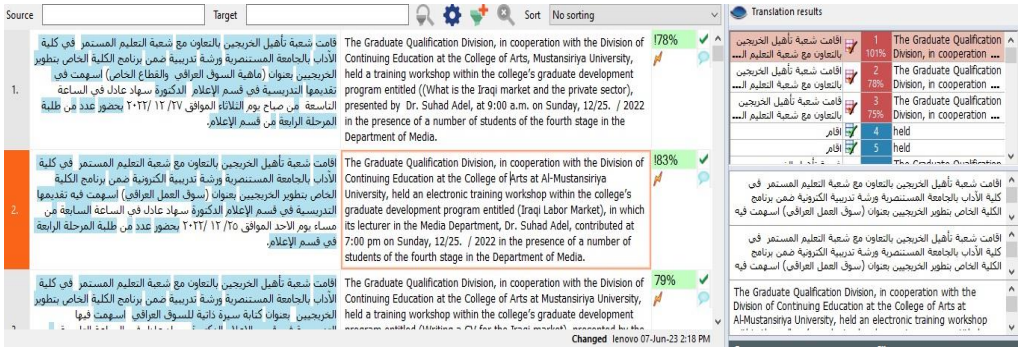

Figure 8. *A translation task by using memoQ*

Thus, in a standard translation task, students are required to generate a translation document that adheres to the guidelines of the client, thereby developing their word editing abilities. They must also engage in terminology search activities, establish a term base, employ a CAT to translate the text, construct a TM, and ultimately provide the final revised rendition of their translation. Furthermore, a substantial portion of the translation task involves

terminology work, which necessitates the students' acquisition of efficient and critical utilisation of diverse sources of terminological information. These sources encompass electronic and Internet dictionaries such as PWN-Oxford, Cambridge, Oxford, Longman, as well as translation search engines like Linguee.

For assignment 4, students can be asked to use different MTs to compare the output translation and the post-editing processes resulting from such MTs. The program's specific exercises comprise an overview of MT platforms (e.g., Google Translate, Bing), as well as an explanation of the constraints associated with their use. The objective of this overview is to illustrate to the students the limitations of these online tools, dispel the prevailing misconceptions regarding their efficacy as cost-effective and efficient translation aids, and instill in students an understanding that proofreading and post-editing are integral stages of the translation process.

Learning outcomes (iv) and (v) can be measured using the localization assignment. In contrast to the previous tasks, the localisation project can be accomplished by groups of three students who each have the appropriate individual skills for achieving the task.

Regarding learning outcome (v), students acknowledged that participating in continuous learning is essential in a translation profession to maintain competitiveness. Students also acknowledged the necessity of consistently enhancing their communication abilities in order to thrive in a translation profession.

Conclusion

The study investigated the problem of teaching translation technology in the Iraqi translation programmes. These programmes lack using translation technologies and tools in the translation education though world and regional universities have made significant steps towards using these technologies and tools in the educational and professional institutions. The researcher endeavoured to answer the researcher question regarding this study, namely the applicability of teaching CAT tools in the Iraqi translation programmes and the students' and institutions' readiness to apply such tools. This experimental study supports the integration of translation technology in general and CAT tools in particular into the Iraqi translation programme provided that students and institutions respond to major changes in the education system as a whole.

The study found out that translation students who can deal with computers and operating systems are well prepared to study CAT. This preparation is conditioned with providing the institutions with laboratories infrastructure such as computers and software required for teaching CAT tools. In a similar vein, students need to study computer in the first two years at the university education to grasp the basics of computer and operating systems and prepare them to study CAT tools.

The contribution of the present study is represented in introducing a detailed map for integrating CAT tools into Iraqi translation departments taking into consideration the educational institutions infrastructure possibilities and the Iraqi students' capacities.

References

- Doherty, S., and D. Kenny. (2014). The Design and Evaluation of a Statistical Machine Translation Syllabus for Translation Students. *The Interpreter and Translator Trainer* 8 (2): 295–315. doi:10.1080/1750399X.2014.937571.
- Duoxiu, Q. (2010). Pedagogical Reflections on the Design of a Computer-Aided Translation as a Course. *Journal of Translation Studies 13* (1&2): 13–26.
- EMT Expert Group (2009). *Competences for professional translators, experts in multilingual and multimedia communication*. Available at: https://ec.europa.eu/info/sites/info/files/emt_competences_translators_en.pdf
- EMT Expert Group (2017). *European master's in translation competence framework*. https://ec.europa.eu/info/sites/info/files/emt_competence_fwk_2017_en_web.pdf
- Erwen, Z., &Wenming, Z. (2013). Application of Computer-Aided Translation Technology in Translation Teaching. *International Journal of Emerging Technologies in Learning (iJET)*, 8(5), pp. 15–20. https://doi.org/10.3991/ijet.v8i5.2926
- Garcia, I. (2015). Computer-aided Translation Systems. In *Routledge Encyclopedia of Translation Technology*, 68-87. Routledge.
- González Davies, M. 2004. *Multiple Voices in the Translation Classroom: Activities, Tasks and Projects*. John Benjamins Publishing.
- Göpferich, S. (2009). Towards a model of translation competence and its acquisition: The longitudinal study TransComp. In S. Göpferich, A. L. Jakobsen, & I. M. Mees (Eds.), *Behind the mind: Methods, models & results in translation process research* (pp. 11-38). CSL – Copenhagen Studies in Language.
- Henter, Sarah.(2016). How Happy Are Translators with Their Studies? In: *Current Trends in Translation Teaching and*

Learning E [online]. Helsinki: University of Helsinki, 3(1). ISSN 2342-7205. P. 58. Available at:http://www.cttl.org/uploads/5/2/4/3/5243866/cttl_e_henter.pdf

- Hurtado Albir, A. (2017a). Translation and translation competence. In A. HurtadoAlbir (Ed.), *Researching translation competence by PACTE group* (pp. 3-33). John Benjamins Publishing Co. doi.org/10.1075/btl.127.01hur
- Hurtado Albir, A. (Ed.). (2017b). *Researching translation competence by PACTE group*. John Benjamins Publishing Co. https://doi.org/10.1075/btl.127
- Kiraly, D. (2000): *A Social Constructivist Approach to Translator Education; Empowerment from Theory to Practice*. St. Jerome Publishing.
- Kiraly, D. (٢٠١٦). Occasioning translator competence: Moving beyond social constructivism toward a postmodern alternative to instructionism. *TranslationandInterpretingStudies*, 10(1), 8-32. https://doi.org/10.1075/tis.10.1.02kir
- Kornacki, M.(2018) Computer-assisted Translation (CAT) Tools in the Translator Training Process. Peter Lang.
- Li, D. (2013). Teaching Business Translation. *The Interpreter and Translator Trainer 7* (1): 1–26. doi:10.1080/13556509.2013.10798841.
- Liu, J. (2014). Task-based teaching of computer-aided translation in a progressive manner. *TC*.
- Marchenko, T. & Kolobkova, A.(2020). Design and implementation of a CAT training course. *CEUR*. Vol-2861, paper 38.
- Mitchell-Schuitevoerder, R. (2010). A Project-Based Methodology in Translator Training. In *Tracks and Treks in Translation Studies: Selected Papers from the EST Congress*, edited by C. Way, S. Vandepitte, R. Meylaerts, and M. Bartlomiejczyk, 127–142.

- PACTE (2000): Acquiring Translation Competence: Hypotheses and Methodological Problems of a Research Project, in A. Beeby, D. Ensinger, M. Presas (eds.). *Investigating Translation*. John Benjamins Publishing.
- PACTE. (2003). Building a translation competence model. In F. Alves (Ed.), *Triangulating translation: Perspectives in process oriented research* (pp. 43-66). John Benjamins Publishing. https://doi.org/10.1075/btl.45.06pac
- PACTE. (2017). PACTE translation competence model: A holistic, dynamic model of translation competence. In A. HurtadoAlbir (Ed.), *Researching translation competence by PACTE group* (pp. 35-42). John Benjamins Publishing Co. https://doi.org/10.1075/btl.127.02pac
- Passos De Oliveira, C. (2004). Implementing Task-Based Assessment in a TEFL Environment. In *Task-Based Instruction in Foreign Language Education: Practices and Programs*, edited by B. L. Leaver and J. R. Willis, 253–279. Georgetown University Press.
- Rodríguez-Castro, M. (2018): An integrated curricular design for computer-assisted translation tools: developing technical expertise, *The Interpreter and Translator Trainer*, 12(4), 355–374. DOI: 10.1080/1750399X.2018.1502007
- Rodríguez-Inés, P., and A. Hurtado.(2012). Global Trends in Translator and Interpreter Training: Mediation and Culture. In *Assessing Competence in Using Electronic Corpora in Translator Training*, edited by S. Hubscher-Davidson and M. Borodo, 96–126. London: Continuum.
- Rothwell, A., Moorkens, J., Fernández-Parra, M., Drugan, J., & Austermuehl, F. (2023). *Translation Tools and Technologies* (1st ed.). Routledge. https://doi.org/10.4324/9781003160793
- Salamah, D. (2021). Translation competence and translator training: a review, *International Journal of Linguistics, Literature and Translation*, Vol. 4 No. 3, pp. 276-291, DOI: 10.32996/ijllt.2021.4.3.29

- Šanca, F. (2018). *The Use of CAT Tools in University Translation Courses: A Case Study Based on Teaching with Memsource*. Unpublished Master's thesis. Charles University, Faculty of Arts, Prague.
- Shreve, G. M. (2002). Knowing Translation: Cognitive and Experiential Aspects of Translation Expertise from the Perspective of Expertise Studies. In *Translation Studies. Perspectives on an Emerging Discipline*, edited by A. Riccardi, 150–171. Cambridge: Cambridge University Press.
- Shreve, G. M., and E. Angelone. (2010). *Translation and Cognition.* John Benjamins Publishing.
- Sin-wai, C. (2010). A New Curriculum for the Teaching of Translation Technology: The Teaching of a Translation Project Course as a Case Study. *Journal of Translation Studies*, *13*(1-2), 83–154.
- Sultan, A. (2007). *A Social Constructivist Model for Assessing Student's Translations*, Unpublished Ph.D. Thesis Al-Mustansiriya University.
- Wong, C. (2015). The Teaching of Machine Translation. The Chinese University of Hong Kong as a Case Study. In *Routledge Encyclopedia of Translation Technology*, edited by C. Sin-Wai, 237–251. Routledge.
- Xuejuan, L. (2010). The Course Design of CAT for Undergraduate English Major of Sun Yat-Sen University. *Journal of Translation Studies 13* (1 & 2): 251–272.