Psycholinguistic and Technohumanistic Aspects of Translator and Interpreter Training

Monograph

Leonid Chernovaty
Natalia Kovalchuk

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Authors: Leonid Chernovaty, Natalia Kovalchuk

Reviewers:
Prof. Olena Panchenko, DrSc (Oles Honchar Dnipro National University)
Prof. Kateryna Skyba, DrSc (Khmelnytskyi National University)

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Alex Millington

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*Transliterating from Ukrainian has been carried out according to the current norms through the programme http://www.ukrlit.org

PREFACE

This monograph examines issues related to the development of translators' professional competence in higher education institutions and is offered to interested readers.

As is well known, all learning should be based on a psychological model of the desired outcome. Consequently, the first part of the monograph explores the psychological and psycholinguistic dimensions of developing and exercising professional competence in translation.

In particular, analysing the dynamics of translation ability development in early bilingualism (Chapter 1) enabled us to formulate assumptions about this ability's innate nature, as well as the relationship between translation strategies, the dynamics of their changes, and the affecting factors. In addition to contributing to the theory of translation teaching methodology, the obtained data have undeniable practical significance and may be considered when designing the content and methodology of teaching future translators.

When developing effective teaching methods, it is important to consider the sources of difficulties that arise during translation and the strategies for overcoming them. This allows both to be taken into account when designing appropriate exercises and tasks. Analysis of this problem (see Chapter 2) revealed at least four sources of difficulty (variations in the principles of terminology composition in the two languages; interlanguage and intralanguage interference; a deficit of background and/or subject knowledge) and seven strategies for overcoming them (transcoding; literal translation; associational expansion; logical inference; contextual deduction; improvisation; and withdrawal). These lists provide a good basis for further experimental research and the development of teaching materials and teaching methods.

A comparative psychological analysis of translation and interpreting processes (Chapter 3) convincingly demonstrated their fundamental differences, which should be taken into account in the learning process. The results suggest that an individual's processing capacity is rarely overloaded in translation due to the discrete nature of this type of mediation. Consequently, the efforts involved in source text reception, analysis, decision-making, and target text delivery are applied sequentially. Consequently, the available processing capacity is usually

sufficient to produce a target text of acceptable quality. By contrast, interpreters must simultaneously perceive, analyse and translate the source text, which results in significant overload and requires considerable short-term memory effort. All of these differences between translation and interpreting should be considered when planning and teaching them.

The analysis of the sight translation process allowed us to assume that the structure of the source text influences the structure and quality of the target text (chapter 4) regardless of the source language. The dependence of the translation strategy on the aforementioned structure turned out to be much more pronounced than on the source language. These conclusions have certain implications for translator training. To develop students' awareness of translation strategies, the conditions and specifics of their application, the authors suggest including into the training programme source texts of different syntactic structures. They assume it could contribute to the automation of the relevant operations,

The second part of the monograph examines topical issues of human-technology coexistence using the example of online translation training in Ukrainian higher education institutions.

Having considered the general aspects of the problem of coexistence of humans and technologies using the example of technohumanism theory (chapter 5) and analysed the practice of hidden use of machine translation by students in online learning (chapter 6), the authors express concern about the prospects of increasing student dependence on technological tools and a decline in their human translation competence.

In search of solutions to this problem, the authors analyse ways to improve the system for monitoring students' independence when completing homework and test assignments (Chapter 7) and explore the potential of post-editing to stimulate intellectual activity and encourage a critical approach to target texts, especially when addressing terminology issues (Chapter 8). Chapter 9 analyses the influence of subject knowledge on translation quality, particularly with regard to the acquisition and use of specialised terminology, as well as ways to ensure the effective acquisition of such knowledge. Chapter 10 deals with ways to overcome students' stereotypes regarding the superiority of machine translation programmes over humans and to encourage a critical attitude towards the products of such translation.

The authors emphasise that they do not oppose the use of technological tools by translators. Instead, they advocate the harmonious development of the human and technological components of professional translation competence. They also express their firm conviction that such harmony can be achieved through further research in this field.

Leonid Chernovaty

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LIST OF ABBREVIATIONS

DLT – DeepL Translate MT software
ICT – information and communication technology
MA – Master of Arts
MST – Microsoft Translate MT software
MT – machine translation
MTPE – post-editing of machine-translated texts
NMT – neural machine translation
P – participant
SensOS – sense-oriented strategy
SiT – sight translation
SMT – statistical machine translation
ST – source text
STS – source text size
SurfOS – surface-oriented strategy
TAP – Think-Aloud Protocol
TT – target text
TTS – target text size

PART 1

PSYCHOLINGUISTIC ASPECTS OF TRANSLATOR AND INTERPRETER TRAINING

CHAPTER 1
DEVELOPMENTAL DIMENSIONS OF TRANSLATION CAPACITY ACQUISITION

1.1. Introduction

In this chapter, the term *translation* is used generically to refer to both translation and interpreting. From a psychological point of view, the development of translation competence (PACTE, 2003; Göpferich, 2009; Kiraly, 2013; European Commission, 2017) or translation expertise (Shreve, 2006) is believed to be the result of the cognitive changes that deliberate practice brings about in the brain of the translator. It is assumed that such practice results in changes to the individual's mind. These changes include a significant expansion of episodic memory and the development of algorithms for recognising content representation models specific to a given field. The meaning of these models may differ from one field to another.

Other changes may relate to the assignment of certain translation algorithms (techniques) to each of these models for conveying their content, or the ways in which professional translators (compared to novices) represent or segment problems at higher levels of abstraction or according to other principles. Another consequence may be the development of a neural network in long-term memory related to algorithms for solving translation problems, ensuring optimal access to this network during the translation process. All of these changes are associated with the gradual automation of certain lower-level translation activities, resulting in control over their performance shifting to the periphery of consciousness.

If such automation occurs during formal training, when students are initially provided with information about the conditions and guidelines for performing certain actions, this process involves the gradual replacement of declarative knowledge with procedural knowledge. When developing translation competence exclusively through deliberate practice, procedural knowledge is formed during this practice, and students may experience difficulties converting it into declarative knowledge. In both cases, once they reach a professional level, translators begin to work more efficiently without any noticeable signs of difficulty.

1.2. Review of previous research

This process seems worthy of further study. In particular, as Shreve (2006) notes, an interesting issue is the dynamics of the automation of translation techniques – the nomenclature of which is described in translation studies (see below) – in the development of translation competence. In other words, a number of aspects need to be investigated. For example, which strategy (literal or semantic translation) do bilinguals use when learning to translate? Do professional and student translators use the techniques described in translation studies in their work, and if so, to what extent? Specifically, calquing can be seen as evidence of the literal translation strategy and contextual substitution and transformations (permutation, addition, deletion, etc.) as signs of the sense-oriented strategy.

In general, the psychological processes underlying the development and functioning of translation competence appear to have received insufficient research attention. According to Treffers-Daller (1998), the psycholinguistic features of its development have been studied far less than the syntactic aspects of the translation process, for example. Often, such studies lack material and, consequently, some of them (see, for example, Harris & Sherwood, 1978) have to rely on research dating back to the first half of the last century (Ronjat, 1913; Leopold, 1939).

Over the past fifteen years, a great deal of work has been published on analysing the translation process. In particular, general issues have been studied (Lörscher, 2005; Künzli, 2009; Sun, 2011; Annoni et al. , 2012; López & Martín, 2022), as well as translation tasks, the impact of experience on translation efficiency (Whyatt et al., 2023), the psychological structure of the translation process (Carl, Tonge & Lacruz, 2019) and the effect of information technology on its content (Temizoz & Gough, 2024; Ikrimah, Aslamiyah & Fauzan, 2024). However, the nature and dynamics of mastering translation techniques in the process of developing translation competence remain under-researched, which is why this study is relevant.

1.3. Research aim and participants

Thus, this study aimed to investigate the status of translation techniques in the development and functioning of translation competence. To ensure

the purity of the experiment, the translation activities of a three-year-seven-month-old male bilingual child were chosen as the research material (Chernovaty, 2014). The participant was a natural bilingual, having acquired two languages from birth: Language A (Russian), through communication with family members (excluding his mother), peers, and other adults; and Language B (English), through communication with his mother, peers, and other adults during his travels with her to the USA and UK, where she frequently went on business trips. Additionally, the participant regularly watched cartoons and listened to books in English read by his mother.

His command of English was consistent with that of native speakers of the same age. In particular, his speech exhibited characteristics typical of children acquiring English as a first language. For example, he regularly used the grammatical morpheme *did* (instead of the ending *-ed*) to mark the simple past tense: *He did open the door* instead of *He opened the door*. Such interim structures are often observed in the acquisition of English as a first language (Ingram, 1992).

This participant was an ideal choice for analysing his translation samples for several reasons. Firstly, his experience of bilingual communication was limited to oral interaction, since he could neither read nor write at the time of the experiment. This excluded any influence from information that the child could have obtained from written texts. Secondly, the child had no prior experience of translation and was observed to perceive languages not as systems of specific units used for communication, but rather as different forms of behaviour with different people. It is likely that he believed that everyone around him spoke the same two languages. This is evidenced by numerous cases of him attempting to communicate in the wrong language with others, particularly strangers. Thus, this participant's lack of translation experience and absence of external influences provided an excellent opportunity to observe his translation strategies and techniques, and the dynamics of his translation ability in general.

1.4. Translation techniques

Before analysing the participant's translation samples, it seems relevant to review existing classifications of translation techniques to determine whether and to what extent the participant uses them in his translations.

For the purposes of this chapter, we regard a translation technique as any operation performed on the source text to produce a target text. In our interpretation, this concept is generic and encompasses both techniques and transformations, which are treated as distinct categories in some other works (Karaban, 2004).

There is no consensus in translation studies on how to classify such techniques. The first systematic attempt at creating a typology of them is considered to be the work of Vinay and Darbelnet (1958), who proposed more than two dozen techniques and labelled them *translation procedures*. Some of these were self-explanatory, such as *literal translation*, while others, such as *discursive creation* and *modulation*, required additional explanation. Subsequently, other authors (Margot, 1979; Newmark, 1988; Molina & Albir, 2002; Fawcett, 2003; Karaban, 2004; Delisle, 2013) attempted to refine this classification system by introducing new labels to represent the same concepts, or by retaining the original labels but adjusting their scope. For instance, Margot's (1979) term *cultural equivalent* is replaced by *adaptation* in another classification (Molina & Albir, 2002). Instead of *explication* (Vinay & Darbelnet, 1958), alternative labels such as *paraphrase* (Margot, 1979), *explicative paraphrase* (Newmark, 1988), *addition* (Delisle, 2013) and *amplification* (Fawcett, 2003) are proposed.

To ensure clarity of understanding and avoid complicating the discussion with opaque terminology, the following list details the translation techniques analysed in this chapter. This list is based on an approach developed for scientific and technical translation (Karaban, 2004), with some modifications made for the purposes of this study.

Translation techniques can generally be grouped according to various criteria, but for this study, the most appropriate distinction is by level of application: single words or phrases.

The list of techniques for translating single-word lexical items is set out below.

The simplest translation technique – selecting an equivalent from a dictionary – is not applicable in this case, since the participant did not yet know how to read or use a dictionary, as previously mentioned. Therefore, we can talk about selecting an equivalent from the internal lexicon. This process is not observable, so we can only make assumptions based on the input and output.

Transcoding refers to the process of copying the form of a word in the source language. It is commonly associated with translation, but it can also occur in interpreting (see further). Therefore, we will briefly note that there are different types of transcoding, such as transcribing, which involves copying the sound form of a word (*design* – дизайн) into the target language (hereinafter the target language in the examples is Ukrainian). Transliteration involves copying the graphic form of a word (e.g. *London* – Лондон); mixed transcoding involves a combination of copying the sound and graphic forms of a word (e.g. *iPhone* – ай-фон); and adaptive transcoding involves transliterating part of a word and adapting the other part to the norms of the target language (*revolution* – революція).

Contextual substitution occurs when a word in the target language is used that is not listed in the dictionary as an equivalent of a word in the source language, but which best matches the context and meaning of the source language word in this case (*supreme performance* – найвища якість перекладу). There are various types of contextual substitution. One type is specification, where a semantically broader source word is replaced with a semantically narrower word in the target text. For example, *vocational aspect* – професійна підготовка. In this phrase, the word підготовка has a narrower semantics than the word *aspect*. However, if we rearrange the sentences of the source and target texts, we are dealing with generalisation: the replacement of a word with narrower semantics (підготовка) with a word of a broader semantics (*aspect*) in the target text.

Other cases of contextual substitution include antonymic translation, which involves replacing a source text lexical item with a form that lacks a negative particle (or vice versa), while preserving its meaning (*untrained bilingual* – природний білінгв); descriptive translation: a lexical unit in the source text is replaced in the target text by a phrase with more words that adequately conveys the meaning of the original lexical unit (доба – *twenty-four hours*). In the case of sense development, the meaning of the word used in the target text is a logical development of the meaning of the word being translated (*educated translators* – перекладачі з фундаментальною теоретичною підготовкою); change of part of speech – the target text uses a word that belongs to a different part of speech compared to the word in the source text (*mechanical engineer* – інженер-механік); word addition – the introduction of words into the target text that are not explicitly present in the

source text, but the corresponding meaning is implicit (*cultural immersion* – занурення в культурне середовище носіїв мови, що вивчається).

Ways of translating collocations include calquing, which involves copying the structure of a compound word or phrase, e.g., *bookcase* – книжкова шафа, *natural translation* – природний переклад); permutation involves using a different word order (*bilingual child* – дитина-білінгв), addition means adding a word (*intercultural expertise* – міжкультурні експертні знання), and deletion implies removing a word (*extensive language training* – додаткові заняття).

Sometimes several techniques are used concurrently: for example, permutation and addition (*pedagogical issue* – питання методики навчання); permutation and deletion (*domain-general control ability* – загальне уміння контролю); permutation, addition and deletion (*binding theory – теорія принципів і параметрів*), or (rarely) deletion and addition (*strengthening* by *means of associations – посилення асоціативних зв'язків*).

Unlike translation, interpreting is often characterised by compression, i.e. reducing the volume of the target text compared to the source text by simplifying its structure and removing secondary information.

1.5. Data accumulation procedure

During the experiment (Chernovaty, 2014), the participant was offered a game in which he translated children's fairy tales and short stories from language A (LA) and language B (LB) into a language that the other participants (father, mother and grandmother) did not know. The LA texts were read by his father or grandmother, and he translated them into the LB for his mother. The LB texts were read by the participant's mother, and he translated them into LA for his father and/or grandmother. The reading was conducted in short fragments, followed by a pause during which the participant translated what he had heard into the appropriate language. A total of eleven sessions were conducted (no more than one per day), each lasting from 5 to 32 minutes (total duration of all sessions: 121 minutes). In seven of these sessions, translation was carried out from LA to LB; in the other four, the process was reversed. The participant's translation was recorded on audio and then transcribed onto paper and into files containing

printed text. These texts were then analysed for evidence of the translation techniques described in the literature (see above).

1.6. Results and Discussions

1.6.1. Grasping the essence of translation

The participant needed a short transition period to understand the essence of translation. At the beginning of the first session, he could not grasp the need to switch between language codes. Interpreting his role as the transfer of information from one person to another, he successfully completed this task but remained within the source language. For example, having received the first message in LA (*Now summer is over*), he transmitted it to the addressee in the same language (*Summer is over*). When asked to translate this message into LB, he reformulated it as *Winter was over,* but again he stayed within the LA. When asked again, he reverted to his original version, staying within the source language. It was only on the fourth attempt that he managed to switch to LB (*Summer no more*).

This confirms our assumption that natural bilinguals require time to grasp the essence of the translation, even if only subconsciously. During this transition period, we also observed the simultaneous use of elements from both languages in the target text. For example, when translating the LA fragment (*He went to look for some sticks, and in two days he knock-knock and built his house*), elements of both languages were used: *In two... dneiz* (LA)... *days he tuk-tuk* (LA)... *knock-knock... i* (LA)... *already made his house*. However, the proportion of such a mixture of languages gradually decreased, and from the third session onwards, it only manifested in cases of serious difficulty. This may indicate the differentiation of the two language systems in the participant's mind, resulting in much more accurate recall from the two lexicons.

This can be also seen in the avoidance strategy, which was used by the participant in cases where the required equivalent from the target language was not available for any reason (see below). Rather than introducing the source language lexeme into the target text as he had done in the previous stage, the participant simply refused to translate the corresponding word (*I'm not gonna say it*).

1.6.2. Participant's translation strategies and techniques

In general, the analysed texts revealed almost all of the translation techniques described in the literature.

Firstly, a prominent feature of the participant's translation was compression, which is generally the characteristic of interpreting. Compression is indisputable proof of a sense-oriented strategy, since the participant must first understand the general meaning of the message and then modify its structure while preserving its content. This compression was achieved in various ways.

The first approach was to remove unimportant fragments of information from the source text, retaining only those which conveyed the main meaning. For example, the following 19-word sentence from the LA source text (*Autumn came, and the three little pigs realised that the merry times were over, and that they had to work*) was shortened to 11 words in the LB target text: *Three little piglets did know that they already need to work*. As can be seen, the reduction was provided by removing the fragments containing secondary information (*Autumn came* and *the merry times were over*), but the main idea of the original text was clearly retained: *The three little piglets… need to work*. Thus, in this case, we see an example of the translation technique known as deletion.

The second approach was to remove repetitive elements, as repetition is a stylistic characteristic of both folklore and children's literature. For example, the 20-word source text sentence (*Because you may turn without a house in winter, and because it will be cold in winter without a house*) was shortened to 10 words by eliminating repetition, without removing any semantic blocks: *Because when it's gonna be winter, you need a house*. As can be seen, the source sentence contains two repetitions of the elements *because*, *in winter* and *without a house*, which the participant successfully eliminated by using deletion and addition to introduce a new element (*already*), which is not explicit in the source text but can easily be inferred from the context.

Compression could sometimes take extreme forms. For instance, when translating one of the piglets' statements about the house made of sticks (*It would be so fragile and light*), the participant employed paraphrasing and deletion, reducing it to two words: *Not strong*. While this variant may seem incomprehensible in isolation, it fulfils its communicative function in context.

Another piece of indisputable evidence for a sense-oriented strategy is the participants' use of different types of contextual substitution. For instance, when translating the sentence (*She sat down the picnic basket*), the component (*cucumbers*) is used instead of the whole (*picnic basket*). Another example is taking a general term (*Good girl, you have learned an important lesson*) in the source text and using it in a specific meaning (*Good girl! You have learned what should not be done*) in the target text. There were also cases of generalisation, such as using the broader term (*meal*) instead of the more specific term (*breakfast*): *After breakfast, said Mother – After the meal, said Mother*.

Attempts at contextual substitution were not always successful, which is probably due to the lack of exact equivalents for some words in the participant's bilingual lexicon. This can explain the use of *tunnel* instead of *chimney* in the target text (*He saw a chimney there – Did see there a big tunnel)* or *to lie* instead of *to fool (The tired wolf decided to fool the piglets – He did get tired. He wanted to lie to piglets*). Sometimes it was a simple word (e.g., *kitchen*) that certainly was present in the participant's vocabulary, but its equivalent was not recalled for some reason, so he resorted to descriptive translation (*in the kitchen – in the room where food is prepared*). In other cases, there might not be a corresponding word available, and a random word was used (*I want to help, but I just get in the way – I wanted to help but I am getting in*).

Attempts were also made to introduce neologisms to denote concepts for which it was not possible to recall the equivalents from the target language lexicon. For example, when translating from LA, the participant could not recall the LB lexeme to denote the concept of *lazy*. To solve this problem, he created a neologism by transcoding the LA word, using it in the target text alongside an explanation of its meaning: *The other one did be... not good like the other one. Not so lenivyi (lazy) as the other one. Lenivyi means that he didn't want to build a house.*

The sense-oriented strategy is also evident in the numerous cases of source text sentence structure being transformed, including breaking long sentences into shorter ones, replacing proper names with personal pronouns and changing parts of speech. For example, when rendering the source text sentence (*And after that the Little Red Riding Hood and her grandmother had lunch together and a long chat),* the participant transformed it into a shorter version (*They had a meal. They were talking for a long time*). In doing so,

he split the long (18 words) sentence into two short ones (four and seven words respectively); replaced the group subject of eight words (*the Little Red Riding Hood and her grandmother)* with one pronoun (*they*); applied generalisation by using the genitive concept (*meal*) instead of the specific one (*lunch*); applied deletion by removing the redundant elements (*and after that* and *together*)*;* replaced the adjective (*long*) with an adverbial modifier (*for a long time*). All these operations are not typical of literal translation, and therefore clearly indicate a sense-oriented strategy.

Other evidence of this strategy includes the widespread use of permutations alongside other transformations, such as replacing passive constructions with active ones and clauses with complex coordinate sentences (It may be gone *with the wind – Wind can blow and it can go far away*).

As a result of semantic processing of the source text, there were also cases of addition related to reinterpretation of the source sentence. This indicates that the child conveys the situation as he imagines it. For example, the sentence (*A hunter, who was chopping trees nearby, heard the cry*) was transformed in the participant's translation into an extended story: *He was cutting the trees and heard the Little Red Riding Hood shouting 'Help! Help!'.* Here, the phrase *heard the cry* has been expanded to include direct speech, convincingly indicating a vivid scene that arose in the child's imagination. Other examples of theatricalization in translation prove that the translator relies on his imagination rather than the structure of the source text, as is the case in literal translation. For example, the narrative sentence (*The wolf was surprised that the house turned out to be stronger*) turned into direct speech in the target text: *He thinks, Why can't I blow this house away?*

Antonymic translations also support the sense-oriented strategy, as they require the source text's sentence structure to be transformed. One example of such a transformation is the introduction of negation in the target text when it is absent from the source text: *Remember, go straight to grandma's house – Don't forget. Go ahead to grandma's house; The house stood – The house didn't fall down.*

An interesting example in favour of the sense-oriented strategy is a case demonstrating the participant's intuitive assessment of the addressee's information potential. This concept is covered in professional translator training. Such consideration is required when a message contains implicit information that may be unknown to the addressee, as this implicature may be revealed in the target text.

Having translated the source text (What *are you doing out here, little girl? – the wolf asked in a very friendly voice*) as (*What* are you *doing, little girl? – the wolf asked in a good voice*), the participant decided that the intended recipient of the translation (his grandmother) might think the wolf was nice. To ensure the translation was understood accurately, he added his own comment: *Actually, he was not that good, he ate up grandma later on.*

To be fair, it should be noted that the participants' translations also contained fragments that could be interpreted as having been formed through calquing. This could be seen as an argument in favour of the literal translation strategy. The degree to which the structure and lexical content of the fragments coincided in the two languages varied from almost complete (First *I'll build the house, and then I'll go and play – First I'm going to build the house and then I'm going to go and play*) to partial. In the latter case, some parts of the fragments were rendered through transformations. For example, in the sentence I *want to build my house out of hay (*in the source text – *I want to build a straw house*) we see the transformation of *straw house* into *house out of hay.* However, calquing was only present in small amounts overall, although it tended to increase towards the end of the experiment, possibly due to the participant's developing translation skills. This assumption requires further investigation.

1.7. Conclusions

Thus, the study enables us to draw some preliminary conclusions.

The ability to translate is probably innate, as the participant was able to translate from language A into language B and vice versa after a brief psychological adjustment period. The quality and volume of his translations increased consistently from one session to the next: processing the source text became 5.7 times faster (increasing from 241 to 1366 characters per minute), and generating the target text became five times faster (increasing from 248 to 1251 characters per minute). Therefore, the development of translation competence directly depends on the amount of deliberate practice.

During the translation process, the participant primarily employed a sense-oriented strategy. However, a small number of fragments could be interpreted as the result of calquing, i.e. literal translation. As the proportion of the latter increased slightly towards the end of the experiment, possibly

due to the development of his translation competence, the use of calquing and literal translation requires further study.

Despite having no previous experience, the participant used almost all of the translation techniques described in the literature during the translation process (calquing; transformations, including transcoding; contextual substitution; specification; generalisation; antonymic translation; descriptive translation; sense development; change of part of speech; word addition; word permutation; and word deletion). This suggests that these techniques are innate and used in translation regardless of translators' actual awareness of them. It is most likely that such techniques simply follow the principles of information storage and processing in the human mind, and are not limited to translation. At the very least, they are used in monolingual communication, which also employs these procedures — particularly when paraphrasing within the same language (i.e. intra-lingual translation in the terminology of Jakobson (1959). Furthermore, these procedures are based on the corresponding logical operations that apply to thinking in general.

1.8. Limitations

This study has a number of limitations. In particular, these relate to the use of only one participant and one language pair, the limited time of the experiment, and other parameters mainly related to the possible impact of the participant's individual characteristics. Overcoming these limitations represents a prospect for further research.

CHAPTER 2
TRANSLATORS' PROBLEMS AND DECISION MAKING

2.1. Introduction

The translator training model should be based on a sound psychological model of the translation process. An impressive amount of research has been conducted in this area recently, which could be used to start constructing such a model. In the last fifteen years alone, quite a few investigations of this issue have emerged. Attempts have been made to review the available research on the translation process in the preceding four decades, highlighting cognitive complexity, data challenges and the central role of monitoring (Latif, 2025). López and Martín (2022) analysed methodologies in cognitive translation studies, focusing on experimental, observational and text-based research and the associated challenges. Other authors (Whyatt et al., 2023; Al-Ghamedi, 2024) have conducted systematic reviews of cognitive research methods such as eye tracking and keystroke logging to investigate translators' mental processes.

Some of these authors (Carl, Tonge & Lacruz, 2019) have even proposed a novel systems theory model that views translation as an interaction between word and phrase systems, which can be measured using gaze and production data. Others (Temizoz & Gough, 2024) have attempted to assess the impact of technological advances and collaborative workflows on translation processes, task distribution and revision practices. Robinson (2019) attempts to integrate theory and practice by offering translators practical advice on efficiency and problem solving. Meanwhile, Yunus et al. (2022) emphasise the importance of detailed reporting of translation processes to ensure trustworthiness and accurate meaning transfer.

The translation process involves many factors (see Bajo et al, 2001; Lörscher, 2005; Dam-Jensen & Heine, 2009; Göpferich & Jääskeläinen, 2009; Martin, 2014). Different authors studied various aspects of the problem, including situating translation competence in translation studies (Shreve, 2006), the processing of source and target texts (Balling, Hvelplund & Sjørup, 2014), micro- and macro-translation units (Alves & Goncalves, 2015), the

development of translation process characteristics in the acquisition of translation competence (PACTE, 2019) and other.

In this paper, however, we will focus on just two of these factors. Both relate to the decision-making process, which is closely linked to problem-solving situations. We will examine translation difficulties (problems arising in translation process) (Nord, 1991; Gambier, 2010), their sources (Didaoui, 2007; Gile, 1995; Hansen, 2008) and strategies used to overcome them (Lörscher, 2002; Chesterman, 2005; Gambier, 2009).

2.2. Literature review

The sources of difficulties in translation, which cover linguistic, cultural, syntactic and cognitive challenges, have also been extensively researched lately. Specifically, Al-Tameemi and Farhan (2016) found that legal translation from Arabic into English is hindered by a lack of equivalents, complex syntax and culturally specific terms. Dewi (2018) found that students struggled most with grammatical and lexical adjustments when translating newspaper articles from Arabic into English. Mraček (2018) demonstrated that translating from a native (Czech) into a foreign (English) language is more challenging, particularly with promotional texts. Using eye-tracking and keystroke data, Vanroy et al. (2018) investigated features such as error count, word entropy and syntactic issues, linking them to cognitive load. Mahmud and Halimjon (2019) examined grammar and structural issues in the translation of political texts from English into Tajik.

Using eye-tracking and self-assessment, Liu et al. (2019) demonstrated that an elevated level of text complexity increases cognitive load during translation. Sivakumaran (2021) identified syntactic errors, idioms, ambiguity and a lack of strategy as significant challenges in English-Tamil translation. Pratiwi and Prihatini (2022) found that students struggled most with idioms, elliptical structures and conveying textual meaning. Lim et al. (2023) used word alignment in corpora to estimate translation difficulty, demonstrating its strong predictive power compared to other methods. Rifani and Nuran (2024) identified lexical, stylistic, and cultural challenges as the most significant when translating idiomatic expressions. In summary, translation difficulties stem from a combination of linguistic complexity, cultural mismatch,

syntactic differences and cognitive strain. These difficulties are particularly evident in idioms, specialised texts and translations into a second language.

Researchers have also not overlooked the problem of strategies for overcoming translation difficulties. Specifically, Wu (2009) identified six strategies for overcoming these difficulties: retaining the original cultural flavour; transliteration, with the option of adding a generic word; transference; idiomatic analogues; translating implicatures; and explanation. These strategies are intended to bridge cultural gaps in intercultural communication. Rasul (2016) identified compensation, modulation, omission and expansion as strategies for resolving lexical, syntactic and cultural constraints in English-Kurdish news translation. Ali and Rushaidi (2017) found that Omani students used synonyms, cultural equivalents, paraphrasing and idiom-to-idiom matching to translate idiomatic and culturally specific expressions from English into Arabic. Conversely, Lucito (2020) found that students used generalisation and paraphrasing to handle unfamiliar vocabulary and cultural terms, particularly in religious texts.

In Syukrina's (2021) study, students relied on natural borrowing, adaptation and literal translation to overcome challenges relatd to grammar, vocabulary and sentence structure, particularly when translating religious terms. Meanwhile, Jatikusumo et al. (2022) discovered that students employed literal translation, discursive creation, modulation, reduction, generalisation and paraphrasing to address issues such as idioms, ambiguity and complex sentences. Based on these and other studies, Zhao (2023) suggests that educators should use critical thinking, cultural instruction and practice-based learning to equip students with coping strategies. Djumaeva (2025) adds that the use of context clues, cultural competence training and translation technologies can significantly reduce student translation errors. De Silva, Wikramasinghe and Gunathilaka (2019) studied the experience of professional translators and discovered that they used combinations of paraphrasing, borrowing, calquing, neologisms and annotations to address cultural terms in Sri Lankan literature. Meanwhile, Wijaya and Rini (2024) applied Mona Baker's translation strategies (generalisation, cultural substitution and omission) to handle difficult cultural and linguistic content. In summary, these studies demonstrate that translators, including students and professionals, employ various strategies such as generalisation, paraphrasing, borrowing and cultural substitution to overcome translation

challenges, particularly when dealing with idioms, cultural terms or structural discrepancies.

Despite the substantial body of research in this field, the issue of identifying the causes of these challenges and devising effective strategies to overcome them remains pertinent, particularly in the context of specific language pairs. This is because the linguistic and cultural nuances inherent in each language and cultural pair influence the nature of these challenges and the strategies required to address them. Consequently, research into the sources of these difficulties and how to overcome them in the Ukrainian–English language pair is important, which is why we focused on this topic in our study.

2.3. Methodology

To examine the sources of translation difficulties and the strategies employed to address them, an analysis was conducted of students' behaviour in ambiguous situations. Data for the analysis were collected through six sets of tests conducted at three Ukrainian universities: V. N. Karazin Kharkiv National University, Sumy State University, and Oles Honchar Dnipro National University. The study involved over 200 participants: senior undergraduate students in their fourth year and junior graduate students in their first year.

The participants were given two types of task. The first task involved translating English specialist terminology into Ukrainian. To establish clear context, the terms were presented within complete sentences. For example, the terms to be translated are shown in italics: Everyone has the right to an *effective remedy* (1) by *competent national tribunals* (2) for *violations of the fundamental rights* (3) *granted* (4) to them by *statute* (5) or local *ordinance* (6).

The second type of task was designed to evaluate students' ability to understand implicit information relating to religious and mythological references or proverbs. Participants were required to translate sentences such as *Delilah will first do you a favour and then do you*.

Their translations were analysed to identify the cause of any difficulties and the translation strategy chosen to overcome them. The results of the analysis are presented below.

2.4. Results and discussion

2.4.1. Causes of translation difficulties

Our analysis has revealed four causes of translation difficulties. These are described in more detail below.

Variations in the principles of terminology composition. In our study, we primarily found such differences in musical terminology, where historical and cultural influences have led to different principles underlying the formation of certain terms. This is particularly evident in musical notation systems used in different cultures: For example, Ukrainian uses Latin terms such as *Do, Re, Mi, Fa*, whereas English-speaking cultures use the letters of the Latin alphabet such as *A, B, C, D*. The transfer of corresponding concepts from one language to another is further complicated by the fact that the two systems have different reference points. Contrary to what one might expect based on the logic of the Ukrainian system, the first note of the octave in the English system is labelled *C* rather than *A*. This is because counting in the English system begins with the note *La*, which is labelled *A*, and subsequent notes are labelled with subsequent letters of the alphabet (*B, C, D*, etc.). This can lead to difficulties in understanding the source text and conveying the same meaning in the target text.

Another example from this area is the difference in the principles of constructing chord names in two languages, for which Latin elements are used in Ukrainian (e.g. *terts-kvart akord*), and native English elements in English (*four-three chord*). In addition, in the Ukrainian term, the first to be indicated is the interval (*tertsia*), which the fifth tone, located below (bass), forms with the seventh tone, and then goes the one it forms with the root tone (*kvarta*), and in English, it is the other way around. That is, this chord in Ukrainian can be shown as *3/4 chord*, and in English as *4/3 chord*. At the same time, although we are talking about the same chord, adherence to the Ukrainian principles of constructing this term when translating into English (or vice versa) will obviously change its meaning.

Interlingual interference. At the lexical level, this phenomenon is observed when the forms of words in two languages are completely or partially identical, while their meanings are also completely or partially different. This was observed, for example, in the translation of economic

terms *net profit* as *profit from the network* (hereinafter, examples are given in reverse translation), *interest rate* as *level of interest* or *competitiveness* as *competency.*

The field of musicology proved even more susceptible to interference, as evidenced by numerous cases of transfer of the graphic form of terms in such cases as *duplet – duplet* ('a rifle shot with two barrels simultaneously' instead of the normative *duol*), *triplet – triplet* ('three objects united on the basis of some common feature' instead of *triol*), *triad – triada* ('Chinese mafia' instead of *tryzvuk*).

Similar interference was observed in other areas. The first word of the phrase *arbitrary interference* in the legal sphere was often confused with the term *arbitrazhnyi* (*arbitral*) due to a false association with the term *arbitr* (*arbiter*), which in a legal context can be synonymous with the term *judge*. This led to a misinterpretation of the source-text collocation as *arbitrazhne vtruchannia* (*judicial interference*).

The interpretation of the second component of the religious term *Holy Communion* in sentence 1 (*Unlike Holy Communion, Communism, as any other revealed religion, is largely made up of prophecies*) was negatively influenced by intralingual interference in terms of form, as a result of which it was often confused with similar Ukrainian loanwords *komuna* (*commune*) or *komunism* (*communism*). This naturally led to incorrect translation variants. Similarly, the distant similarity of the biblical term *mammon* (*money*) to another religious term (*Mormon*) in sentence 2 (*Mammon talks, and it's the only conversation some people are interested in*) caused false associations and unsuccessful attempts at semantic development.

Intralingual interference. In this case, confusion occurs not between lexical units of different languages, but between lexemes of the same language. The example already mentioned, with the translation of *arbitrary interference* as *judicial interference*, can be explained as the influence of intralingual interference through associations with the English lexemes *arbiter* and *arbitral.*

In musicology, examples include the confusing of similar-looking terms quaver note (1/8 note) and quarter note (1/4 note) or complete homonyms *major* and *minor* in collocations *C-major* (do-mazhor) or *minor third* (mala tertsia) and *C-minor* (do-minor) and *major third* (velyka tertsia), where their meaning can only be deduced from the context.

The interpretation of the aforementioned terms *Holy Communion* and *Mammon* in sentence 1 was accompanied by both interlingual and intralingual interference. In the first case, this was observed with similar-sounding words such as *union* and *community*, which explains why students proposed options such as *sviate bratstvo* (*Holy Union*) and *sviata spilnota* (*Holy Community*). In the second case, students' decisions were influenced by the distant similarity of the term *mammon* to lexemes *mammal* and *mumble*, which explains some of the unexpected variants that appeared in the translation (see further).

Other examples of intralingual interference include cases of mixing the forms of such biblical concepts as *gentile* (*with the word gentleman*) in sentence 3 (*Gentile would believe everything they don't understand*) or *beatitude* (*with the word beauty*) in sentence 4 (*Never follow any Beatitude including this*).

Deficit of background or subject knowledge. This is a major source of ambiguity, as a lack of knowledge in this area makes adequate comprehension of the source text — and thus its translation — practically impossible. For example, a lack of understanding of law prevents a translator from fully grasping the meaning of the English term *enforceable right* (the right to file a complaint) and finding its correct Ukrainian equivalent (*parvo z pozovnoiu syloiu*). Even when translating from Ukrainian, difficulties can arise in interpreting the meaning of this phrase.

Knowledge of the Bible is necessary to understand the meaning of the word *shibboleth* in sentence 5 (*The shibboleth of a lot of marriages is a lot of shibboleth*). Originally a password used to distinguish friend from foe, this Bible-derived word eventually came to mean *'a stock phrase'*. Without this knowledge, interpreting the meaning of a phrase containing the word is almost impossible.

Likewise, the knowledge of the biblical legend about Sodom, Gomorra and the righteous man Lot is necessary to interpret the meaning of sentence 6 (*The man who expects a woman to be Lot's wife, has probably been married before*) related to this episode. Without such knowledge, attempts to convey the meaning of the source were generally unsuccessful (e.g., *The man who expects his wife to be loyal, has probably not been married before*)

A lack of background knowledge of classical mythology can hinder the correct interpretation of messages containing mythological allusions. For

instance, viewing Apollo solely as a symbol of male beauty can prevent the comprehension of sentence 7, where he represents happiness (*Happiness does not last long, but how intense it is*!). Without this awareness, students either resort to a literal translation, which generally bears little resemblance to the meaning of the source text (*Beauty is truly high, but it does not last long*), or improvise, straying even further from the original meaning (see below for more information). Similarly, associating Aphrodite only with beauty does not contribute to the correct interpretation of sentence 8 (*When Aphrodite dies of starvation, it's usually the man's fault*), in which she represents love (*When the flame of love is dying out, the one to blame is he who failed to put wood on the fire*). Attempts to translate this sentence literally were unsuccessful (e.g. *When a woman dies of distress, it's usually the man's fault*).

Thus, analysis of the participants' translations allowed us to identify at least four sources of difficulty in interpreting the content of the source texts: variations in the principles of terminology composition, interlingual and intralingual interference, and deficit of background or subject knowledge. In the next section, we analyse the strategies the participants applied to overcome those difficulties.

2.4.2. Strategies to overcome translation difficulties

Verbatim translation. This strategy was used quite often. Especially in cases where the meaning of the source text was not entirely clear, participants tried to translate as closely as possible to it. This applied to many musical terms, in particular names of intervals (translated using Ukrainian ordinal numbers instead of Latin terms), chords (the order of numbers in the English source was retained instead of rearranging them), musical styles (e.g. *cabaret song* was translated as *song in a cabaret style* as a substitute for the regular *shansonetka* term). A similar situation was observed with regard to economic vocabulary: the term *passive bonds* was translated literally as *interest-free bonds* (in reverse translation); *drafts as projects* or *rough drafts* instead of normative *bills of exchange; stock market as market for shares; stock jobbing* as *working reserve,* etc. In general, the participants used literal translation to render the collocations consisting of common everyday words, instead of an equivalent term in Ukrainian.

Transcoding. This strategy was used in cases where the meaning of the source term was unclear, but it seemed a good candidate for transcoding. This applies to many musical terms, some of which have already been mentioned above: *duplet*, *triplet*, *triad*, *treble*, *grace note*, *perfect unison*, *mode*, *scale.* In all these cases, the use of transcoding resulted in the production of incorrect equivalents in the target language. Having correctly chosen transcoding as the translation technique for the term *melisma,* the students are unaware that in Ukrainian it is only used in the plural (*melizmy*), as it refers to small melodic embellishments and their conventional symbols. The result of this lack of awareness was the logical use of the singular form (*melisma*), which, however, is incorrect in this case. Transcoding is also favourable for translating certain economic terms, such as *monopoly*, *oligopoly* and *dividends*, which were translated correctly in 92% to 100% of cases, while others, such as *dumping*, were more difficult (31% correct). This is explained not only by the possible lack of background knowledge about this term, but also by the peculiarities of transcoding in this case. The term *quota* (in the meaning of *portion*, *segment*) also proved difficult to translate, with most of the translators rendering it as *quota* (in the meaning of *norm*) using transcoding.

Associational expansion. Translating in conditions of entropy, participants intensively sought ways to solve translation problems, actively involving associative mechanisms in this process, which resulted in numerous and often unexpected cases of semantic development.

For example, entropy regarding the collocation *Holy Communion* in sentence 1 caused semantic development in several directions at once. Development along the lines of *Communion – union* led to the emergence of such variants as *Holy Union* and *Holy Society*, along the lines of *Communion – commune*, *Holy family* and *Holy society* were proposed, and along the lines of *Communion – community*, equivalents such as *Holy congregation* and *Holy brotherhood* were observed.

The uncertainty regarding the term *mammon* in sentence 2 led to a semantic development along the lines of *Mammon – Mormon – religion – prayer – sermon – prophet* (e.g. *Sermon on the Mount is the only speech some people are interested in*), *mammon – mammal (*e.g. *The language of mammals is the only language that humans speak and are interested in),* and *mammon – mumble* (e.g. *Mammon gossip is the only thing some people are interested in*).

Semantic development along the lines of *Beatitude* (in the meaning of *advice*) – *beauty* in interpreting sentence 4, resulted in the variant *Never follow any beauty including me*, which completely changed the meaning of the original sentence.

Sometimes associative connections gave rise to unexpected variants of semantic development. For example, when translating sentence 9 (*The leviathan is an imperfect animal compared to man who is a perfect leviathan*), the probable associative chain looked like this: *leviathan – levitation* (a hypothetical ability of a human to fly) – *bird* (because it flies) – *albatross* (a kind of bird) – *albino* (*albinoss* in Ukrainian) (because it is similar in form to *albatross*). This explains the variant suggested by one of the participants: *The albino(ss) is an imperfect animal compared to man who is a perfect albino(ss).*

Logical inference. Logical thinking is a powerful tool for solving intellectual problems, and it generally fulfils its function well. However, in some cases, the logical conclusion can lead to an incorrect translation. For instance, the assumption that the letter *A* denotes the note *Do* in the English-language system of musical notation is logical but incorrect, leading to an erroneous translation. Similarly, it is logical but incorrect to conclude that the principles of forming musical terms denoting chords, intervals, etc. are the same in English and Ukrainian. Such assumptions were the source of incorrect decisions made by participants in specific situations.

Contextual deduction. This strategy is common when dealing with problems related to the ambiguity of the source text and has been widely used by participants in situations of entropy, although not always effectively. Examples of unsuccessful application of contextual deduction can be found in the translation of economic terms: *costs* as *prices*, *non-replaceability* as *impossibility of transportation*, *extra duties* as *additional obligations*, *sales promotion* as *calls to trade, demand* as *order, drawback tax* as *income tax.*

Significant problems arise when attempting to derive the meaning of phrasal verbs from context. For example, unsuccessful attempts to interpret the different meanings of carry on in sentence 10 (*He carried on carrying on with her, being completely carried away*) resulted in the following translation: *He carried on being angry with her, even though he was completely captivated by her*. Similarly, an incorrect inference from the context of the meaning of the phrasal verb *carry away* explains the following sentence: *He was desperately trying to stay with her until he got completely exhausted*.

Incorrect interpretation of context is also a typical cause of misinterpretation of the source text. For example, when translating sentence 11 (*As soon as she gets through with her arguments she would usually make up*), the participant misinterpreted the phrasal verb *make up*: *As soon as she finishes expressing her arguments, she usually moves on to her makeup*. The interpretation of sentence 12 (*Beggars can't be choosers*) was influenced by frequent and intense election campaigns in Ukraine, as a result of which the students' interpretations took a corresponding direction: *The poor cannot be elected* or *Slaves cannot vote*.

Improvisation. In situations where there is no clear answer, some students tried to improvise, coming up with different versions that either closely resembled the original or had nothing to do with it. However, these versions were grammatically correct and complete in their meaning. Some examples of such improvisations are given below.

While translating sentence 12 (*He came on a coin that had come out the night before*) some participants came up with unexpected, and sometimes surrealistic, versions: *She found herself in the same situation as last night; He demanded the coin that had come into circulation last night; He approached the cornerstone that had appeared the previous night; He arrived at the meeting that had taken place the previous evening*.

The same applies to sentence 13 (*Better to wear out than to rust out*): *Better to wear than not to wear*; *Better to be exhausted than stale*; and even *Better to undress than to rust*.

Withdrawal. A substantial number of participants opted for the withdrawal strategy. In order to understand the decision-making process of student translators in general, it is essential to grasp the reasons behind it. Student-translators' decision-making ability may be improved by finding answers to questions about the circumstances in which the aforementioned decisions are avoided, either partially or completely. Translators may have to choose from a range of options if they have any doubt, which can be difficult, especially if they have not had adequate training. This may have been the case for some of the problems our participants were trying to solve, and this is something we must consider. However, there also seem to have been cases where students had no alternatives. We therefore need to investigate the reasons for withdrawal further.

2.5. Conclusions

Our research identified four sources of difficulty for Ukrainian student translators when rendering the meaning of the source text (English). These sources include: variations in the principles of terminology composition in the two languages, interlanguage and intralanguage interference and deficit of background and/or subject knowledge.

To reduce the negative impact of the lack of background and subject knowledge, the structure and content of the training programme for student-translators and interpreters should be reconsidered. This should take advantage of the coordination of all the disciplines making up the curriculum.

The negative impact of the remaining three factors can be reduced by restructuring exercises and tasks on the basis of scientific data. Those could include elements that cause interlanguage and intralanguage interference, provoking errors and neutralising negative effects through subsequent activities.

Research has identified seven strategies for dealing with ambiguity in the source text: transcoding, verbatim translation, associational expansion, logical inference, contextual deduction, improvisation and withdrawal.

All of these strategies (except withdrawal) can contribute to solving translation problems, but it rarely happens in practice. Students tend to use transcoding to translate ambiguous words, but this often fails. If the source text meaning seems clear, they mostly use verbatim translation, with occasional addition or deletion. In other cases, associational expansion, logical inference, contextual deduction or improvisation is used, with varying success. To improve efficiency, these strategies should be systematically trained throughout the course of study.

Given the natural limitations of this study, its conclusions are preliminary and require further research to be substantiated. Another intriguing aspect of studying the translation process is comparing its characteristics in its spoken and written modes. This issue is explored in the next chapter.

CHAPTER 3
TRANSLATION PROCESS VS INTERPRETING PROCESS

3.1. Introduction

Understanding the translation process is important not only for constructing its psycholinguistic model, but also for effectively managing the development of translator's professional competence. The content of the translation process has been studied by many researchers. In particular, the works by W. Lörscher (1992; 1996; 2005) have certainly been influential. His foundational book (Lörscher, 1991), remains a cornerstone in translation studies and his models and frameworks continue to be widely referenced and applied in recent research, particularly in studies utilizing think-aloud protocols (TAPs) and process-oriented approaches.

For example, Fereydouni and Karimnia (2016) conducted a case study using Lörscher's (2005) model to analyse translation strategies among Iranian M.A. students, finding significant differences in the frequency of strategy use and highlighting the prevalence of negative solution to a translational problem as an ending strategy. Other studies (Carl, Tonge & Lacruz, 2019; Nwachukwu, 2024) reference Lörscher's frameworks when discussing process-oriented translation studies and the cognitive aspects of translation. Recent papers have expanded on Lörscher's process-oriented approach, introducing new theoretical models that incorporate cognitive, cultural, and sociological perspectives.

Different authors focus on different aspects of the problem, such as empirical (Tirkkonen-Condit & Jääskeläinen, 2000; Carl, Bangalore & Schaeffer, 2016), integrative (Alvstad, Hild & Tiselius, 2011), neurocognitive (Annoni, Lee-Jahnke & Sturm, 2012) and interdisciplinary (Ehrensberger-Dow, Gцpferich & O'Brien, 2014). Other researchers study the specifics of different types of mediation, such as simultaneous and consecutive interpreting (Gile, 2009) and summary translation (Shreve, 2006a).

A study of different types of translation/interpreting is also valuable as each has its own characteristics. Gile (2009) argues that the translation/

interpreting process comprises three groups of efforts and each group uses a portion of the brain's processing capacity. When the capacity required to perform a task exceeds the available capacity, performance deteriorates. Research (Gile, 2009) has partially confirmed this assumption by comparing the relative efficiency of simultaneous and consecutive interpreting from a foreign (English) into a native (French) language of the same source text. However, there is currently no data on the correlation between other types of translation or interpreting.

3.2. Method

Thus, the purpose of this chapter is to assess the validity of Daniel Gile's hypothesis concerning the relative efficiency of translation and interpreting from a foreign (English) into a native (Ukrainian) a language, with a view to formulating the hypothesis and its further investigation on a larger number of participants. To achieve this goal, we had to complete several tasks: select a source text and participants, organise translation and interpreting from English to Ukrainian, carry out a comparative analysis of the two target texts, compare the results, formulate conclusions and outline prospects for further research.

Research participants were five female first-year MA students (translation specialism) from the School of Foreign Languages at V.N. Karazin Kharkiv National University, aged 21-23. They had studied English as a second language (French as a first), for a minimum of twelve years at the secondary and tertiary levels. Their command of English ranged B2 to C1 in CEFR scale (CEFR, 2018). The participants were halfway through the legal translation course, so for the experiment, we selected a 249-word original source text adapted from Burnham (1999) (see Appendix). The participants were allowed five minutes to look through the text, then they sight-translated it and (after 40 minutes of a different type of activity) translated the same text in writing. The total time for these two tasks was 60 minutes per each of the participants who were properly motivated as both tasks were part of their regular modular assessment to be considered when evaluating their progress throughout the semester.

Both texts were assessed based on the adopted strategy (literal or sense-oriented), the amount of ST information preserved in the TT, linguistic

accuracy and coherence. We also considered the subjects' fluency in interpreting and orthographic control in translation.

3.3. Results and Discussion

Due to the limited space available in this chapter, we will compare the two modes of mediation (translation and interpreting) by analysing the target texts of only one representative participant. The analysis is presented in a sentence-by-sentence format.

Sentence 1. *The Eighth Amendment states that cruel and unusual punishments shall not be imposed* (expected translation: *Восьма поправка до Конституції США забороняє жорстокі та незвичні покарання*).

The overall rendering of this sentence was acceptable both in translation and sight translation.

In the translation, the participant mostly used a literal rendering of the ST (*Восьма поправка США вказує, що жорстокі та незвичайні покарання не повинні застосовуватися*) with some unnatural word order. There is an appropriate addition of the abbreviation (*США*), confusion between similar-looking words (*незвичайні* instead of *незвичні*), and an imprecise choice of word (*вказує* instead of *зазначає*).

In sight translation (*Восьма поправка до Конституції Сполучених Штатів проголошує, що… не повинні бу… не повинні використовуватися… жорстокі… та… незвичні покарання*), we mostly see the copying of the ST structure and the appropriate addition of the phrase (*до Конституції Сполучених Штатів*). On the other hand, there are more problems with generating the target text (TT). In particular, the phrase *не повинні використовуватися* has been moved from the final position to immediately after the predicate, and there are several instances of the inadequate use of *використовуватися* (instead of *застосовуватися*), as well as the movement of *покарання* to the rhematic position. Unmotivated pauses (self-correction of *не повинні бу… не повинні використовуватися* and delays in recalling the modifiers *жорстокі та незвичні*) clearly indicate problems in interpreting.

Sentence 2. *Based upon this, the Supreme Court in 1972 banned the use of capital punishment* (expected translation: *Виходячи з цього, у 1972 році Верховний суд заборонив смертну кару*).

Both modes contain errors relating to the misunderstanding of the modifier *capital*. In translation (*Виходячи з цього, Верховний суд у 1972 році заборонив використання основного покарання*), the participant used *основне покарання* (instead of *смертна кара*), and in sight translation (*Виходячи з цього, Верховний суд постановив у 1972 році правила покарання*) – *правила покарання* (instead of *смертна кара*). In the latter mode, there is another information error – the use of *постановив* instead of *заборонив* to convey the meaning of *banned*. Both modes relied heavily on literal translation but in sight translation, the predicate (*постановив*) has moved to a position immediately after the subject (*Верховний суд*).

Sentence 3. *The reasoning for the decision was that the death penalty was selectively invoked on an arbitrary basis by judges and juries* (expected translation: *Це рішення суд аргументував тим, що винесення вироку суддями й журі про смертну кару часто було вибірковим і суб›єктивним*).

In writing, we mostly see literal translations accompanied by inappropriate additions, such as *покарання смертною карою* (which causes a tautology), as well as an information error: *на арбітражі* (instead of *суб'єктивно*) caused by interlingual interference, specifically, an erroneous attribution of identity to the terms *arbitrary* and *арбітраж.* The deletion of the word *basis* is also evident, due to the inability to interpret the phrase *on an arbitrary basis*.

However, there have been many more problems with sight translation. The participant attempted to stick to a literal translation in the first half of the sentence, but encountered a number of issues, not knowing how to translate the word *reasoning*, he added a modifier (*найголовнішими*) to it. However, he was unable to find an equivalent for the main word, so the collocation remained incomplete. Failing to interpret the word *selectively*, he had to delete it from the translation. There were also some information errors, preceded by unmotivated pauses, such as the incorrect rendering of *invoked* as *заборонена*; the inappropriate use of *на арбітражі* (instead of *суб'єктивно*), and the incorrect attribution of identity to the terms *arbitrary* and арбітраж. Other pauses were related to self-corrections (*було покарання… була смертна кара*) and repetition (*яка… яка була*).

Sentence 4. *By 1976, however, states had revised their laws to limit the power of judges and juries in passing such sentence* (expected translation: *Однак до 1976 року штати переглянули власні закони й обмежили права суддів і журі у винесенні такого вироку*).

In translating this sentence, both modes employed a literal strategy, accompanied by the omission of *however* (probably due to cognitive overload) and poor word combinations (*зменшили права* and *зменшити повноваження*) – in both cases, the verb *обмежити* would have been a better choice. The information error – using the phrase *відповідно до цього закону* (instead of *у винесенні такого вироку*) when translating the English phrase *in passing such sentence* – is explained by a misunderstanding of the original sentence.

Pauses during sight translation were related to self-correction (*У тисяча… до… 1976 року*), and the search for syntactic (*до 1976 року… штати змінили; закони… для того; для того, щоб… зменшити*) and lexical (*суддів та… журі; журі… за цим законом*) equivalents.

Sentence 5. *The Court held that these new laws did not violate the Constitution* (expected translation: *Суд визнав, що нові закони штатів не порушують Конституцію*).

This sentence was rendered adequately in both modes. The participant effectively added цілісність in the written mode (*Суд постановив, що ці нові закони не порушать цілісність Конституції*) and rendered acceptably the word *violate* as *змінять* in sight translation (*Суд… постановив, що ці нові закони… не змінять Конституцію*). In the latter mode, the two pauses were due to searching for the syntactic (*Суд… постановив*) and lexical equivalents (*нові закони… не змінять*).

Sentence 6. *While the Court admitted that the death penalty was "cruel" punishment, it denied that it was "unusual" – either today or in 1791, when the 8th Amendment was ratified* (expected translation: *Хоча Суд визнав, що смертна кара є «жорстокою», він заперечив, що вона є незвичним покаранням, як сьогодні, так і в 1791 році, коли восьма поправка була ратифікована*).

In both modes, the participant attempted to use a literal translation strategy. In each case, failing to correctly interpret the verb *deny* resulted in information error in the TT where the court instead of denying that the death penalty was unusual (in the ST), stated it *was* unusual (in the TT): *зауважив, що воно є незвичним* instead of *заперечив, що воно є незвичним* (in translation) and *вони також вважали її незвичним покаранням* instead of *вона є незвичним покаранням* (in sight translation).

Other errors in translation (*В той час, коли суд постановив, що покарання смертною карою є жорстоким покаранням, він також зауважив, що воно є незвичним – як сьогодні, так і у 1791 році, коли 8 поправка до закону була ратифікована*) included the use of a cardinal number (*8*) instead of an ordinal number (*восьма*) and incorrectly adding *поправка до закону* (instead of *до Конституції*).

The complicated structure of this sentence proved more challenging in sight translation (*В той час, коли суд… заборонив смертну кару… тому що вона вважається жорстоким покаранням, вони також… вважали її незвичним покаранням у 1791 році, коли восьма поправка була ратифікована*), as the participant's processing resources were insufficient to handle the full range of tasks. This resulted in additional information errors compared to translation. Firstly, the participant introduced the incorrect phrase *court banned the death penalty* which was absent from the ST (*суд заборонив смертну кару* instead of *суд визнав, що смертна кара є*…). Secondly, he added a cause-and-effect relationship to his TT that was absent in the ST (*заборонив смертну кару, тому що…*). The problems of looking for lexical equivalents are evidenced by the unmotivated pauses before choosing the incorrect equivalents for the verbs *admitted* (*заборонив* instead of *визнав*) and *denied* (*вважав* instead of *заперечив*).

Sentence 7. *While the constitutional problem with many death penalty laws has been the broad judge's power permitted, death as an automatic punishment upon conviction for certain crimes has also been annulled* (expected translation: *Хоча конституційною проблемою з чималою кількістю законів, що регулювали винесення смертного вироку, були занадто широкі повноваження судді, смертний вирок, як автоматичне покарання після засудження за певні категорії злочинів, також було скасовано*).

The increased complexity of sentence structures led to more information errors in both modes. In particular, in translation (*В той час коли конституційні недоліки з багатьма законами щодо смертної кари були заборонені через скорочення прав суддів, смертна кара як автоматичне покарання в ряді таких покарань також була анульована*), the first clause (*the… problem has been… broad judge's power*) was completely misinterpreted and rendered as *constitutional shortcomings… were banned due to restrictions on judge's power* (*конституційні недоліки… були заборонені через скорочення прав суддів*). Further misinterpretations

occured in the second clause where *certain crimes* was rendered as *a number of punishments* (*в ряді таких покарань* instead of *за певні категорії злочинів*).

In sight translation (*Поряд з конституційними проблемами… смертна… закони щодо смертної кари… також було… були широко застосовані… суддями, смерть… як автоматичне покарання… серед… серед інших… покарань також була анульована*), problems with understanding the ST exacerbated by the need to generate the TT simultaneously with the reading of the ST. This led to an increase in unmotivated pauses and information errors.

The literal translation of the first three words (*Along with constitutional problems*) was followed by a misinterpretation of the phrase *with many death penalty laws*, which serves as a modifier for the word *problems* (what kind of problems? – *with laws governing the imposition of the death penalty*). However, the participant ignored the preposition *with,* deleted the modifier *many*, and turned this noun phrase (*death penalty laws*) into a semantic object. He then invented a predicate in the passive voice (*were applied*) that is absent in the ST, and turned the modifier *judge's* (*whose power?*) into a semantic subject (*суддями – by judges*). As a result, this fragment of the sentence in the translation completely lost its original meaning, although it retained most of the words of the ST sentence. This poor overall understanding of the sentence resulted in another ambiguity, rendering *conviction for certain crimes* as *покарання серед інших покарань* (*punishment among other punishments*) instead of *punishment upon conviction for certain categories of crimes*.

This assumption is corroborated by numerous unmotivated pauses followed by self-correction (*смертна… закони щодо смертної кари; було… були широко застосовані*), repetition (*серед… серед інших*) and searching for lexical equivalents (*Поряд з конституційними проблемами… смертна…* (semantically inadequate); *застосовані… суддями* (semantically inadequate); *смерть… як автоматичне покарання* (acceptable).

Sentence 8. *The Supreme Court has cancelled statutes providing for mandatory death for all first-degree murder and for killing a police officer or firefighter* (expected translation: *Верховний суд анулював закони, які передбачали обов'язкову смертну кару за всі тяжкі вбивства першого ступеня, а також за вбивства поліцейських і пожежників*).

This structurally simple sentence posed few translation challenges (*Верховний суд закінчив ряд законів на обов'язкову смерть для вбивць першої ступені та для тих, хто вбив поліцейського або пожежників*), with only a few inaccuracies recorded. Specifically, the word *закінчив* was used instead of *скасував*; *вбивць* instead of *вбивств*; *пожежників* instead of *пожежника*; and the word *ряд* (*законів*) was added.

However, the sight translation processing mechanisms appear to become saturated even in this sentence, as evidenced by the unmotivated pauses before almost each word (*Верховний суд закінчив… цей статут…, забезпечивши… мандат… забезпечивши… покарання смертю тільки… для… тих, хто вбивав поліцейських та пожарників*). This may be explained by the cumulative effect of solving problems in the previous sentences which contributed to the participant's fatigue and decrease in the efficiency of general processing mechanisms. Unlike its written mode, in sight translation, the participant decided to transcode the terms *statutes* and *mandatory* (as *мандат,* converting adjective into a noun with a complete change of meaning: *мандат на покарання смертю*).

Other techniques included deletion of *for all first-degree murder* and the addition of new elements (*забезпечивши, тільки, тих, хто*) to alter the meaning and structure of the sentence. Pauses were used for self-corrections (*забезпечивши мандат… забезпечивши покарання*) and to search for lexical equivalents (*закінчив… цей статут* (stylistically inadequate); *забезпечивши мандат…* (semantically inadequate); *забезпечивши покарання* (semantically inadequate); *тільки… для… тих, хто* (acceptable).

Sentence 9. *The Court has also held that a death sentence was not acceptable for rape of an adult woman because it did not involve the killing of another human being* (expected translation: *Верховний суд також постановив, що призначення смертної кари за зґвалтування дорослої жінки є неприйнятним, оскільки воно не спричиняє вбивства людини*).

Rendering this sentence in translation (*Суд також заборонив смертну кару за зґвалтування повнолітньої жінки, тому що такий злочин не лишає життя іншу людину*) was semantically acceptable. The participant applied a number of transformations, including antonymic translation (*Court has also held that a death sentence was* ***not acceptable*** *– Суд також заборонив смертну кару*) and contextual substitution (*it did* ***not involve the killing*** *– злочин не лишає життя*). However, in the latter case, the use of *лишає* (instead of *позбавляє*) is stylistically inaccurate.

A literal approach to sight translation (*Суд… також… постановив, що… смертний приговор також не може відбуватися по відношенню до… жінок, тому що… забороняється вбивати інших людей*) generally failed. The inability to interpret the key words *rape* and *adult,* which were omitted from the TT, as well as misinterpretation of the word *involve,* translated as *забороняється* (*prohibits*) instead of *causes (спричиняє*), complemented by inaccuracy (*приговор* instead of *вирок*), resulted in the loss of the ST meaning. Unmotivated pauses related to searching for lexical equivalents provide additional evidence of the participants' difficulties: *Суд… також… постановив, що… смертний приговор* (problems with recalling each subsequent word); *по відношенню до… жінок* (inability to find equivalents for the components of the phrase *rape of an adult*, resulting in their removal); *тому що… забороняється вбивати* (inappropriate equivalent for *not involve (забороняється* instead of *спричиняє*).

Sentence 10. *The Court also reversed the death sentence of a defendant who had committed a murder when he was only 15 years old* (expected translation: *Суд також заборонив смертну кару для того, хто здійснив вбивство до 15-тиріччя*).

This sentence turned out to be relatively simple for both modes. In the translation (*Суд також заборонив смертну кару для того, хто здійснив вбивство до 15-тиріччя*), the participant deviated from the literal translation by substituting the noun (*defendant*) with a pronoun (*того*) and adding the word (*до 15-тиріччя*) to make the ST more accurate (the same was done in the sight translation).

In sight translation (*Суд також… звільнив від смертної кари тих, кому ще не виповнилося 15 років*), in addition to the substitutions and additions applied in translation (see above), the participant deleted the entire block of information (*who had committed a murder*) relating to the *defendant*. However, it did not affect the ST meaning as the deleted information is compensated for by the context.

Sentence 11. *A plurality opinion thought that evolving standards of decency under the 8th Amendment would prevent the execution under any circumstances of a person for a crime committed before the age of 16* (expected translation: *На думку громадськості, застосування «стандартів доречності», згідно з восьмою поправкою, дозволить запобігти ухваленню смертних вироків для злочинців, молодших 16 років, незалежно від обставин скоєння злочину*).

In translation, the rendering of this rather long sentence (*Багато можливостей для покращення стандартів покарання за 8 поправкою також можливо для осіб, які здійснили злочин до 16-тиріччя з будь-якими обставинами*) was generally acceptable, despite some semantic and stylistical losses, and required several transformations. These included the deletion of the word *thought* and the collocation *would prevent the execution* (due to an inability to interpret their meaning); the inadequate contextual substitutions of: *A plurality opinion* with *Багато можливостей* (due to a failure to understand the original phrase) and *evolving standards of decency* with *покращення стандартів покарання* (*improvement of punishment standards*). There was also an inadequate permutation (movement of *з будь-якими обставинами* (*with any circumstances*) to the end of the sentence – it would have been better to place it immediately after the word *злочин* (*crime*) to which it refers.

As expected, the structural complexity of this sentence caused problems during sight translation (*За восьмою поправкою… також… заборонялась смертна ка… кара для того, кому ще не випов… не виповнилося 16 років, незважаючи… на… певні… на певні зменшені обставини*). To cope with these issues, the participant employed several strategies. First, he deleted the problematic elements. The long phrase *A plurality opinion thought that evolving standards of decency* was deleted because he could not interpret it adequately, so he started translating from the words *under the 8th Amendment* instead. He also deleted the phrase *for a crime committed* because he lost control over the overall meaning of the utterance (this loss was partially compensated by context).

Other techniques included contextual substitution, such as using of *заборонялась смертна кара* to render *prevent the execution* (*запобігти виконанню смертного вироку*) and *зменшені обставини* (*reduced circumstances*) to inadequately render *any circumstances* – this created ambiguity (it should have been *незалежно від обставин скоєння злочину*). Moving the phrase *зменшені обставини* (*reduced circumstances*) to the end of the sentence seems to create ambiguity. Unmotivated pauses are related to repetitions (*смертна ка… кара; кому ще не випов… не виповнилося; незважаючи… на… певні… на певні*) or searching for lexical equivalents (*За восьмою поправкою… також… заборонялась*).

3.4. Conclusions

The results of this analysis of comparative characteristics of written and oral (sight translation) modes of mediation from a foreign (English) into the native (Ukrainian) language generally coincide with their comparative characteristics in the reverse directionality (Chernovaty & Kovalchuk, 2020a). The results broadly indicate that an individual's processing capacity is rarely overloaded when translating in the written mode. This is because this type of mediation is essentially discrete, meaning that the efforts involved in receiving, analysing, deciding on and producing the ST are applied sequentially. Consequently, the available processing capacity is usually sufficient to produce a TT of an acceptable quality. The short-term memory load is minimal as both ST and TT are always in front of the mediator, who does not need to memorise them. However, if the ST structural complexity increases, the cognitive processing mechanisms may become overloaded, resulting in a deterioration of the translation quality.

By contrast, sight translation requires a significantly greater cumulative effort over a given period of time, which has a detrimental effect on the standard of the TT. Sight translation requires more effort than its written counterpart because it is less discrete (see also Balling, Hvelplund & Sjørup, 2014). The interpreter must simultaneously perceive, analyse and translate the ST, ensuring the relatively fluent and loud TT production. Maintaining the general strategy of rendering a given ST fragment and coordinating the structural components within it requires considerable short-term memory effort.

As this type of memory has a retention time of no more than half a minute, it is often insufficient to meet the requirements. The outcome is inadequate coordination of separate speech fragments, a substantial decline in the TT standard and mistakes that are not characteristic of the interpreters' actual proficiency level in the target language. They are more indicative of the lower levels of their interlanguage that they have experienced during their linguistic development (see Selinker & Douglas, 1985). The interpreters solve the various multi-level problems in the mediation process by using techniques that are characteristic of the earlier stages of language acquisition, namely construction, completion (Ingram, 1992) and reformulation.

Hence, we can make the preliminary assumption (which requires verification across a larger population of participants) that a greater accumulation of parallel effort in sight interpreting from a foreign language into a native language leads to a deterioration in quality compared to written translation. As with the reverse directionality (Chernovaty & Kovalchuk, 2020a), output quality depends not only on proficiency in the two languages, but also on the interpreters' ability to coordinate their parallel processing capacity effectively. This ability can probably be developed through deliberate training, which requires further study and is one of the prospects for future research. Another interesting question is the degree of similarity between the psycholinguistic features of the process of rendering the content of source texts written in different languages into the same target language. This issue is discussed in the next chapter.

CHAPTER 4
STRATEGIES IN TRANSLATION FROM A NATIVE INTO A FOREIGN LANGUAGE

4.1. Introduction

In addition to the differences between translation and interpreting in terms of the time available for decision-making (and some other characteristics; see the previous chapter), there are other factors affecting target text quality. One of these is the impact of the source text (ST) structure on translation strategies. As this structure is partly determined by the source language, it is useful to analyse the process of translating texts written in different languages into the same target language and compare the translation strategies used in each case.

The importance of comparisons between different language pairs has been emphasized in literature (Ho, 2022) and practical projects. The latter were specifically related to such language pairs as German-English (McDonald & Carpenter 1981), Italian-English, Italian-French, Italian-German (Agrifoglio 2004), Polish-English (Chmiel & Mazur 2013; Chmiel et al. 2019; Chmiel et al. 2020; Lijewska et al. 2022), Kurdish-English (Fraidoon 2021), Romanian-English (Sitnic 2020), Indonesian-English (Putranti 2017), Chinese-English (Cao 2020; Su & Li 2020), Persian-English (Akbari 2017) and others. Considering that Ukrainian-English and Slovak-English pairs seem to be underrepresented, we have attempted to fill this gap.

4.2. Basic notions

4.2.1. Sight translation as an object of research

We selected sight translation (SiT) as a form of mediation through which to test our hypotheses concerning the effect of ST structure on translation strategy. For the purposes of this chapter, we define SiT as 'transposition of a message written in one language into a message delivered orally in another language' (Lambert, 2004: 294). This definition distinguishes it from sight interpreting, which is defined as 'simultaneous interpreting with text' (Lambert, 2004: 294).

SiT is sometimes considered a combination of translation and interpreting (Keníž, 1980; Cao, 2020), and is often used to prepare for consecutive or simultaneous interpreting (Sitnic, 2020), or to develop syntactic restructuring and paraphrasing skills (Ilg & Lambert, 1996; Ho, 2022). Consequently, it has not received much attention in interpreter training (Agrifoglio, 2004: 43). However, other authors (Gile, 2009; Čeňková, 2010, 2015) argue that SiT has its own value and is used at meetings for the oral delivery of written documents, at press conferences, and in community interpreting (Li, 2014). Despite some research in this area (see also Weber, 1990; Martin, 1993; Moser-Mercer, 1995; Shreve et al., 2010; Lee, 2012; Li, 2014; Chmiel et al., 2019; Su et al., 2020), sufficient knowledge about the underlying mechanisms of SiT is lacking. Consequently, investigating SiT is relevant for both theory and practice (see also Lee, 2012; Fang et al., 2022), as well as for our research purposes.

4.2.2. Translation strategies

In the broadest sense, there are two strategies for processing ST to render its content into TT (Lörscher, 2005; Tirkkonen-Condit, 2005; Balling, Hvelplund & Sjørup, 2014). These are the literal translation strategy, also known as the surface-oriented strategy (SurfOS), and the sense-oriented strategy (SensOS). It is believed (Lörscher, 2005) that professional translators and interpreters mostly use the SensOS strategy, whereas student translators tend to use the SurfOS strategy. Therefore, SensOS appears to be the ultimate objective of translator/interpreter training. In theory, SurfOS should provoke interference from the source language, but this may depend on the degree of proximity between the source and target languages. SurfOS may work satisfactorily as long as the structures of the two texts are similar. Furthermore, some authors (Tirkkonen-Condit, 2005; Balling, Hvelplund & Sjørup, 2014) consider SurfOS to be a 'translation universal', i.e. an inevitable stage that individuals must go through on their journey to becoming translation experts.

4.2.3. Translation strategies in sight translation

Some authors (Akbari, 2017; Putranti, 2017; Chmiel et al., 2020) suggest that problems with ST deverbalisation in SiT are caused by visual interference

from the source text (ST) (Shreve et al., 2010) and the overload of processing mechanisms caused by the limits imposed by the reallocation of cognitive effort (Gile, 2009).

Although SiT appears to be the most straightforward mode of interpreting due to the reduced demand on short-term memory and the interpreter's control over the TT delivery rate, research (Brady, 1989; Angelelli, 1999; Agrifoglio, 2004; Gile, 2009; Putranti, 2017; Ho, 2022) suggests that it may be equally demanding. The speed of delivery was found to be partly beyond the interpreter's control, while incorrect ST segmentation aggravated potential ST comprehension issues. Other factors include the simultaneous use of written and oral speech, underdeveloped anticipation and retrieval mechanisms, and available processing capacity to cope with interlanguage interference.

The latter factor includes the ST syntactic structure, among other aspects (Viezzi, 1989; MacDonald, 1997; Gile, 2009; Shreve et al., 2010; Lee, 2012). These discrepancies may indicate a greater short-term memory load, due to the need to retain ST information while it is converted into TT. Therefore, it can be assumed that the ST syntactic structure impacts the quality of the TT. This quality may be inversely proportional to the syntactic differences between the two languages in each specific case, particularly when the interpreter attempts to apply SurfOS or lacks developed SensOS mechanisms.

4.3. Methodology

4.3.1. Aim

Thus, our research aims to investigate the impact of ST syntactic characteristics on the choice of translation strategy (SurfOS or SensOS). Additionally, we sought to determine whether the chosen strategy is dependent on the source language. The study was based on the following hypothesis:

A source text whose syntactic structure aligns with the norms of the target language will encourage surface-oriented strategies, resulting in a target text that preserves the original structure. In contrast, a source text with a different syntactic structure will promote sense-oriented strategies

and the use of transformations. The latter will overload the processing capacity required to reformulate the source text fragments in the target text. It involves retaining the source text information in short-term memory until it has been reformulated in the target language. This process will consume a substantial amount of effort, resulting in a deterioration of the meaning, linguistic accuracy and delivery fluency of the target text.

In order to achieve this goal, we had to complete a number of tasks. These included selecting the languages, participants and source texts; organising their translation from a native language into a foreign language; analysing the target text; comparing the participants' results; formulating preliminary conclusions; and outlining the prospects for further research.

4.3.2. Languages and participants

We chose English as the target language because of its undeniable importance in international communication. We chose Ukrainian and Slovak as the source languages because they have been insufficiently researched and differ structurally from English.

The participants (P) included fifteen student translators, of whom nine were Ukrainian A-language speakers and six had Slovak as their A-language. The Ukrainian group comprised fourth-year BA students from V. N. Karazin Kharkiv National University (KKNU), aged 20–22. English was their second foreign language, after German, and their CEFR level ranged from B2 to C1. The Slovak participants were first-year MA translation students from Matej Bel University (UMB) in Banská Bystrica, aged 22–23. Their English proficiency (their first foreign language, with German or French as their second) ranged from C1 to C2 on the CEFR scale (CEFR, 2018).

4.3.3. Source text

Both English, on the one hand, and Slovak and Ukrainian (as Slavic languages), on the other, have the direct SPO (subject-predicate-object) word order. However, Slovak and Ukrainian have a more developed system of affixes, which means they have fewer limitations regarding the position of words in a sentence.

For instance, the English sentence:

The current market value offers interested parties a price (1)

may have a variety of structural equivalents in Slovak and Ukrainian. They may be based on the SPO model:

Súčasná trhová hodnota ponúka zainteresovaným stranám cenu (2),

Поточна ринкова вартість пропонує зацікавленим сторонам ціну (3).

In this case, the structures of the sentences (1)-(3) coincide completely, i.e. *value* and its equivalents *hodnota* and *вартість* are both the semantic and grammatical subjects, *offers* (*ponúka, пропонує*) – a predicate, and *price* (*cenu, ціну*) – the semantic and grammatical objects.

However, in both Slovak and Ukrainian, depending on their communicative intentions, speakers may change the order of the words without changing their forms or the propositional meaning of the sentence. For example, they may move the object to the beginning of the sentence (fronting), while placing the subject at the end without changing the word forms or propositional meaning. In this case, *cenu* (*ціну*) remains the object of the sentence and *hodnota* (*вартість*) – its subject:

Cenu zainteresovaným stranám ponúka súčasná trhová hodnota (4),

Ціну зацікавленим сторонам пропонує поточна ринкова вартість (5).

However, a similar transformation of the English sentence would lead to a complete change in its meaning:

A price offers interested parties the current market value (6).

Thus, applying the SurfOS strategy when the sentence structures in the source and target languages coincide – as in sentences (2) and (3) – does not negatively impact the propositional correspondence of the TT to the ST. However, in cases of dissimilarity, such as sentences (4) and (5), this strategy could lead to complete failure.

To study the impact of ST structure on the choice of translation strategy (SurfOS or SensOS) and TT quality, we selected STs for each group of participants. For the Slovak group, this was a 250-word non-specialised text entitled ‘Wild animals in town’, while for the Ukrainian group, it was a 157-word specialised text related to the structure of the economy, as the

participants were studying this topic on their economic translation course at the time.

We then modified the structure of each ST to differ as much as possible from the structure of its normative English equivalent, while remaining within the norms of the source language.

For instance, the SPO sentences (7) and (8):

Divá zver sa ťahá bližšie k ľuďom aj pre potravu, ktorá jej chýba (7)

Усі виробничі ресурси будь-якої країни є обмеженими й мають кількісну та якісну визначеність (8),

with their English equivalents (9) and (10):

Wild animals also move closer to humans for the food they lack (9),

In every country, all production resources are limited and have specific quantitative and qualitative characteristics (10)

were transformed into the sentences with the same meaning but a different word order (11) and (12):

Aj pre potravu, ktorá jej chýba, sa ťahá bližšie k ľuďom divá zver (11),

Обмеженими й такими, що мають кількісну та якісну визначеність, є усі виробничі ресурси будь-якої країни (12).

Basing on these modified sentences, we predicted the sentences (14) and (15) generated through the SurfOS strategy:

Also, for the food they lack, move closer to humans wild animals (14),

Limited and such that have quantitative and qualitative definiteness are all production resources of any country (15).

These predicted structures were then compared with the actual student output. If they coincided, this was regarded as evidence of the SurfOS strategy; otherwise, it was classified as the SensOS strategy.

The analysis was expected to provide a basis for conclusions about the impact of the ST structure on the choice of translation strategy, processing capacity, and TT quality.

4.4. Results and Discussion

4.4.1. The impact of the source-text structure on translation strategy

In general, the results of analysing the participants' translations suggest that the ST structure influences the choice of translation strategy, although this choice also depends on proficiency in the target language. Among KNNU students, whose average level of English proficiency is lower than that of UMB students, the share of the SurfOS strategy is 62%, compared to 37% among the latter.

For example, sentence 16 is a transformed version of a sentence with a direct word order (Ťažba dreva v lesoch a premnožovanie populácií vytláča zvieratá bližšie k ľuďom, aj z ich prirodzeného prostredia):

Bližšie k ľuďom, aj z ich prirodzeného prostredia (A), *vytláča zvieratá ťažba dreva v lesoch a premnožovanie populácií* (B) (16)

The predicted outcome of SurfOS strategy was expected to be:

Closer to people and out of their natural habitat, is pushing animals logging in forests and overpopulation (17).

In rendering fragment A of sentence 16, over half of the participants' output matched the prediction made in sentence 17: P1: *So closer to people, even away from their natural habitat*; P2: *Close to the people and from their environment*; P3: *Close to people and from their nature environment*.

The same can be seen in the translations of KKNU participants.

In rendering sentence 18:

Завдяки використанню ресурсів, тобто факторів виробництва, відбувається соціально-економічний розвиток країни й зростає обсяг ВВП (18),

which is the transformation of the direct word-order sentence:

Соціально-економічний розвиток країни відбувається, а обсяг ВВП зростає завдяки використанню ресурсів, тобто факторів виробництва (*The country's social and economic development, as well as its GDP growth, happen due to the use of resources, i.e. production factors*) (19)

with the predicted version:

Due to the use of resources (A)*, i.e. factors of production* (B), */ happens the socio-economic development of a country* (C) *and grows the amount of GDP* (D) (20),

the participants' versions mostly coincided with the prediction (e.g., fragment A): P1: *Due to the use of resources*; P2: *Thanks to the use of the resources*; P3: *Owing to the using of supplies.*

To be fair, it should be noted that UMB participants more clearly recognise situations where the ST structure allows it to be copied in TT, since the share of the SurfOS strategy in their translations of such fragments reaches 57%.

For instance, while rendering the sentence:

Ale veľkým problémom sú aj líšky (21),

which is a transformation of the direct word-order sentence:

Ale aj líšky sú veľkým problémom (22),

with the predicted version:

But a major problem are also foxes (23),

over 70% of the participants kept the word *foxes* at the end of the fragment: P1 – *but huge problems are now also created by foxes*; P2 – *but problem represent also foxes*; P3 – *but another huge problem are also foxes*.

The predominant orientation of UMB participants towards the SensOS strategy is also evident in its proportion of ST translation, which is 63%, compared to 38% among KNNU participants.

For example, when translating fragment B of sentence 16, all UMB participants used the SensOS strategy, employing passive transformation (P1: *animals are pushed away from forests*; P2: *animals are forced to leave the forest*) or fronting the subject (P3: *Logging is preventing animals from their natural habitat*; P4: *Logging and excessive population growth makes people…*).

The same can be seen among the KKNU participants, only on a smaller scale. The sentence:

До трудових факторів відноситься чисельність економічно активного населення (24)

is a transformation of the direct word-order sentence:

Чисельність економічно активного населення відноситься до трудових факторів (25),

with the predicted SurfOS translation:

To labour factors is related the amount of economically active population (26),

has been converted into the direct word-order sentence by over half of the participants who fronted the subject suggesting the variants *The labour factors include the amount of economically active population* or *The number of economically active population belongs* (*refers*) *to the labour factors.*

However, average values can be misleading. KNNU participants with the highest English proficiency scores have a significantly higher proportion of SurfOS strategy use (78%), while those with the lowest scores have the lowest frequency of use (11%). In other words, they use the SurfOS strategy almost exclusively.

For example, sentence:

Важливими є також запаси корисних копалин (26)

is a transformation of the direct word-order sentence:

Запаси корисних копалин є також важливими (27)

with the predicted version:

Important are also deposits of natural resources (28).

The minority of participants followed Pattern 28, while the majority applied various transformations (*Another important fact is…*; *The presence of natural resources is important, too; Mineral resources are very important, too*).

Conversely, it cannot be said that using the SurfOS strategy inevitably leads to distortion of the ST content or violation of the target language norms, even when the ST structure is not suitable for copying into the TT. Participants in both groups generally succeeded in conveying the ST content satisfactorily and adhering to the target language norms through certain TT adaptations.

For instance, UMB participants, in rendering fragment:

Ako príklad sa uvádzajú medvede (29)

with the predicted version:

As an example, are mentioned bears (30),

while generally following the ST structure, substantially expanded it (P1: *As an example, we can take, for example, bears*; P2: *For example, there are bears*; P3: *As an example, we could talk about bears*).

The same can be seen among KKNU participants. In rendering the sentence:

Сюди відносяться техніко-технологічний рівень основних фондів, вартість, вік і зношеність, відповідність екологічним вимогам і інші характеристики (31),

with the predicted version:

Here belong the technical-technological level of basic assets, cost, age and wear, conformity to ecological requirements and other characteristics (32),

the participants used various techniques combining the two strategies. They transformed the homogeneous elements into the group subject (*The technical and technological level…*), completed it with the predicate (*belong here*), introduced a new grammatical subject (*They* (*characteristics*) *include*), etc.

As a result, it is often difficult to clearly classify the strategy used by a particular participant when translating a specific sentence as either a SurfOS or SensOS strategy. This is because the same participant may use different strategies to translate different parts of the same sentence. Examples include Ukrainian participants avoiding typical English prepositional attributive constructions and using 'of'-phrases instead, even in the context of transformations.

On the other hand, as the above examples show, certain elements of a specific fragment can be translated using the SurfOS strategy even when the SensOS strategy is employed. It is reasonable to assume that SiT's effectiveness is precisely due to the flexible combination of these two strategies.

4.4.2. The impact of the source-text complexity on translation quality

The application of the SensOS strategy requires well-developed short-term memory, since this strategy involves the transformation of the ST structure. This may involve rearranging its fragments and performing other

necessary operations, such as converting active constructions into passive ones or vice versa, to ensure that the changed ST structure complies with the target language's norms. Since these operations are performed sequentially, some elements of the sentence must be stored in short-term memory until the previous rearrangement operation is complete. Consider the following ST sentence (in back translation):

Wild animals are forced out of their natural habitat by human activity (33).

If the translator decides to transform the passive sentence into an active one in the target language, they must perform the following operations: (1) move the semantic subject (*human activity*) to the beginning of the sentence, i.e. to the position of the grammatical subject: *human activity*; (2) move the predicate verb to the second position: *human activity are forced out*; (3) remove the auxiliary verb *are* (as a marker of the passive voice) from the phrase *are forced out*: *human activity forced out*; (4) remove the participle II marker (-ed) from the phrasal verb *forced out*: *human activity force out*; (5) add the third-person singular marker (-s) to the phrasal verb *force out*: *human activity forces out*; (6) move the semantic object *wild animals* from the third position (where it ended up after moving the semantic subject (human activity) to the beginning of the sentence in operation 1 and the predicate to the second position in operation 2) to the position between the two elements of the phrasal verb *forces out*: *human activity forces wild animals out*; (7) remove the preposition *by*, which connected the semantic subject in the passive sentence; (8) complete the sentence: *human activity forces wild animals out of their natural habitat*.

This hypothetical example clearly shows that such transformations require considerable effort. To effectively perform operation 5, for example, it is necessary to retain the result of operation 1 in short-term memory: the subject is now expressed by a third-person singular noun, requiring the addition of the ending *-s* to the predicate verb. Similarly, while waiting for operation 6 (moving the semantic object to the complement position), it is necessary to remember the content of previous operations and the changes that have occurred in the sentence structure. In particular, it is essential to keep in mind that the semantic object is currently in third position but must be moved back to be between the two elements of the phrasal verb, as required by English language norms.

In other words, at least eight operations must be performed to carry out the aforementioned transformations, which is a significant simplification since this hypothetical example is based on transformations within a single language. In real translation, however, equivalents must be sought simultaneously at different levels of the language system. This places a significant burden on the translator's cognitive processes and can lead to difficulties during TT generation.

The analysis of the TT generation process by participants confirmed the theoretical assumptions. The scope of the transformations that participants planned at the programming stage of the TT structure significantly affected its quality, and the TT generation process itself was characterised by obvious limitations in their ability to control it. This resulted in unmotivated pauses, backtracking, omissions, and distortion of ST information in the TT.

For example, consider the attempt to transform sentence 16 (see above) completely by converting the passive construction into an active one, rearranging the ST sentence fragments in the TT in the process. In Participant 1 (UMB), these operations consumed all her available effort, resulting in a loss of overall control over the generation of the TT, as evidenced by the numerous unmotivated pauses and corrections in her TT. Furthermore, she was so confused by her own transformational manipulations that she could not retain the key term 'animals' in her short-term memory and did not notice its semantic replacement with another key term, 'people'. Consequently, her translation lost all meaning (the ellipses indicate unmotivated pauses and unfinished attempts):

Logging and excessive… popu… population growth … makes ***people****… turn away from their… natural environment and closer towards people* (34)

Similar phenomena can be observed in the translation of sentence 35, which has been divided into three fragments for ease of analysis:

Čoraz častejšie v posledných rokoch (A)*, medzi panelákmi a rodinnými domami (B), bojujú s výskytom divožijúcich zvierat mestá a dediny* (C) (35).

The predicted translation using a literal approach looks like this:

More and more often in recent years (A), among apartment blocks and houses (B), have struggled with the presence of wild animals towns and villages (C).

Evidence of cognitive overload in the translation of these and other fragments includes unmotivated pauses and poor translation choices. The overall quality of the translation is low; on average, the UMB group made 21 information deviations per participant, which change the meaning of the source text (ST). The fluency of the TT delivery is also negatively affected by a significant number of unmotivated pauses lasting over two seconds, of which there were an average of thirty. Each of these pauses signals the emergence of translation problems, with which the participants were not always able to cope. For example, Participant 1 generally misinterpreted Fragments A and B (*Still ... there are many towns and cities… and villages… built in the last years…*). Participants 2 and 3 failed to understand the meaning of fragment C and were unable to complete its translation (*and many people fight… with …*), as was participant 4 (*still with many animals emerging in towns and…*). Participant 4 managed to produce a grammatically and semantically complete translation of fragment C (*there are a lot of wild animals living there*), which, however, had nothing to do with the meaning of the ST.

As converting the ST configuration requires a significant amount of effort, the existing resources are not always sufficient for effectively managing ST data and conveying it to TT. In addition to distortions in ST content, ST information is often missing from TT.

For instance, in rendering the sentence:

Medzi ľudí stále častejšie zablúdi aj poľovná zver ako srnky či diviaky (36),

with the predicted version:

Among humans, more and more often, are also wandering hunting animals, such as roe deer and wild boar,

A variety of omissions were recorded. These included the following (omitted elements are shown by ellipses): P1 *–There are also… more examples of… animals that are coming to towns, for example, deer or boars*; P2 – *There are … other wild animals… wild animals such as does or boars*; P3 – *but also we can find there… other animals as deer or boars*.

The proportion of omissions varies between the two groups and is clearly dependent on the prevailing translation strategy. With the SurfOS strategy, for example, the probability of an omission decreases as the interpreter

moves sequentially from left to right, attempting to translate every element encountered. While this approach creates many other problems, the probability of omissions is negligible. However, in the case of transformations and the associated rearrangement of TO sentence components, there is an increased risk of certain blocks of meaning being lost due to problems with their temporary storage in short-term memory. Therefore, omissions are mainly an issue for the UMB group, where the proportion of ST content loss reaches 16%.

The problem of there being insufficient effort available to solve problems that arise during the application of transformations is significantly aggravated by the structural and semantic complexity of ST. This can be illustrated by the example of a complicated sentence containing subordinate clauses, as well as an inverted grammatical subject and predicate in the final position (see fragment C).

Inde zasa, problémy s premnoženými divými holubmi alebo netopiermi (A), ktoré rôzne škáry a otvory vyhľadávajú na budovách, kde zahniezdia (B), riešia samosprávy (C) (37),

with the predicted version:

Elsewhere, problems with overpopulated feral pigeons or bats, which different cracks and holes seek out in buildings to roost in, are dealt with by local authorities.

Processing this sentence required considerable effort, resulting in cognitive overload and a series of omissions and distortions. Several participants omitted almost entirely the content of fragment B: P1 – *because they are on the buildings*, P2 – *search for enclosures*. Others distorted its content (P2 – *because they are emerging in people's houses through small holes which can be found in buildings*), did not finish the clause (P3 – *which search for holes where they can live and …*) or skipped this fragment altogether.

Sometimes, the participants became so immersed in their own interpretations of the ST that they ventured into its expanded retelling, adding information not present in the original. Conversely, they produced a set of words that were present in the original, but which did not constitute a meaningful whole.

This can be illustrated using sentence 38 as an example:

Svojou činnosťou v lesoch ich k tomu neraz nútia sami ľudia (A), *ktorým potom prekáža* (B), že k ich domovom sa tlačia zvieratá (38),

with the predicted version:

By their activities in forests, they are often forced to do so by humans themselves (A), *who then resent* (B) *that on their homes are crowding in the animals* (C).

In rendering fragment A, P1 suggested the version *because ... we are not only one… that… endanger animals in… forests*, which is a far cry from the ST original meaning.

Although the ST was constantly in front of the translators' eyes during the SiT process, they had to solve constant problems, as evidenced by unmotivated pauses in their delivery. This exhausted them so much that their TTs often resembled the texts they had heard, but were unable to recall accurately. Therefore, when translating complex sentences in particular, their translations often contained additions that were not present in the source text.

This can be illustrated using sentence 39 as an example:

Pri ochorení touto nebezpečnou nákazou stráca plachosť (A), *ktorá je pre ňu typická* (B), *a k ľuďom prichádza* (C) (39),

with the predicted version:

In falling ill with this dangerous disease, it loses the shyness that is typical of it and to humans comes.

In delivering this sentence, P1 abbreviated it so much that it lost all connection to the ST: *Can say that when there are animals with rabies it couldn't be*.

It may corroborate the Moser-Mercer's (1995) assumption that complications arising from the translation of complex sentences may be associated with participants' propensity to translate in a linear fashion, from left to right. This tendency involves allocating semantic and referential significance to each successive word encountered in the ST. Such an approach can result in a multitude of translation errors, repetitions and self-corrections. Attempting to harmonise the exegesis of numerous elements of the ST in order to discern the author's intent, select the appropriate TT structure and execute the necessary transformations places an undue burden on the information processing apparatus and memory retention faculties.

4.5. Conclusions

Our study aimed to determine the strategies (surface-oriented or sense-oriented) that student translators use in sight translation, the factors that influence their choice of strategy, and the consequences of applying these strategies.

The results show that both strategies were evident in all participants' translations, regardless of the source language, and that the consequences of their application differed.

With the surface-oriented strategy, there are fewer omissions and additions. However, this strategy makes it difficult to select equivalents because the context is significantly narrowed as the translator moves from left to right, word by word, which restricts the anticipation mechanism's functionality. Consequently, the meaning of the source text is often deviated from, and unmotivated pauses occur, which are associated with the difficulty of finding equivalents in the target language in an unclear context.

Conversely, when using a sense-oriented strategy, there is a significant increase in the frequency of omissions, additions, and unmotivated pauses during transformations. This strategy does not always make it possible to keep track of and coordinate the different parts of the target text during these transformations, which can result in them being lost, or even the meaning of the original message as a whole.

Several factors have been identified as influencing the choice of translation strategy. The first of these is the level of proficiency in the target language. The higher the proficiency level, the more likely it is that a sense-oriented strategy will be used, regardless of the source language. This is because a higher level of language command provides a greater range of options for selecting equivalents at different levels of the language system. This pattern is evident in both the intergroup aspect (KKNU vs UMB) and within each group.

The second factor is the syntactic structure of the source text. The closer the two languages' structures are, the more likely a literal translation will be used, as this strategy requires the least effort. However, if there is a growing discrepancy between the source text structure and the target text's potential syntactic model, the source text structure must be transformed, along with the associated syntactic and morphological changes. Such operations require

considerable effort and may exceed the translator's available stock of effort, resulting in forgetting and the subsequent omission of some source-text fragments and/or loss of their coordination when generating the target text. This can lead to an increase in unmotivated pauses, a slower pace of the target-text delivery, and the omission or distortion of some source-text blocks of meaning, potentially resulting in their complete loss or refusal to finish translating the corresponding fragments.

Although the goal of translator training is clearly to acquire a sense-oriented strategy, the use of a surface-oriented strategy is not necessarily a negative characteristic of a student translator or an inappropriate approach to translating a particular fragment of the source text. Even when the syntactic structure of a fragment did not lend itself to being copied into the target text, some participants managed to preserve the meaning of the source text by making minimal adaptations to it in the target text, albeit with some stylistic losses. Furthermore, when translating syntactically complex source texts, participants often employed both strategies for different fragments, flexibly considering the specificities of each. This intuitive approach enabled them to allocate their resources more efficiently to solve the overarching challenge of translating the entire source text.

These conclusions have certain implications for translator training. Clearly, student translators need to master both strategies and understand the conditions and specifics of their application. To develop this awareness, it seems appropriate to include work with source texts of different syntactic structures in the training programme. Using these texts as examples, it would be beneficial to demonstrate how the structure of the source text can be transferred into the target text, as well as the necessary adaptations to ensure compliance with the target language's norms. Conversely, to teach the necessary transformations of source texts and coordination of the corresponding actions, it is advisable to automate the relevant operations in exercises and tasks as much as possible to free up short-term memory and conserve effort. This should provide the necessary conditions for developing the ability to apply both strategies flexibly depending on the specific translation conditions.

This assumption needs to be tested experimentally, which we see as one of the prospects for further research.

CONCLUSIONS FROM PART 1

The experiments described in the first part of this monograph enable us to draw some preliminary conclusions about the psycholinguistic aspects of translation and interpreting mechanisms.

Natural capacity for translation/interpreting. There is evidence to suggest that this ability is innate. In Experiment 1 (Chapter 1), a bilingual child who could neither read nor write demonstrated significant progress in developing his translation skills by employing many of the strategies and techniques outlined in translation studies literature. This suggests the presence of innate mental algorithms.

The development of translation competence in very young bilinguals appears to be linked to the gradual differentiation of their two mental lexicons. Initially, they may use words from both lexicons in the target text, but they eventually learn to inhibit the source language one. Due to the limited size of both lexicons, it is sometimes difficult to find exact equivalents for words in the source language. Words with the closest meaning are used, even if this similarity is only superficial. Other strategies are employed to compensate for this, including coining new words and explaining their meaning in the target language.

The balance between literal and interpretative translation varies depending on the direction of transfer. There is a tendency towards a more literal approach when translating from a common language into a less common one. This may be linked to the unequal development of the two languages, which allows for greater flexibility in transforming the source text when translating into language A, but less flexibility when translating into language B.

Sources of difficulty in translation/interpreting. Experiment 2 (Chapter 2) revealed four sources of ambiguity in interpreting a foreign-language source text: differences in word-formation principles between the two languages; interlanguage and intralanguage interference; and a lack of background knowledge.

To minimise the negative impact of a lack of background knowledge, the structure and content of translator and interpreter training should be

redesigned to integrate all the disciplines within the curriculum. Reducing the impact of the other three factors may require exercises and tasks to be restructured to include elements that cause interference and provoke student errors, and to neutralise the negative effects through subsequent student activities.

Strategies for overcoming translation/interpreting difficulties. Experiment 2 also helped to identify seven strategies for dealing with ambiguity: transcoding; literal translation; associative development; logical thinking; contextual guessing; improvisation; and withdrawal. While all but the last are theoretically capable of solving problems, students still need to be taught how to use them rationally. Experiment 2 showed that students use transcoding for ambiguous words of Greek or Latin origin. They resort to literal translation when the meaning seems to be clear, sometimes adding or deleting words. They also use associative development, logical thinking, contextual guessing and improvisation, but with limited success. These strategies should be systematically contrasted in class to help students differentiate between them.

The translation process vs sight translation process. Experiment 3 (Chapter 3) shows that the processing capacity of individuals is rarely saturated in written translation. The effort applied at each stage — reception of the source text, its analysis, decision-making, and production of the target text — is sequential and minimal. Therefore, the available capacity is usually sufficient to produce acceptable quality. The source and target texts are always available and do not need to be memorised.

Conversely, sight translation is a demanding task for interpreters. They must perceive, analyse and understand the source text, and produce the target text smoothly (without pausing, false starts, repetitions or self-corrections), all while working under the pressure of simultaneous reading and speaking. This requires good short-term memory and well-developed coordination effort. However, the retention time of this type of memory is often insufficient to meet these requirements.

The quality of sight translation therefore depends crucially on the interpreters' ability to coordinate their parallel efforts effectively in order to avoid saturation of their processing capacity. This ability can be developed through special training, the nature of which requires a separate study.

Strategies for translating from a mother tongue (Ukrainian and Slovak) into a foreign language (English). Experiment 4 (Chapter 4) confirmed that student translators, irrespective of their native language, use both the surface-oriented (literal translation) and sense-oriented strategies in their sight translation.

The application of the surface-oriented strategies resulted in fewer omissions and additions, but restricted the anticipation mechanism's efficiency. Consequently, it deteriorated the ability of finding equivalents in the target language in an unclear context.

On the other hand, the use of the sense-oriented strategy, being the ultimate goal of translator/interpreter training, promoted omissions, additions, and unmotivated pauses. In application of this strategy, related to the transformation of the source-text structure, the students often failed to coordinate the different parts of the target text during these transformations, which resulted in the deterioration of the target text quality.

It was found that the choice of translation strategy depends at least on two factors: the students' level of proficiency in the target language (the higher the proficiency, the more likely the use of the sense-oriented strategy, and vice versa) and the syntactic structure of the source text. The closer the two languages' structures are, the more likely is the use of a literal translation approach. However, the discrepancy between the source text structure and the target text's potential syntactic model requires appropriate transformation to be carried out. Such transformations call for considerable effort and may exceed the translator's available capacity, resulting in an increase in unmotivated pauses, a slower pace of the target-text delivery, and the omission or distortion of the source-text meaning.

A surface-oriented strategy is not necessarily an inappropriate approach to translating a particular fragment of the source text. Even when the syntactic structure of a fragment is not suitable for literal translation, it is possible to preserve both the general structure and the meaning of the source text by making minimal adaptations in the target text. When translating syntactically complex source texts, both strategies may be used for their different fragments to economize the available effort.

These conclusions have certain implications for translator training and may be considered in compiling the system of exercises and tasks for a specific translator/interpreter training course.

PART 2

TECHNOHUMANISTIC ASPECTS OF TRANSLATOR AND INTERPRETER TRAINING IN ONLINE EDUCATION

CHAPTER 5
THE HUMAN-TECHNOLOGY RELATIONSHIP AND INFORMATION COMMUNICATION TECHNOLOGIES IN EDUCATION

5.1. Human-technology interaction theories

Online education is an indisputable corollary of our progression into a society increasingly dependent on technology. Though there are different ideas about human-technology evolution (see e.g., Stone 1995; Habermas 2003; Fukuyama, 2002; Evans, 2011; Hopkins, 2012; Tirosh-Samuelson, 2012; Kumm and Berbary, 2019; Sterling, 2020; Andersson, 2022; Cole-Turner, 2022; Susen, 2022; Benvenga, 2023; Ellul 2024), we will use only one of them, technohumanism, to analyse machine-student relationships in online translator and interpreter training.

Technohumanism (Epstein 2012; Harari 2018), or digital humanism (Coeckelbergh, 2024), is an interdisciplinary field embracing issues of human-technology and human-human relations. It looks for the mutual and balanced development of humans and technology, the humanistic meaning of technological evolution, and is based on the ideal of a better society (Prem, 2024). To be effective, a digital humanism should consider specific humans and specific technologies in their mutual entanglement (Lucci and Osti, 2024), which, in our case, means student translators and MT programmes.

To provide for the abovementioned balanced development of human-technology relations, we have to answer a number of crucial questions (Pym 2013). What happens to humans when their mental and psycho-cognitive capacities become more technical, and what is left of human beings after their intellectual functions have been transferred to technology? To make it more specific, what is left of the students' translation competence after they have reassigned their translation skills to technology, especially in online courses? Before considering this question, it seems appropriate to review the issue of information and communication technologies (ICT) in education in general.

5.2. Technology in translator and interpreter training

To avoid misunderstanding in the following discussion, it seems appropriate to explain the meaning of key terms used here (Ericsson & Simon, 1984; Underwood et al., 2001; ISO 171000, 2015; Mellinger, 2018). They include: *human translation* – done by a human being; *machine translation* – done by a computer programme; *transhuman translation* – which additionally involves technological means (machine translation (MT), computer aided translation tools (CAT, translation memory (TM), etc.); *pre-editing* – removing from the source text (ST) specific features that may be problematic for MT; *post-editing* – editing the MT target text (TT) or a comparison of the ST and TT to make revisions; *editing* (*review*) – making revisions in TT without comparing it with ST; *revision* – a check of the TT against the ST; *Think-aloud Protocol* (TAP) – a data-gathering method where the participants verbalise their thought process in translation.

Research on the use of ITC in translator and interpreter training (Gaspari et al., 2015; Bogush, Korolova & Popova, 2019; Bashmanivskyi, Usatyi, Diachenko & Khalin, 2019; Man et al., 2020; Niño, 2020; Bihych & Strilets, 2020; Bowker, 2021; Rodríguez Vázquez, Kaplan, Bouillon, Griebel & Azari, 2022; Chernovaty and Olkhovska, 2022; Kelly & Hou, 2022; Matviyenko, Pershukova, Vasiukovych & Kudina, 2022) deals with a wide range of issues Among them – the categorisation of MT programmes, knowledge and skills required for the ICT use in translation; the attitude of translators, translation service providers, translator trainers, students and academics to the ICT use in teaching; the impact of MT on accessibility for people with special needs; the structure of the interpreter technological competence; the functionality of ICT tools for specialised translation; the impact of ICT tools use on the cultivation of cognitive competencies.

A number of authors (Bashmanivskyi, Usatyi, Diachenko & Khalin, 2019; Hasibuan, 2020; Omar & Gomaa, 2020) investigated the efficiency of post-editing and the use of MT in general, having confirmed the validity of both. Conversely, other authors' findings (Lee, 2022; Zhou, Zhao & Groves, 2022; Sugiyama & Yamanaka, 2023; Wang, 2023; Rico Pérez, 2024; Guerberof-Arenas, Valdez & Dorst, 2024; Dai & Liu, 2024) were not so convincing. On the one hand, they claimed the combined use of several ICT tools (such as DeepL-and-ChatGPT browser-based service or DeepL plus text-to-speech synthesis plus audio/video synchronization) to be good for a beneficial educational

environment. On the other hand, they also found some MT problems, specifically with punctuation and sentence complexity, claimed the clear superiority of humans over machines in creative aspects of translation, found the positive impact of teacher-student communication on students' creativity in post-editing and focused on the auxiliary role of MT in professional context where it is not used as a full replacement for human translation.

A considerable number of authors (Pym, 2013; Kenny & Doherty, 2014; Mellinger, 2017; Rodríguez de Céspedes, 2019; Schmidhofer & Mair, 2019; Lemish et al, 2020; O'Brien & Rossetti, 2020) advocate for the integration of MT systems into translator training curricula, as well as the conceptualisation and execution of a novel, translator-oriented MT syllabus. This would mean a more balanced approach to MT use, and would make the most of translators' skills and knowledge.

However, the problem is that different authors interpret the concept of a 'balanced approach' differently, meaning its implementation can take different, even opposite, forms. Proponents of the complete fusion of humans and technology (Teixeira & O'Brien, 2017; Jiménez-Crespo, 2020) argue that the extent to which computers are now involved in translation means that the concept of 'translation' itself should be reconsidered as a form of human–computer interaction, including in the case of literary translation.

The idea of introducing a technological component across all translation-related disciplines has been logically derived from the continuous development and improvement of machine translation programmes and other forms of interlingual automation. Some authors (Pym, 2013; Mellinger, 2017; Schmidhofer & Mair, 2019; O'Brien & Rossetti, 2020) argue that this approach to learning may be more effective than the traditional teaching of technology use in translation within individual courses or modules.

It is difficult to predict the effectiveness of a complete technology-driven restructuring of educational content in the future, but there are currently serious concerns about its potential negative impact on the development of human translation skills.

Despite the undeniable successes in improving the effectiveness of machine translation (MT) programmes, serious doubts remain about their advantages over professional translators.

The debate over whether human or machine translation is more effective remains unresolved, as studies offer conflicting conclusions. Some

researchers argue that human translation is clearly superior (Loock, 2018), while others find no notable difference between the two methods (Daems, Vandepitte, Hartsuiker & Macken, 2017). Some studies suggest that post-editing MT target texts can actually be more efficient (Yang, Wang & Yuan, 2021), whereas research involving Korean university students editing Google Translate outputs of medical texts found the process to be ineffective (이상빈. 2018). The inefficiency was linked to poor pre- and post-editing practices, overreliance on dictionaries, and excessive focus on non-technical terms. The study concluded that strengthening students' core translation skills should take precedence over training in post-editing.

Other scholars (Moorkens, 2018; Mossop, 2019; Poirier & Roy, 2023; Boulanger & Gagnon, 2023) emphasize the shortcomings of machine translation. Specifically, it was found that enthusiasm for neural machine translation may be overstated, particularly when compared with older statistical systems across different languages. The authors argue that human involvement is still essential – though not without its own flaws. They stress the need for translators to critically engage with machine-generated texts, as human translators uniquely shape social reality. This view echoes the assumption that increased use of translation technology may be undermining translators' professional status.

Overall, while many scholars (Alonso & Calvo, 2015; Burchardt et al., 2016; Ruokonen & Koskinen, 2017) recognize machine translation as a major innovation, there remains caution about its long-term role in enhancing translators' creativity and productivity. In particular, it was found that while most translators viewed machine tools positively, some reported more nuanced or mixed experiences. The broader trend points toward transhuman translation – a model that integrates human translators and technology not to replace, but to empower them, offering opportunities for their creative and critical engagement.

A key challenge in translator and interpreter education is finding the right balance between developing students' ICT-related translation/interpreting skills and maintaining their core human competencies. In online courses, a concern arises over students potentially relying too heavily on technology, which could undermine their human translation and interpreting abilities. To address this, it's important to first understand how often students use ICT tools in situations where such use is discouraged, and what methods they employ to do so. The reviewed literature reveals a gap – there are

no studies focused specifically on how students secretly use machine translation (MT) during online assessments designed to test their human translation/interpreting abilities without technological aid. Lu and Han (2023) examined whether automated MT metrics could evaluate human interpreting performance and found some metrics moderately to strongly aligned with human scoring, particularly in English-to-Chinese interpretation. However, this does not pertain to assessing how much MT is actually used by students during human-focused tasks. Research by Hamid, Terng, Ling, and Kaur (2023) indicates that most educators are against the use of MT in exams, even though they recognize its value for learning. This raises a key issue: how can we accurately gauge the extent of MT usage by individual students during assessments?

As previously mentioned, this issue is particularly relevant to Ukraine, but given the rapid growth of online education, it is likely to become increasingly important worldwide in upcoming years.

CHAPTER 6
CONTOVERSIES OF THE HUMAN-TECHNOLOGY RELATIONSHIP IN ONLINE TRANSLATOR AND INTERPRETER TRAINING

6.1. Introduction

The training of translators and interpreters at Ukrainian universities has been conducted online for a period of four years. It is common knowledge that a significant proportion of the student body frequently utilise MT, particularly in their scholastic assignments and assessments. The development of students' professional competence is undoubtedly enhanced by their ability to use automated translation tools. However, it is important to acknowledge that this competence extends beyond the mere utilisation of these tools. Insufficient development of the relevant neural network in students' minds, due to an absence of the minimum required amount of independent (without MT) translation experience, results in them becoming mere extensions of the machine, incapable of translating independently at a professional level. This assertion is corroborated by the behavioural observations of students during online translation practice classes in the absence of machine translation systems.

6.2. Problem statement

The move to online teaching in Ukraine was initially driven by the need to adhere to quarantine restrictions due to the pandemic, but it has persisted due to the ongoing war. The advent of this novel learning environment has precipitated a marked intensification in the students' utilisation of ICT, albeit with concomitant complications. These pertain, in particular, to the active employment of MT systems by prospective translators and interpreters to expedite their academic endeavours, as well as to the evaluation of students' non-MT translation and interpreting competencies (see also the analysis in Chernovaty, 2024b and Chernovaty, 2024d).

Notwithstanding the broadly beneficial role of Information and Communication Technology (ICT) in the field of education, the employment of MT in the virtual training of prospective translators and interpreters has also given rise to certain issues. Broadly speaking, the core of their professional proficiency growth is the establishment of a suitable neural network in their brains via carrying out the pertinent task, i.e. in our situation, translation or interpreting. Common issues with translation (or interpretation) re-emerge in some form in every text. Consequently, in the pursuit of translation and interpreting, the majority of which is undertaken autonomously, the mind progressively cultivates the pertinent solution algorithms, thereby contributing to the evolution of the progressively intricate neural network that ensures the enhancement of the translator/interpreter's professional competence.

In the context of online learning, however, a student has the ability to immediately translate any written material by simply pressing the relevant key. Consequently, there are grave concerns about the potential for developing complete translating skills in such circumstances. During this momentary operation, the student's mind remains passive. This is because it is not engaged in ST processing. It is also not engaged in translation problem identification. Nor is it engaged in the related decision-making concerning many levels. These levels include the semantic, lexical, grammatical, stylistic and logical levels. The student's mind is also not engaged in TT generation. The act of depressing a key on a keyboard does not engender the establishment of a commensurate neural network that facilitates the translation process in the student's mind. Consequently, the cultivation of translator proficiency remains unfulfilled.

As the allure of expediency proves overwhelming for the majority of students (Yang, Wang and Yuan, 2021), the prospect that the paucity of analytical and cognitive exertion will be counterbalanced by post-editing the MT text (or other subjective factors) is seldom substantiated.

The calls by educators for homework to be free of mechanical tasks are, as a general rule, ineffectual, due to the strong temptation to save time for the majority of students, which proves irresistible. This has been demonstrated through experimentation too: one study (Yang et al., 2021) discovered that learners think the hours and effort saved by using MT is more valuable than the general disadvantages of MT. The idea that learners might make up for the reduction in analytical and cognitive practice by revising the MT target

text is seldom confirmed. The majority of students tend to restrict their work to simply swapping a few words in a sentence for their synonyms, if they have any.

A prohibition on the utilisation of MT in domestic tasks is likely to be counterproductive – students will readily circumvent it by incorporating a third language, for instance. For the sake of illustration, the device converts the ST from English into German and then – from German into Ukrainian. It would prove more arduous for pedagogues to substantiate the MT manipulations in this particular instance.

At the outset, students merely submitted the ST to the MT system and directed the translation to their teachers, frequently without even perusing it. Members of the teaching faculty, exasperated by the substandard quality of the translation tools and the blatant indications of academic dishonesty, responded with punitive measures. Consequently, students progressed to more sophisticated MT strategies, employing rudimentary post-editing techniques, such as substituting select words in the MT text with their synonyms, without effecting any substantial alterations in sentence structure. As educators gradually became more skilled at spotting the indications of MT in these adapted texts, pupils also honed their tactics for concealing MT, making it progressively challenging for teachers to demonstrate its utilisation. Consequently, educators refined their aptitude in discerning the hallmarks of MT in students' endeavours. As the principal impetus for students to utilise MT is to economise on time, this "arms race" should, in theory, become moot when the time expended by students on disguising the use of MT exceeds the time spent on translation without the assistance of a machine.

In its nascent stages, the utilisation of MT was confined to the realm of translation. However, as time progressed, advancements in computer technology coincided with the enhancement of students' IT proficiency. Consequently, manifestations of MT began to emerge in students' interpreting, particularly in its consecutive and sight-translation modalities. Therefore, it is necessary to investigate how widespread the practice of using MT is among students in online translation and interpreting, especially during assessments, and what strategies are employed.

The subsequent investigation in this and other chapters is founded on the information gathered from the students of the Faculty of Foreign Languages at V.N. Karazin Kharkiv National University, one of the most established institutes for translator and interpreter training in Ukraine. The objective

of this investigation was to ascertain the scope of students' surreptitious utilisation of MT in the management of their non-MT translation and sight-translation competencies, the approaches employed in such usage, and the indications through which educators can identify it. The formulation of appropriate recommendations was anticipated based on the results of this study.

6.3. Covert post-editing in translation

The covert use of MT in translating individual home assignments and tests is quite widespread. Analysis of a mid-semester translation test taken by 20 MA students showed that their TTs coincided with the corresponding MT TTs 71.25% of the time. Meanwhile, only 10% of the students had a match rate of less than 50%.

The MT borrowings without significant changes are illustrated in Table. 6.1 (differences between participant 1's TT and the MT are highlighted in bold).

Table 6.1: Comparison of MT's and participant 1's TTs.

MT	Participant1's TT
Common law occupies the lowest rung in the hierarchy of law-making sources. In the past, there was an opinion that in a conflict situation, the common law has more force than the statutory law. However, the principle of legislative power prevailed. As a result, the legislator has the right to abrogate or modify the common law at his discretion.	*Common law occupies the lowest rung in the hierarchy of* ***legislative bodies****. In the past, there was an opinion that in a conflict situation, the common law has more force than the* ***legislati****ve law. However, the principle of legislative power prevailed. As a result, the legislator has the right to abrogate or modify the common law at his discretio*n.

As is apparent from this illustration, Participant 1's interpretation is almost word-for-word with the machine translation, with two synonymous replacements (*legislative bodies* in place of *law-making sources* and *legislative* instead of *statutory*). The obvious nature of these borrowings, and the fact

that participant 1 used MT in the course of their independent work, does not require proof.

Other participants use more sophisticated techniques to conceal their reliance on MT. The example of one of these is given below (the differences between participant 2's TT and the MT are shown in bold).

Participant 2: *Common law occupies the lowest* ***level*** *in the hierarchy of* ***sources of lawmaking****. In the past, there was an* ***idea*** *that in a conflict situation, common law has more force than* ***legislative*** *law. However, the principle of* ***supremacy of the legislature won out****. As a result, the legislator* ***can cancel*** *or* ***change*** *the common law at his* ***own*** *discretion.*

Here we can see a considerable number of synonymous and pseudo-synonymous substitutions. These include the use of more common *level* instead of the less frequent *rung*, the synonymous *idea* instead of *opinion, legislative* instead of *statutory*, *supremacy* instead of *power*; the application of informal lexemes in place of formal ones: the phrasal verb *won out* instead of *prevailed*, *can* in place of *has the right to*, *cancel* instead of *abrogate*, and *change* in place of *modify*. We can also see the permutation (*sources of lawmaking* instead of *law-making sources*) and addition of the adjective *own* in the phrase *at his discretion*.

In view of the substantial quantity of lexical substitutions, text comparison software will discover a reduced amount of similarity between the two texts. Nevertheless, the reliance on the MT is evident, as both texts are equivalent in composition, with the participant successively substituting individual lexemes without substantially altering the sentence structure.

A more complicated strategy is transforming the MT TT (see an example below).

Participant 3: *In the hierarchy of law-making sources, common law occupies the lowest step. There was a thought earlier that in a situation of conflict, the common law has more power than the legislative law. However, the principle of legislative power prevailed. Thus, the legislator's right includes the power to cancel or change the common law in accordance with their decision.*

In this case, we see the permutation of the phrases *In the hierarchy of law-making sources* and *common law occupies the lowest* in the first sentence, paraphrasing *conflict situation* into *a situation of conflict* and *at his discretion* into *in accordance with their decision*; the transformations of *legislator has*

the right into *legislator's right* in the second sentence. There also numerous synonymic substitutions (such as *step* for *rung*, *power* for *force*, *legislative* for *statutory*, *thus* for *as a result*, *cancel* for *abrogate*, *changes* for *modify*) and one addition (*includes the power*) related to the transformation of the last sentence.

The overall coincidence rate between the two texts will be low, even though the text comparison software will show this rearrangement of text fragments. Nevertheless, arriving at a conclusion regarding the utilisation of MT is a relatively uncomplicated process, given the striking similarity between the lexical composition of the two texts. However, if the changes to the structure of the text are accompanied by substitutions of words that have the same meaning and other techniques used in MT, the text comparison software may recognise such a text as original. It is in fact the result of MT-TT post-editing. This approach can be beneficial for developing students' translation competence (see below for details).

6.4. Hidden post-editing in interpreting

For a time, educators assumed that machine translation (MT) plagiarism was limited to translation tasks and not feasible in interpreting due to time constraints. However, this belief was eventually disproven. The initial signs of MT misuse emerged in sight translation exams, where students were given a short time to read the ST displayed on a screen before interpreting. In a while, educators observed a notable progress in students' interpreting performance. With grades assigned immediately after delivery, the opportunity for comparison of students' interpretations with machine translations or with each other's outputs was non-existent. Later reviews of audio recordings, compared with MT results, revealed that during the 30-second preparation window, students were uploading the ST to MT engines and reading the translated text from their monitors.

At first, there was some expectation that this tactic wouldn't work for consecutive interpreting, where students had to listen to the ST, take notes, and interpret from those notes without seeing the text. But it soon became evident that students were using voice-to-text software to transcribe the ST, which improved their performance noticeably. The post-delivery analysis confirmed that instructors were now contending with MT use even in this form of interpreting, as students were simply reading pre-translated texts from their screens.

In response, most educators began analysing recorded student deliveries after the fact and comparing them with MT outputs. This method closely resembled the approach used in sight translation, revealing that students continued to exploit MT in much the same way.

6.4.1. Hidden post-editing in sight translation

In order to check the frequency of covert application of MT in tasks that did not allow it, we analysed students' TTs during the midterm test of sight translation.

The participants were made up of 13 BA students (in their fourth year) and 10 MA students (in their first year) from the School of Foreign Languages at V.N. Karazin Kharkiv National University. The BA students focused on scientific and technical translation, while the MA students specialised in copyright protection. The study involved assessing sight translation. We analysed the participants' intermediate-test TTs within the above-mentioned subject areas. The aim was to identify the features of MT and the strategies of its possible covert use.

Participants were shown a Ukrainian text of 186 words as part of the test. They were allotted a brief period in which to peruse the ST, after which they were invited to undertake its sight translation into English. The presence of MT features and covert MT use strategies in each student's translation was analysed. In order to ascertain the extent to which the participants' TTs correspond with the MT TT, we employed a computer programme, which is able to demonstrate the percentage of similarity between the two texts and the alterations made by the participants.

The finding of evidence of covert MT use was made in 38% of the participants' TTs on average. This signifies that, in the limited time given for examining the ST, the contestants had succeeded in operating it via an MT engine, and subsequently reading the MT TT from the display using various clandestine tactics.

The most elementary stratagem entails sporadic synonymic lexical substitutions in the MT TT. To elucidate this stratagem, let us contemplate fragment 1 of Participant 1's (P1) TT, who utilised the DeepL Translate version (the discrepancies between the two texts are exhibited in bold).

Table 6.2: Fragment 1. Comparison of target texts translated by machine (MT TT *DeepL Translate*) and participant 4 (P4 TT)

MT TT (*DeepL Translate*)	P4 TT
In Denmark, a coal-fired thermal power plant has achieved a net electrical efficiency of over 47%, and the overall efficiency of the plant has reached 91% in electricity generation and district heating. At the multi-fuel thermal power plants outside ***of*** *Copenhagen, a net electrical efficiency of 49% can be achieved. The overall efficiency of a power and district heating plant can reach 94%.*	*In Denmark, a coal-fired thermal power plant has achieved a net electrical efficiency of over 47%, and the overall efficiency of the plant has reached 91% in electricity generation and district heating. At the multi-fuel* ***combined heat and*** *power plan****t*** *outside Copenhagen, a net electrical efficiency of 49%* ***could*** *be achieved. The overall efficiency of the* ***combined heat and power*** *plant* ***with*** *district heating can reach 94%.*

As it follows from Table 6.2, P4 probably had some problems in the interpretation of the term *multi-fuel thermal power plants* which resulted in adding the supplementary words (***combined heat and***) to it and omission of the plural marker *-s* in the term *plant*. The same terminological collocation (*combined heat and power plant*) substituted the MT version *power and district heating plant*, probably for the same reason – the participant's ambiguity concerning the equivalent suggested in the MT TT. Other minor changes involved the deletion of the preposition *of* from the MT TT phrase *outside* ***of*** *Copenhagen*, synonymic substitution of *can* for *could* and the addition of *with* required because of the slight changes in the sentence structure. In view of the limited quantity of these replacements, it is not unexpected that the extent of consensus between these two TTs, as determined by the specially designed software (Compare text, 2023), is extremely high (80%). Indeed, the striking similarity of these texts is plain to see, even without complex calculations, and as a result, the teacher's conclusion regarding the use of MT should not cause any concerns.

Participant 5 (P5), who relied on the *Google Translate* version, made more substitutions in the translation of the same passage, both in terms of number and variability. Her TT is shown below (changes compared with *Google Translate* TT are highlighted in bold).

Table 6.3: Fragment 1. Comparison of target texts translated by machine (MT TT *Google Translate*) and participant 5 (P5 TT)

MT TT (*Google Translate*)	P5 TT
*In Denmark, a coal-fired thermal power plant achieved a net electrical efficiency of more than 47%, and the overall efficiency of the plant reached 91% for power generation and district heating. In thermal power plants operating on different types of fuel outside Copenhagen, a net electrical efficiency of 49% can be achieved. The total efficiency of the station for electricity production and centralized heat supply can reach 9*4%.	*In Denmark, a* ***coal power plant*** *achieved electrical efficiency* ***over*** *47%, and the* ***general electric*** *efficiency of the plant* ***has achieved*** *91%* ***during*** *power generation and* ***central*** *heating.* ***Power plants which work*** *on different types of fuel outside Copenhagen****, electrical*** *efficiency of 49% can be achieved. The* ***general electric*** *efficiency of* ***plant which generates electricity*** *and* ***central heating*** *can* ***achie****ve 94%.*

In this case, there is a greater variety of substitutions, accompanied by deletions, and additions of words.

The substitutions were mostly of synonymous type: *over* for *more than*, *general* for *overall, has achieved* for *achieved, achieved* for *reached*, *operating* for *which generates, total* for *general*, *station for electricity generation* for *plant which generates electricity*, *heat supply* for *central heating*, *reach* for *achieve, during* instead of *for.*

Deletions were generally used for the simplification of the MT TT terms, whose meaning the participant was not sure of. For example, she deleted two components (*-fired thermal*) from the MT TT terminological collocation *coal-fired thermal power plant*, one component (*thermal*) from the MT TT collocation *thermal power plant*, as well as the term *net* from the MT collocation *net electrical efficiency* in sentences 1 and 3. The deletion of the preposition *in*, which introduces the phrase *thermal power plants* in sentence 2 of MT TT, made the participant's sentence ungrammatical.

Additions involved supplementing the term *electric* (*general* ***electric*** *efficiency*) in sentences 1 and 3. It is probably related to the term *electrical efficiency* the participant copied from the MT TT in the first clause of sentence 1.

This augmentation of the array of transformations led to a substantial diminution in the incidence of mathematical coincidences in the two texts (50%), yet the indisputable fact that Participant 2 employed MT in her TT generation is irrefutable – as demonstrated by the extent of the sequences of wholly analogous words in the compared texts (the most protracted being 15 words in the second sentence, excluding the omission of *net*). These sequences are interspersed with sporadic instances of synonymous substitution.

Participant 6 (P6) employs a more inventive strategy, which involves the simultaneous substitution of vocabulary and transformation of sentence structure. The following example illustrates this approach.

Table 6.4: Fragment 2. Comparison of target texts translated by machine (MT TT *Google Translate*) and participant 6 (P6 TT)

MT TT (*Google Translate*)	P6 TT
After filing the patent application, following all the rules and obtaining the applicant's permission, the specialist submits the patent application to the Patent Office. Usually, he tries to submit an application as soon as possible, because in most jurisdictions, if two or more applications are submitted for the same object, only the party that submitted the application first has the right to receive a patent. In some jurisdictions, after a patent has been issued, its owner can apply for a "reissue" of the patent to correct errors in it.	*After filing the patent application, following all the rules and* ***getting*** *the applicant's permission, the* ***expert has to file*** *the patent application to the Patent* ***and Trademark*** *Office. Usually, he* ***has to file this patent*** *as soon as possible, because* ***under*** *most jurisdictions, if* ***there is*** *two or more applications* ***filed under*** *the same* ***patent****, only* ***one*** *party can* ***get*** *this patent,* ***and this is*** *the party* ***that filed*** *this application first.* ***Under certain*** *jurisdictions, after a patent is* ***filed****, the* ***holder*** *of the patent can* ***file an applications*** *for "****reissuing****" this patent to correct* ***some mista****kes in i*t.

In this fragment we can see substitutions and additions, accompanied by transformations of the sentence structure. The first ten words in sentence 1 coincide completely and then the participant starts substituting some words with their synonyms, specifically, she changes *obtaining* for *getting*, *specialist* for *expert*, *submits* for *filet*, *specialist* for *expert*, *application* for

patent, *in* for *under*, *submitted* for *filed*, *for* for *under*, *object* for *patent*, *in some* for *under certain*, *issued* for *filed*, *owner* for *holder*, *apply* for *file an application*, *reissue* for *reissuing*, *errors* for *mistakes.*

Additions involve adding modality by using *has to file* instead of *submits* in sentence 1 and instead of *tries to submit* in sentence 2. Besides, the participant added *and Trademark* to the name of the *Patent and Trademark Office* instead of its shorter version (*Patent Office*) used in the MT TT, introduced *there is* phrase to provide for the sentence structure transformation (see further), added the *of*-phrase to modify the term *holder* and mistakenly used the plural marker *-s* (*applications*).

As far as the sentence structure transformations are concerned, the participant turned the MT TT collocation *its owner* into *holder of the patent,* ungrammatically transformed the MT TT version *if two or more applications are submitted for the same object* into *if there is two or more applications filed under the same patent*, and *only the party that submitted the application first has the right to receive a patent* into *only one party can get this patent, and this is the party that filed this application first.*

Thus, numerous substitutions, additions and transformations have resulted in a significant (42%) decrease in the similarity between the participant's TT and the MT TT. This makes it difficult for teachers to prove the illegal use of MT if they are guided only by quantitative indicators.

A more sophisticated strategy involves the same student changing the MT engine while completing the same task. It is important to remember that students can quickly share different versions of various translation tool with each other while doing the same task or in the time between tasks. The choice of strategy by students may be influenced by the presence or absence of MT versions for the relevant fragments, given that the order and content of the fragments vary for different students.

For instance, Participant 7 (P7) likely did not possess an MT version of Fragment 1. This explains why she had to translate it herself, as evidenced by the low MT match percentage of 29%.

In fragment 2, however, there was a swift rise in the resemblance to MT (*DeepL Translate*) – 61%. Curiously, in the subsequent passage, P5 once again relied on MT, but on this occasion, *Google Translate*. This may be in the hope that the teacher will not check the same translation using different MT engines. A comparison of the MT TT and P5 TT is shown below.

Table 6.5: Fragment 3. Comparison of target texts translated by machine (MT TT *Google Translate*) and participant 7 (P7 TT)

MT TT (*Google Translate*)	P5 TT
The total ***of*** *known deposits that can be* ***mined with the help of*** *modern technologies, including highly polluting, low-calorie types of coal (for example,* ***brown,*** *bituminous), will* ***be sufficient*** *for many years. Consumption is* ***increasing****, and maximum production may be reached within decades. On the other hand, to avoid climate change, we may have to leave a lot of coal in the* ground.	*The total known deposits that can be* ***extracted using*** *modern technologies, including highly polluting, low-calorie types of coal (for example,* ***lignite or*** *bituminous), will* ***last*** *for many years. Consumption is* ***growing****, and maximum production may be reached within decades. On the other hand, to avoid climate change,* ***a lot of coal may have be left in the ground****.*

The degree of similarity between the MT TT and the TT of P5 in this fragment is 68%, but the usage of MT is obvious even without special calculations. We see chains of up to 15 identical words, with synonymous substitutions, occasional word additions, deletions or simple transformations. In the first sentence, we see the deletion of the preposition *of* and the substitution of the phrase *mined with the help of* in the MT TT with a more economical version *extracted using*, using a synonymic term *lignite* instead of *brown* (*coal*), and the verb *last* instead of more formal *be sufficient*. The tendency of substituting less formal for more formal words continues in the second sentence, where the participant uses *growing* instead of *increasing*. Finally, in the third sentence, the participant applied transformation converting active construction (*we may have to leave a lot of coal in the ground*) into a passive one (*a lot of coal may have be left in the ground*). Thus, the participant's overall approach remains uninventive, despite the change in the MT system in this passage.

A more complicated strategy is the simultaneous transformation of the sentence structure with the preservation of the MT TT lexical elements. To illustrate this, let's look at the target text of Participant 8 (P8).

Table 6.6: Fragment 4. Comparison of target texts translated by machine (MT TT *Google Translate*) and participant 8 (P8 TT)

MT TT (*Google Translate*)	P8 TT
In addition, in the USA, only its owner can apply for reissuance of a patent. One court case established the principle according to which the patent owner can add narrowly dependent claims to the ***issued*** *patent through the reissue procedure. This is because a patent with narrower dependent claims is less likely to be invalidated in the event of a trial. However, as a rule, it is the patent owner who must identify errors in the original claim, and thereby concede a certain amount of the claim.*	*In addition, in the USA, only* ***a holder of a patent*** *can* ***file an application*** *to* ***reissue this*** *patent.* ***In*** *one court case* ***there is*** *a principle according to which the patent owner can add* ***some specific points*** *to the* ***patent claim****, to the patent through the* ***procedure of its reissue****. This is because* ***to be found an effective****,* ***during the court hearing****,* ***the patent has less chances if it has less and specific points in the patent's claim****.* ***But, usually****,* ***if there are some mistakes*** *in the original* ***patent*** *claim,* ***then the*** *patent* ***holde****r can lose a certain scope of his claim.*

In the first sentence, we see the usual synonymous substitutions (*holder of a patent* instead of *its owner, file an application* instead of *apply, to reissue* instead of *reissuance*). The remaining sentences contain some specialized terms which the participant probably does not understand well enough, which forces her to make some transformations.

The unmotivated omission of the preposition *in* and the equally unmotivated addition of the phrase *there is* (instead of the predicate *established* in the MT TT) made sentence 2 ungrammatical. The situation worsened because of the participant's inability to interpret the terminological collocation *narrowly dependent claims* in the MT TT, which she unsuccessfully tried to render as *some specific points*. The attempt to render *issued patent* as *patent claim* distorted the ST meaning. In this sentence, we can also see the permutation – the reformulation of the phrase *reissue procedure* as *the procedure of its reissue*.

Sentence 3 turned out to be difficult for comprehension because of the terms *narrowly dependent claims* and *invalidated.* Thus, the participant, having copied the beginning (*This is because*), adds a vague ungrammatical phrase (*to be found an effective*), reformulates the MT phrases: *in the event of a trial* as *during the court hearing,* and *less likely to be invalidated* as *less chances if it has less and specific points in the patent's claim*.

Finally, in sentence 4, which begins with two synonymous substitutions (*But, usually* instead of *However, as a rule*), the participant simplifies the complicated (for her) structure (*it is the patent owner who must…*) using the simpler *if… then* clause (*if there are some mistakes in the original patent claim, then the patent holder can lose a certain scope of his claim*).

The mathematical indicators demonstrate a fairly high degree of translation independence on the part of P6. This is because 25% of matches were found between the two texts. However, their comparative analysis shows that she definitely relied on the MT TT in her sight translation.

An external sign of the use of simultaneous post-editing is the deliberate deceleration of the students' reading of the MT TT (to create the impression of vigorous cognitive activity in the process of sight translation), as well as the pauses before the words and phrases that are substituted or converted. Consider this approach with Participant 5's interpretation of Fragment 1 (see Table 6.3). Substitutions are shown in bold and pauses are indicated by dots.

In Denmark, a ...coal plant… a ***coal*** *power plant achieved…* (deletion of *net*) ***electrical*** *efficiency over 47%, and the general …****electric*** *efficiency of the plant has achieved 91% …****during*** *power generation and…* ***central*** *heating. (*deletion of *In thermal) …****Power*** *plants…* ***which****… work on … different types of fuel outside Copenhagen, …*(deletion of *net*) ***electrical*** *efficiency of 49% can be achieved. The general electric efficiency of …* ***plant*** *which…* ***generates*** *electricity and…* ***central*** *heating can achieve 94%.*

In this particular excerpt, the participant executed 18 lexical substitutions and transformations of MT TT. Notably, in 12 instances (equalling 67% of the cases), she paused deliberately prior to implementing the corresponding transformation. It is important to mention that unmotivated pauses are not usually typical of this participant. In the interpretation of this passage alone, she made only two such pauses, in addition to the twelve mentioned above.

In other cases, the use of pauses was for the concealment of the reliance on the MT. The subsequent excerpt from the interpreting of Participant 9 serves as an illustration of this methodology.

*As **for** 2012, the use of coal for electricity generation in the **US**… **was**… declining, …as… large… reserves of … natural gas, …produced by… … hydraulic… fracturing… of tight… shale formations, …because… **it** became available at low prices.*

This short text (36 words) is almost completely identical to the MT TT, with only a few differences in bold. This means that she read it from the screen. However, during the delivery of her TT, P7 made 14 unmotivated pauses. Some of these can be explained by her uncertainty over how to read the specific word correctly. In other instances, she erroneously used incorrect words, but swiftly corrected herself. In all other cases, she had the MT-generated TT in front of her and could read it without stopping, but she intentionally paused to create the impression of an unready interpreter. This strategy is effective when the teacher gives the mark immediately after listening to the student's performance.

The above study enables us to draw some preliminary conclusions. These are not intended to be exhaustive, but could form the basis of more comprehensive research.

6.5. Conclusions

The use of covert MT is a common practice among students in the online assessment of sight translation. At least 38% of the participants use simultaneous post-editing. This means they immediately correct the machine-translated text that appears on their screens. The teacher-assessor cannot see this, while they deliver their presumably original target texts.

Strategies for covert simultaneous post-editing can include replacing individual lexemes with quasi-synonyms, adding or deleting elements, changing the syntactic function of words or phrases, rearranging sentence fragments, and transforming the structure of the source text. In the case of simultaneous application of several strategies, the students' cognitive mechanisms are often overloaded, which results in the loss of certain

fragments of the source text. Sometimes the loss is as far as the loss of its general meaning.

In order to disguise the use of MT, different fragments of the source text can be translated using different machine translation systems. In addition, reading from the screen can be artificially slowed down, which gives students additional time for simultaneous post-editing. The post-edited machine-translated target text contains other indications of synonymous substitutions and transformations, as well as the slower speed, in the form of pauses made by students while carrying out the necessary mental operations on the relevant text fragments. To make the assessment of online interpreting more objective, it is suggested that it be carried out by analysing the students' recordings instead of immediately after they have finished their sight translation.

Identification of students' simultaneous post-editing in online interpreting involves comparing their target texts with those translated by the machine. This is done using appropriate electronic software to determine the degree of similarity between them. In addition to purely mathematical parameters, additional information can be provided by a comparative analysis of the two target texts. The disadvantage of this approach is its time-consuming nature, which makes its use on a large scale unlikely.

In consideration of the necessity to educate prospective translators and interpreters in the utilisation of ICT in their professional pursuits, whilst concomitantly fostering their creative personalities, it may be auspicious to seek the optimal balance between these two domains within the training curriculum. The psychological complexity of simultaneous post-editing as a type of activity makes it an appropriate subject for further research, which could study its potential as a procedure for developing general interpreting skills.

CHAPTER 7
MONITORING MT DEPENDENCE IN ONLINE TRANSLATOR AND INTERPRETER TRAINING

7.1. Introduction

As evident from the previous section, the problem of unauthorised MT use by student translators complicates the development of their professional competence (see Chernovaty, 2022; Chernovaty, 2024b). Therefore, ways of solving this problem need to be explored. This challenge is recognised not only by teachers, but also by students who are preparing seriously for their future professional activities. Conversely, the unpunished covert use of MT by some students, who then receive high marks in tests undeservedly, negatively affects the motivation of other students in the group, thus creating a vicious circle. In such conditions, it is difficult for students to maintain the proper attitude towards work in class and at home, since they mistakenly consider the significant time gain to be worth the risk of being caught violating the integrity norms.

This problem is particularly significant for online learning. Since its global implementation was limited to a brief quarantine period during the pandemic, researchers did not have the opportunity to conduct extensive studies before it became irrelevant. However, given the ongoing war in Ukraine, this problem remains pressing, making the study of it relevant not only to Ukraine, but also to the rest of the world in view of the inevitable transition to online education in the not-too-distant future.

There are various ways to encourage students to reduce their dependence on MT, one of which is to strengthen control over its use in non-technology-based tasks. This control must be economical; if it requires excessive time, teachers will not apply it. This requirement can only be met through the use of appropriate computer programmes. The programmes must also be effective, i.e. they must objectively and accurately measure the degree of MT use in each case.

To implement the above conditions, it was necessary to analyse the time required for manually comparing students' TTs with similar MTs, study

existing computer programs for comparing texts in terms of their degree of similarity, develop a scale for evaluating students' TTs that takes the degree of MT use into account, test the effectiveness of such a scale in a real online learning process, and formulate appropriate recommendations. This chapter describes how these tasks were carried out.

7.2. Procedure

In most cases, teachers try to determine the extent to which students use MT by manually comparing their TTs with MT TTs. This involves carrying out a word-by-word comparison of the two texts, during which the teacher notes any differences and then subjectively determines the degree of MT use, giving a corresponding grade. However, due to subjective factors, this method is not very reliable and often leads to protests from students and long, exhausting disputes in which both sides remain firm in their opinions.

In an attempt to address this issue, we sought to improve the objectivity of the student translation assessment procedure. In one of our previous studies (Chernovaty & Kovalchuk, 2021a), we attempted to make the process of checking student translations more objective by using a special 10-point scale. In this scale, 10 points means a translation that shows no signs of MT use, while 1 point means a translation that is a complete match for the MT. The scale is divided into four levels (A, B, C and D). When assessing a particular piece of work, if the teacher has no doubt that it is entirely the student's own work, they give a grade of 10. If they hesitate between levels A and B but ultimately decide in favour of level A, they give a grade of 9; however, if they lean towards level B, the grade for this work is 8.

Decisions regarding the other levels (B, C and D) are made similarly. While the outcome is still subjective, the existence of this scale structures the assessor's actions and decisions. Using this scale has proven effective, but the time required for comparative analysis remains problematic. Checking one piece of work can take up to half an hour, which is impractical for teachers who often have to mark dozens of pieces of work for each test.

A solution could be to use computer programmes designed to determine the degree of similarity between two texts, which are used to identify plagiarism, but only if the source of the alleged plagiarism is known. Since in the case of student translations, such sources are limited to a few of the most common

programmes (usually *Google Translate* or *DeepL Translate*), in theory, these text comparison programmes could meet the requirements for the tasks under consideration. Considering that the availability of an appropriate tool is an important factor for large-scale application, we chose a free, publicly available and easy-to-use programme (Compare text, 2023) for our study.

For example, assume that we want to check the degree of MT dependence of a specific student in translating a particular text. First, we have to align the MT's and the student's target texts as it is shown in table 7.1.

Table 7.1: A comparison of the target texts generated by the MT programme *DeepL Translate* and student 1.

Target text translated by MT programme *DeepL Translat*e	Student 1's TT
The constitution and the federal government stand at the top of a governance pyramid that includes city and state jurisdictions. In the American system, each level of government has a significant degree of autonomy with certain powers. Disputes between different jurisdictions are resolved in court. Issues affecting national interests require the simultaneous interaction of all levels of government. The Constitution provides for this. For example, American public schools are primarily subject to local jurisdiction and operate under state regulations.	*The constitution and federal government* ***are*** *stand****ing*** *at the top of the* ***administrative*** *pyramid,* ***which*** *includes* ***jurisdictions at the city and state levels****. In the American system, each level of government has a significant degree of autonomy with* ***specific*** *powers. Disputes between different jurisdictions are resolved* ***through the judicial system****. Issues affecting national interests require simultaneous interaction of all levels of government,* ***and*** *the Constitution provides for this* ***as well****.* ***For example****, American public schools are primarily* ***under*** *local jurisdiction and operate* ***according to*** *state regulations.*

From Table 7.1 it is evident that student 1 did rely on MT (*DeepL Translate*) in his translation. In the student's TT, we can see long chains of words, up to 15 in succession, which completely coincide in the two TTs. We also see most of the covert post-editing techniques discussed in the previous chapter. Specifically, the student used synonymous substitutions:

are standing instead of *stand*, *administrative pyramid* instead of *governance pyramid, which* instead of *that, specific* instead of *certain, under* instead of *that, according to* instead of *under.* There are also some transformations. In particular, the student reformulated two phrases: *city and state jurisdictions* as *jurisdictions at the city and state levels; in court* as *through the judicial system*. In addition, she combined sentences 4 and 5 into one complex sentence, using the coordinative conjunction *and* to connect the clauses, and adding the adverbial phrase *as well* at the end of this new sentence. For the sake of cohesion, she also added an adverbial phrase (*For example*) to introduce the last sentence in this fragment.

However, simply noting that a particular student uses MT when performing tasks where it is not expected is insufficient for managing the learning process. Teachers need to clearly understand the extent of such use, i.e. how much a student depends on the availability or absence of MT. It is also important to compare this level of dependence with that of other students in the group, as well as with the same student at different stages of learning. This will enable conclusions to be drawn about how this dependence is overcome and how technological and purely human translation skills develop more evenly, both for a specific student and for the group as a whole.

This goal can be achieved by using the aforementioned programme regularly, as this allows for the continuous monitoring of translators' professional development.

To utilise this programme, it is necessary to first translate the source text using the MT programmes most commonly employed by students, such as *Google Translate* and *DeepL Translate*. Then proceed to the 'Count words free compare' programme (Compare text, 2025), where a table with two columns will open. Paste the machine-translated text into the left-hand column. Next, copy the translation of the student you want to check into the right-hand column of the table. After that, click on the 'Compare' option located below the table. The screen will display the percentage of verbatim matches between the two texts. In this example, the degree of similarity of the fragments shown in Table 7.1 is 72%.

In addition to showing the percentage of matches, the programme displays the operations performed by the student while working with the source text (i.e. the machine translation). It highlights elements deleted from the text in red and elements added or rearranged by the student in green. This enables the analysis of a particular student's progress (or lack thereof) in

becoming independent from MT at different stages of the module or course, comparison with other students in the group, and justification of their grade in the event of disagreement. If necessary, the programme enables users to take a screenshot of each student's translation analysis results, which can be referenced during individual conversations about the test.

To analyse the work of the next student, click on 'Clear', which will clear the right-hand column where the corresponding translation text is inserted. Then, repeat the procedure described above. Checking one translation takes 1–2 minutes, which is acceptable even when there is a large amount of work.

Of course, the similarity rate of 72% that we identified in Table 7.1 is quite high and warrants certain punitive measures. However, cancelling papers in which a high percentage of similarities with MT has been identified seems impractical. This would force students to rewrite their tests, placing an additional burden on teachers, who would not be happy about this. A more practical approach would be to develop a progressive scale whereby an increase in the percentage of similarities automatically results in a lower grade for the student without requiring them to redo the translation.

When creating such a scale, it is best to start with the existing realities. Similarities in the translation texts are inevitable when the same text is translated by different translators or even MT programmes. The only question is the acceptable proportion of such similarities, which depends on the translation strategy employed — literal or transformational. The greater the proportion of literal translation, the greater the number of coincidences in the target texts produced by different translators. Analysis of translations produced by teachers without the use of MT shows that, depending on the nature of the source text and the translation strategy, the degree of coincidence between their translation texts and MT varies from 30% to 50%.

Since the vast majority of students tend to use the word-for-word translation strategy, let us assume that a 60% match with the MT is the norm for them. Accordingly, any value below this indicator will be considered acceptable and no punitive measures will be taken. However, if the maximum acceptable rate (60%) is exceeded, penalty points will be deducted from the overall score. For example, using a five-point scale, where five is the highest score and one is the lowest, if the match between two texts is in the range of 61-65%, 0.25 points will be deducted from the student's score. Further, the number of penalty points increases progressively in proportion to the increase in the percentage of matches: 66-70% – 0.5 points, 71-75% – 1.0

points, 76-80% – 1.5 points, 81-85% – 2.0 points, 86-90% – 2.5 points. If the value exceeds 90%, the work is cancelled.

These values are subject to change depending on the specific group of students and their tendency to use MT.

The assessment procedure is as follows: First, the degree of similarity of all students' translations to the MT is checked, and this is recorded as a percentage. Then, the translations are checked independently of the aforementioned similarity and a grade is assigned. If the similarity percentage of a particular translation does not exceed 60%, the grade remains unchanged. If this value is exceeded, the corresponding number of points is deducted from the grade. For example, if a student's translation receives a grade of 4.8 points, but the degree of similarity with the MT is 86%, then 2.5 points are deducted from the initial grade, giving a final grade of 2.3 points.

We hypothesised that regular use of the scale could encourage students to become more independent translators, thus reducing their reliance on MT over time. To test this hypothesis, we conducted an experimental study. The participants were 26 third-year undergraduate students (one male and 25 females) specialising in English Language and Literature at V. N. Karazin Kharkiv National University. They were aged between 19 and 20. The study formed part of a 16-week course on social and political translation (US government), comprising 32 contact hours and 64 hours of independent study. For their homework assignments, students completed written translations and submitted them to their Google Classroom. These assignments were checked according to the above-described methodology, and the results were communicated to the students. As part of the course, the students completed two tests: an intermediate test (Test 1) and a final test (Test 2). These tests were assessed using the same criteria. The results of the analysis of the students' work are presented below.

7.3. Results and Discussion

The testing of this hypothesis involved a comparative analysis of the dynamics of changes in the proportion of MT features in the TTs of the aforementioned students during the writing of the intermediate (T-1) and final (T-2) tests. The results of this analysis are presented in Table 7.2.

Table 7.2: Comparative proportion (in percentage) of MT features in the intermediate (T-1) and final (T-2) tests. Symbols: GR – group, T – test, *m* – mean value, (1–2) – difference between the indicators in the first and second tests.

GR	T	Participants													*m*	(1–2)
		1	2	3	4	5	6	7	8	9	10	11	12	13		
1	1	72	72	76	68	86	76	71	52	72	74	89	76	77	74	– 14
	2	48	52	60	59	67	47	42	55	33	59	69	63	61	60	
2	1	77	78	72	65	59	77	81	76	73	71	56	73	85	73	– 17
	2	33	62	52	58	55	42	64	33	53	49	57	55	63	56	

As can be seen in Table 7.2, a more significant decline of 17% is evident in Group 2, particularly among participants P1 and P8, who experienced reductions of 44% and 43%, respectively, dropping from 77% to 33% and 76% to 33%. The remaining participants exhibited a less substantial yet still significant decline, with reductions of 35% (P6), 22% (P10 and P13), 20% (P3 and P9), 18% (P12), 17% (P4 and P7) and 16% (P2). Other participants demonstrated more modest results: P5's decline was only 4%, while P11's result was 1% worse than in Test 1.

However, to ensure objectivity, the results of Test 1 should also be considered. For example, although P5's performance in Test 2 decreased by only 4%, her level of MT-independence was already sufficiently high (59%) in Test 1. Similarly, although P11's results in Test 2 were formally worse by 1%, her MT-freedom index was already high enough in Test 1 (56%) and remained practically the same (57%) in Test 2. Consequently, it can be concluded that these participants were sufficiently MT-independent in their translations in both instances. Conversely, despite notable declines of 22%, 17% and 16% in the scores of P7, P13 and P2 respectively, their results remained above the minimum acceptable level of MT dependence (64%, 63% and 62%). This suggests that they continue to utilise MT, albeit to a lesser extent.

The largest decrease in MT use in Group 1 occurred in P9 (from 72% to 33%), as well as in P6 and P7 (from 76% to 47% and 71% to 42%, respectively), and in P1 (from 72% to 48%), with corresponding declines of 39%, 29% and 24%. Moderate declines were observed in P2 and P11 (from 72% to 52% and from 89% to 69%, accordingly) and in P5 (from

86% to 67%), P3 and P13 (from 76% to 60% and from 77% to 61%, respectively), P10 (from 74% to 59%) and P12 (from 76% to 63%), equating to reductions of 20%, 19%, 16%, 15% and 13%, in that order. The decline in MT dependence in P4 (9%, from 68% to 59%) was less significant than in P8, which showed a 3% decrease (from 52% to 55%). As in group 2, we must consider the initial reference point, i.e. the participants' results in Test 1, as well as the difference between Tests 1 and 2. Despite the significant reduction in the MT-dependence index for participants 5 and 11 (19% and 20%, correspondingly) their performance remains above the maximum acceptable level (67% and 69%, respectively). Participants 12 and 13 also performed slightly above this level, achieving 63% and 61%, in that order..

Thus, the research hypothesis was completely confirmed. The regular use of a special programme (Compare Text 2025) to control the proportion of machine translation (MT) in the participants' target texts and the progressive scale of penalty points developed by our research team contributed to a decrease in the participants' MT dependence at the end of the semester. In Test 1, the mean proportion of MT features in the participants' TTs was over 70% (74% in Group 1 and 73% in Group 2). This indicates that almost all participants in both groups (with the exception of P8 in Group 1 and P5 and P11 in Group 2) used MT for home assignments and assessment tasks.

By contrast, in Test 2, this figure decreased by 14% in Group 1, reaching an average of 60%. In Group 2, it decreased by an even greater amount – 17% – to reach an average of 56%. Only three participants in each group remained above the maximum acceptable level of 60%: participants 11, 12 and 13 in group 1 (69%, 63% and 69%, respectively), and participants 2, 7 and 13 in group 2 (62%, 64% and 63%, respectively). However, this excess is insignificant.

7.4. Conclusions

The study confirmed the widespread use of machine translation by students when carrying out written translation tasks for which the use of such tools is not permitted. Evidence of this was found in 88% of students' work during the first test assignment, with an average of over 70% of matches between this work and machine translation. This suggests that students

depend heavily on access to machine translation programmes in specific situations.

Based on these results, it was assumed that the aforementioned dependence could be reduced by establishing an effective, regular monitoring system for the content of students' independent work and their completion of control tasks. The problem of spending a significant amount of time identifying machine translation elements and calculating their percentage in students' work was solved using a computer programme designed for this purpose (Compare Text, 2025). Another issue, namely how to encourage students to reduce their use of machine translation when completing relevant tasks, was addressed by developing a progressive scale that considers the extent to which a student relies on machine translation when evaluating their performance on a specific translation task.

Using the aforementioned computer programme alongside a progressive scale over one semester reduced students' dependence on MT programmes, enabling them to perform translation tasks independently without the use of technological aids. Thus, a potential method of reducing students' reliance on technological tools when performing professional activities has been identified. The search for other solutions is discussed in the subsequent chapters of this monograph.

CHAPTER 8
POST-EDITING AND STUDENTS' THINKING AND ANALYTICAL ACTIVITY

8.1. Introduction

As described in the previous section, the establishment of regular and effective monitoring of students' ability to perform various types of translation cannot in itself ensure the development of translation competence, regardless of access to machine translation or other translation technology. This is due to various factors, including students' use of hidden post-editing techniques, which was discussed in Section 7. As previously mentioned, the development of such competence ultimately depends on the amount of translation completed independently (i.e. without the use of technology) and the extent to which students are actively engaged in the process. Both of these parameters are significantly impaired by hidden simultaneous post-editing. However, open post-editing of machine translation (MT) text (MT TT) may be a promising way to ensure both the aforementioned volume and the necessary level of student activity. The study of the process and content of post-editing MT-TT is a popular area of research.

For example, the skillset required for effective post-editing has been examined by some scholars, such as Almaaytah (2022), who also looked into the feasibility of incorporating such training into university translation programmes. In the meantime, other scientists have concentrated on the way MTPE affects the standard of the output. One of them (Yang et al., 2023) reported no notable difference in quality between MTPE and human translation, though slightly superior MTPE-produced texts were found. In the context of news translation, however, MTPE exhibited superior performance in comparison to human translation.

Another study conducted by Liang et al. (2024) explored the NMT application in film industry. The focus of the study was on using Google NMT to translate subtitles. The investigation established that one in four captions contained mistakes and suggested a structure to improve the standard of NMT subtitling capacity.

Some researchers have examined the readability of source texts (ST) in relation to the standard of MTPE outputs in English-Chinese neural machine translation (NMT). Dai and Liu's (2024) findings indicate that contemporary readability metrics tend to demonstrate superior performance in comparison to conventional automatic effort estimation instruments in addressing industrial requirements.

In order to confront the challenge of expeditiously translating substantial quantities of domain-specific content with precision, Lagarda et al. (2015) investigated the potential of an automatic MTPE system. This system made use of web-based learning to adjust in real time, in accordance with user amendments, and was successful when specific internal text circumstances were met.

Although the MTPE is frequently categorised into light and full versions, this distinction, as Pérez (2023) has observed, can prove opaque, given that translators may find it challenging to differentiate between essential amendments and stylistic predilections. The said author has recommended redefining MTPE levels within a specially developed framework, given the substantial improvements in output quality from modern NMT systems.

A recent study investigated the effects of MTPE on students' creativity. This is something that experts have been debating for a long time (Guerberof-Arenas et al., 2024). The study found no proof that MTPE has a direct influence on creativity. Even so, learners showed a greater tendency to make inventive alterations and displayed elevated assurance in dealing with MT-associated issues. Significantly fewer errors were made during MTPE, and students also demonstrated improved creativity in human translation tasks.

In the teaching of translation, the research looked at the change in the industry where computer translation tools are being used more frequently to replace human translators. Latorraca's (2023) study delved into the perceptions of translation students regarding MTPE and their confidence in undertaking such tasks. It was indicated that MTPE tasks were not being assessed, performed, or reflected on effectively by the students. The study's emphasis on the need for more specialised training programs in translation education was a key finding.

In the context of online education, where students tend to over-rely on machine translation tools, the issue of incorporating MTPE into translator training is particularly significant. This excessive reliance can impede the

cultivation of fundamental human translation competencies, which are intimately associated with the extent and quality of translation practice undertaken by each learner. As was mentioned before, translation problems arise and reoccur across different texts. It is through the brain's complex thinking processes, like problem-solving and decision-making, that it slowly creates the brain connections needed to deal with such challenges. The development of these neural networks is enhanced by increased translation experience, thereby improving the learner's translation proficiency.

As mentioned above, the covert use of MT by students (see Chapter 7) means that online learning may not provide sufficient independent translation practice or intellectual stimulation. In this section, based on our analysis of experimental teaching, we will consider how to improve these aspects by incorporating MTPE procedures into the learning process.

8.2. Methodology

8.2.1. The hypothesis

Our research was guided by the following hypothesis: In the context of online translation instruction, combining regular machine translation post-editing (MTPE) with the think-aloud protocol (TAP) enhances students' analytical and cognitive engagement during independent tasks. This heightened engagement, in turn, supports the development of their ability to translate specialised texts effectively. We anticipate that this approach will reduce students' reliance on machine-translated target texts while improving the quality of their independent translations in terms of accuracy, translation speed, subject matter comprehension and the ability to address terminological challenges critically.

8.2.2. The course

To evaluate our hypothesis, we conducted an experimental study as part of a semester-long elective course entitled *Translating English-Language Discourse in Psychology*. Spanning 120 academic hours, the course included 28 hours of direct instruction and 92 hours of independent study. It introduced

foundational psychological concepts through thematically relevant original texts. The course was delivered entirely online. Students attended a weekly 80-minute virtual class, during which the instructor presented new material and facilitated sight translation using on-screen texts. Following each session, students completed a homework assignment in the same style and submitted it via *Google Classroom* prior to the next class.

8.2.3. The participants

The participants were 22 first-year MA students specialising in English Language and Literature at the School of Foreign Languages at V. N. Karazin Kharkiv National University in Ukraine. At the start of the experiment, their expected level of English proficiency according to the CEFR classification (CEFR, 2018) ranged from C1 to C2, and they had had over 200 contact hours of specialised translation.

8.2.4. The procedure

8.2.4.1. Procedure for completing homework assignments

As previously mentioned, banning MT from students' homework is counterproductive. In our case, not only was the MT application permitted, it was compulsory. Throughout the course, students were given weekly assignments involving English texts. They had to translate these texts into Ukrainian using *Google Translate*, and then post-edit the MT translation, explaining the reason for every correction. To this end, we employed a modified *Think-Aloud Protocol* (TAP) procedure (Kussmaul & Tirkkonen-Condit, 1995) to encourage analytical and thinking activity intensity during home tasks and prevent mere synonymous substitutions (see Chapter 7). The procedure is illustrated below (see Table 8.1) using a fragment from a text (Shreve, 2006b) that was used in one of the tasks. In column 2, the figures show the errors in the MT translation, while the post-edited fragments are highlighted in italics in column 3.

Table 8.1. Example of the procedure for completing homework assignments

ST	MT TT	Post-edited TT
The deliberate practice: translation and expertise. The field of expertise studies in cognitive psychology proposes that expert performance in cognitive skill domains such as chess, computer programming, or systems analysis is enabled by distinctive cognitive resources.	**Навмисна (1) практика: переклад та експертиза (2).** Дослідження в галузі когнітивної психології припускають, що ефективність експертів (3) у таких сферах когнітивних навичок (4), як шахи, комп'ютерне програмування або системний аналіз, забезпечується особливими (5) когнітивними ресурсами.	**Цілеспрямована практика: переклад та досягнення фахового рівня.** *Результати* досліджень когнітивних психологів у галузі *фахових знань та умінь дозволяють* припустити, що *фахова діяльність* у сферах, які *вимагають* когнітивних *умінь*, таких як гра в шахи, комп'ютерне програмування або системний аналіз, забезпечується *певними* когнітивними ресурсами

The students' explanations for the post-editing of this fragment could be as follows (the numbers refer to the hypothetical student's corrections:

(1) *deliberate practice* is translated as навмисна (instead of *цілеспрямована*) *практика* (failure to take into account the stages of development of expert knowledge, the last but one of which is *deliberate practice*), translated as the commonly used word навмисна, which causes confusion. In two other cases, this collocation was translated correctly. Conclusion: the programme does not consider the context when choosing different meanings of the same word in the source language, nor does it consider the consistency of terminology use;

(2) *expertise* is translated as *експертиза* instead of *досягнення фахового рівня* (unjustified transcoding of the term that has a different meaning in Ukrainian: *expertise* – research of an issue in order to draw the right conclusion; failure to consider the stages of a specialist's development, the last of which is professional level). See also the translation of *expertise studies* in sentence 1. Conclusion: the programme does not consider the relevant theory because of the lack of subject knowledge;

(3) *expert performance* is translated as *ефективність експертів* (instead of *фахова діяльність*), which indicates that the programme does not understand the connection between this phrase and the levels of professional knowledge and that the term *експерт* has been transcoded without justification (see comment on error 2). Conclusion: the programme tends to translate word for word without taking the context into account.

(4) *skill* is translated as *навичка* (instead of *уміння*), which is required by the context (in Ukrainian, the term *навичка* refers only to an action that can be automated), changing the meaning of the ST term. Conclusion: the programme does not take context into account when choosing different meanings of the same word in the source language.

(5) The first word of the phrase *distinctive cognitive resources* is translated with the common word *особливими* (instead of *певними*), which causes confusion, since there is nothing special about these resources. Conclusion: the programme does not take context into account when choosing different meanings of the same word in the source language.

8.2.4.2. Procedure for homework assignment assessment

The students' weekly homework assignments, submitted via Google Classroom, were evaluated using several indicators. To determine the level of post-editing effort, which was presumed to have a positive impact on the overall translation efficiency, we assessed each student's work based on specific criteria. Based on this analysis, each assignment was categorised into one of four levels (A–D).

A: Fully independent post-editing with numerous well-justified corrections.

B: mostly independent post-editing with a moderate number of corrections and occasional lack of justification;

C: mainly superficial post-editing with a few corrections and limited explanations;

D: entirely superficial post-editing with minimal corrections, no justification and missed obvious machine translation errors.

To refine the classification of these assignments, we introduced a 10-point scale, assigning a numerical value to each level and its transitional stages: A – 10, A/B – 9, B/A – 8, B – 7, B/C – 6, C/B – 5, C – 4, C/D – 3, D/C – 2, D – 1.

If evaluators agreed that a submission fell squarely within level B, it received a score of 7; if they debated between B and C and leaned towards B, the score was 6; if they chose C, the score was 5; and clear classification as C warranted a score of 4. The same grading logic applied to all other levels and their combinations.

To examine the potential impact of students' analytical engagement during homework on their attitudes toward post-editing and anticipated translation quality, we administered two interim tests (in the fourth and seventh class sessions) and a final test (in the last session). Although the use of machine translation (MT) was formally prohibited under penalty of disqualification, no technical controls ensured compliance; therefore, students' translations (TTs) were assessed by comparison with MT outputs. In each test, participants translated English texts into Ukrainian on topics covered in the preceding course segment.

8.3. Results and Discussion

8.3.1. Analytical and thinking activity intensity

The results of the analysis of the participants' analytical and thinking activity intensity and their MT-dependence in home assignments and tests are shown in tables 8.2 and 8.3.

Table 8.2. Dynamics of the participants' analytical activity in home assignments by groups: AII – average intensity index, P – participant, C-1 – cycle 1 (home assignments 1-3), C-2 – cycle 2 (home assignments 4-6), C-3 – cycle 3 (home assignments 7-11), *m* – mean value.

Group A (AII – 9,5)				Group B (AII – 6,8)				Group C (AII – 1,4)			
P	C-1	C-2	C-3	**P**	C-1	C-2	C-3	**P**	C-1	C-2	C-3
1	9	10	10	**2**	-	4	8	**3**	-	1	1
4	10	10	10	**5**	7	7	7	**6**	2	-	-
8	10	10	8	**14**	9	6	10	**11**	1	3	-
9	10	9	10	**16**	5	8	8	**13**	2	1	-
12	10	7	10	**22**	8	8	7	**18**	-	-	6
15	9	10	10					**19**	3	1	3
17	9	9	10					**20**	5	-	-
21	10	10	10								
23	8	10	10								
M	**9.4**	**9.4**	**9.8**		**5.8**	**6.6**	**8.0**		**1.9**	**0.9**	**1.4**

Table 8.3. Dynamics of the participants' analytical activity in tests by groups: MTDI – MT-dependence index, P – participant, T1 – test 1, T2 – test 2, T3 – test 3, *m* – mean value.

Group A (MTDI – 8,6)				Group B (MTDI – 7,0)				Group C (MTDI – 5,3)			
P	T-1	T-2	T-3	**P**	T-1	T-2	T-3	**P**	T-1	T-2	T-3
1	9	10	9	**2**	-	3	6	**3**	-	2	2
4	10	8	8	**5**	7	6	8	**6**	1	-	2
8	6	7	7	**14**	3	7	7	**11**	1	4	7
9	8	10	9	**16**	2	7	7	**13**	1	4	4
12	10	-	10	**22**	4	7	7	**18**	2	7	7
15	4	8	7					**19**	2	3	7
17	9	8	8					**20**	3	-	8
21	8	10	10								
23	6	9	9								
m	**7.8**	**8.9**	**8.6**		**4.0**	**6.0**	**7.0**		**1.7**	**4.0**	**5.3**

As shown in Table 8.2, students in group A demonstrated the highest intensity of analytical activity during homework assignments (9.5 points out of 10), with all members submitting all planned assignments and 95% of these being completed independently. Slight deviations from the maximum possible parameters of independence from MT were observed in participants P15 and P17 (90% in the first cycle), P9 and P17 (90% in the second cycle), P8 (80% in the second cycle) and P12 (70% in the second cycle). Almost all participants in this group showed improvement in their independence when completing homework assignments. In the third cycle, all participants achieved the maximum result, except for participant 8, who displayed an impressive degree of independence at 80%.

Conversely, as illustrated in Table 8.3, students in this group also exhibited reduced confidence in their abilities when taking Test 1, with an average degree of independence from MT of 78%. This is probably due to the higher level of stress experienced during the test. While this average is quite high, some participants were significantly dependent on MT systems, using them to complete Test 1 to degrees of 40% (P8 and P23) and 60% (P5). The remaining participants were more than 80% independent from MT, and two participants (P4 and P12) were completely independent.

This suggests that students require a certain amount of time and a certain number of completed tasks to develop the confidence to produce high-quality translations independently. This assumption is confirmed by an analysis of the dynamics of independence from MT in the control tasks. During Test 2, the average independence score for students in this group increased to 89%, exceeding 80% for all participants except P8 (70%).

The stress level during test 3 (semester exam) was naturally higher than during tests 1 and 2 (midterm tests), and this had a certain impact on the students' performance. The average scores in the group decreased slightly but remained at a sufficiently high level (86%). Only two students failed to achieve a level of 75% independence from MT (participants 8 and 15 – 70% each, which is still a sufficiently high level).

The aforementioned trends in independence from MT are clearly visible in the analysis of students' results in group B, whose average analytical activity intensity during homework assignments was 68%. This grew steadily from 58% in cycle 1 to 66% in cycle 2 and 80% in cycle 3 (see Table 8.2). This growth (or maintenance of a fairly high level) was also evident among individual participants in this group: P2: 40% in cycle 2 and 80% in cycle 3; P14: 60% in cycle 2 and 100% in cycle 3; P16: 50% in cycle 1 and 80% in cycles 2 and 3. P5 and P22 achieved 70–80% in all cycles.

As in the case of students in group A, when completing test tasks, students in group B showed (see Table 8.3) an increase in their level of dependence on MT compared to the situation with homework assignments. As in group A, this level gradually decreased as students gained experience in post-editing MT and became more confident in their abilities. Thus, in test 1, the average level of independence from MT in this group was only 40%, which increased to 60% in test 2 and to 70% in test 3. This increase is characteristic of all group members: P2 – from 30% to 70%, P5 – from 70% to 80%, P14 – from 30% to 70%, P16 – from 20% to 70%, P22 – from 40% to 70%. Thus, the degree of independence from MT in this group in the tests is 10% lower than when performing independent tasks, but, as noted earlier, this may be due to higher stress levels in situations of formal control.

Finally, the results for group C students confirm the general trend. Unlike the other two groups, these students were characterised by low levels of activity when preparing their homework assignments. Firstly, they submitted only 42 out of the expected 77 assignments, which is half (54%) the expected amount. Even when completing the remaining 46%, their level of intellectual activity

was low as they used MT with minimal post-editing to complete them. In cycle 1, two participants (P3 and P18) did not submit any homework, and the average level of dependence on MT was 81%. Individual levels ranged from 10% (P11) and 20% (P6 and P13) to 30% (P19) and 50% (P20). In the second cycle, this level increased to 91%, improving slightly to 86% in the third cycle and remaining at a very low level. Individual indicators ranged from 90% (P3 in cycles 2 and 3; P13 and P19 in cycle 2); 70% (P11 in cycle 2; P19 in cycle 3); and 60% (P18 in cycle 3). Additionally, some participants did not submit any individual assignments: P3 did not submit three assignments in cycle 1; P6 failed to submit eight assignments in cycles 2 and 3; P11, P13 and P20 skipped five assignments in cycle 3; P18 omitted six assignments in cycles 1 and 2; and P20 did not submit three assignments in cycle 2.

Thus, the level of intellectual activity of this group when performing independent work was extremely low. This was confirmed during the completion of test 1, where the degree of dependence on MT was 83%. However, since the test tasks, unlike homework assignments, were graded and affected the overall grade, after receiving unsatisfactory grades on test 1, students in group C took this into account in tests 2 and 3, as a result of which this level in their work improved to 60% and 47%, respectively.

8.3.2. The impact of analytical and thinking activity intensity on the development of translation competence

8.3.2.1. General

In order to determine the impact of intellectual activity during the translation process on students' professional development, we analysed and compared the translation results of students from all three groups during the final test. Participants were given 90 minutes to translate the 547-word source text (ST) online. This text was adapted from the original research article by Watrous and Ekstrom (2014) and related to the psychological and neural conceptions of memory. The aim of the test was to assess participants' translation accuracy and speed, as well as their dependence on machine translation (MT). Accuracy was assessed by considering the number of information errors (i.e. errors relating to the distortion of the source text (ST) meaning), with a particular focus on errors caused by a lack of appropriate subject knowledge or domain-specific terminology.

It was assumed that engaging in high-level analytical intellectual activity when translating and analysing texts independently would lead to more effective assimilation of subject knowledge in psychology and the development of a critical approach to selecting appropriate terminology to denote such knowledge. Having such knowledge and a critical approach when selecting appropriate terminology would reduce the number of problems when translating the aforementioned ST, thus speeding up the translation process.

Conversely, a low level of analytical intellectual activity during the translation and analysis of texts in independent work will result in less effective assimilation of subject knowledge. This will prevent the development of a critical approach to selecting appropriate terminology, meaning that such selection will be based on random factors and will not take the broader context into account. A lack of subject knowledge and critical thinking when choosing terminology will lead to more problems during ST translation and slow down the translation process.

During the final test, participants were prohibited from using MT; however, there were no technical means to prevent them from doing so. Consequently, all of the students' work was checked for consistency with the MT TT. The results of the participants' final test are shown in Table 8.4.

Table 8.4. Characteristics of the participants' translation in the final test by groups: AII – average intensity index, P – participant, length – length of TT (in percentage as compared to the ST), MT – percentage of coincidence of the subjects' TTs with the MT TT, errors – information errors, *m* – mean value.

Group A (AII – 9,5)				Group B (AII – 6,8)				Group C (AII – 1,4)			
P	length	errors	MT	**P**	length	errors	MT	**P**	length	errors	MT
1	100	0	37	**2**	100	7	35	**3**	100	36	58
4	100	8	39	**5**	85	6	38	**6**	61	11	43
8	67	7	46	**7**	100	3	38	**11**	100	16	42
9	64	2	39	**14**	45	7	33	**13**	54	27	45
12	100	6	21	**16**	100	12	43	**18**	85	11	47
15	100	6	40	**22**	100	10	42	**19**	74	22	37
17	100	3	37					**20**	100	14	30
21	100	5	34								
23	100	7	35								
m	**92**	**4.9**	**36**		**88**	**7.5**	**38**		**82**	**19.6**	**43**

The data presented in Table 8.4 enable us to assess the impact of the intensity of analytical and thinking activities on the development of students' translation competence in the post-editing process.

8.3.2.2. Accuracy of translation

Comparing changes in the ratio of information errors across the groups indicates a potential causal relationship between the extent to which students engage in MTPE of TTs during independent work and the quality of their translations. In Group A, the average number of information errors was 4.9, ranging from 0 to 8. In Group B, where the intensity of MTPE was moderate, the average increased to 7.5 errors per participant (an increase of 50%), with a similar range of 10 errors (from three for participant 2 to 12 for participant 16). The most striking results were observed in Group C, where the intensity of MTPE was lowest. This group had an average of 19.6 errors, which was 2.6 times higher than Group B and 4 times higher than Group A, and had the widest error range at 25 points (from 11 errors for participants P6 and P18 to 36 errors for participant P3).

8.3.2.3. Speed of translation

As shown in Table 8.4, of the nine participants in Group A, only two (22%) failed to translate the entire ST. P8 (67%) and P9 (64%) translated approximately two-thirds of it. On average, Group A translated 92% of the ST. The average completion rate in Group B was slightly lower at 88%. Two of the six students (33%) did not finish: one translated 45% of the ST, while the other reached 85%. In Group C, the average drops further still, to 82%. Only three participants (43%) translated the entire ST. The lowest scores were achieved by P13 (54%), P6 (61%), P19 (74%) and P18 (85%). These results suggest that the amount of independent post-editing work in homework assignments is directly linked to translation speed. The more intensive the independent work, the higher the completion rate: 82% in Group C (with the lowest level of analytical activity), 88% in Group B, and 92% in Group A. The same trend is evident in the proportion of students who completed the ST in full: 29% in Group C, 67% in Group B, and 78% in Group A. The quantitative findings align with the qualitative assessment of the data.

8.3.2.4. Subject knowledge

Group A's information errors are not usually caused by a lack of subject knowledge or a poor understanding of the ST's content. Instead, they result from the selection of an unsuitable Ukrainian lexeme, which is not in accordance with the rules of Ukrainian linguistics. Frequently, the selected word does not constitute an exact congruence with the source term, but rather exhibits a tenuous semantic affinity with it. Examples of this include: *memory devices – прилади* (instead of *механізми*) *пам›яті* and *watching of actions – споглядання дій* (instead of *стеження за діями*), *specific stimuli – особливі* (instead of *конкретні*) *стимули*. Group A is also impacted by inaccuracies connected to an absence of subject knowledge (e.g., *propositional information – отримана* (instead of *пропозиційна*) *інформація*), however these inaccuracies are not substantial in number.

The aforesaid tendencies are also characteristic of the Group B participants, whose autonomous tasks are distinguished by a middling (though presumably barely adequate) degree of MTPE. This is demonstrated by a comparatively slight rise in the overall quantity of information errors in the TTs of learners in this group. Increases in this area do, however, naturally result in a corresponding rise in the number of information errors, for example, *declarative memories – визначні* (instead of *декларативні*) спогади; *encoding – шифрування* (instead of *кодування*).

There was a sharp increase in information errors in Group C (rising from 2.6 to 4 times more errors than in Groups B and A). The students' MTPE was significantly lower here, so it is likely this is what caused the rise. They did not process information thoroughly enough during MTPE, which meant they could not acquire the necessary subject knowledge. As a result, students may have had an incomplete understanding of the subject matter in ST and the terms used in TT, and were reliant on MT for answers, which may not have been suitable. Despite knowing about this, students often turn to MT, whose solutions are not always acceptable, and they may not make the necessary substitutions to convey the meaning of ST fully.

The TTs of Group C students frequently deviated from the content and norms above. This can largely be explained by the adoption of lexical items in MT without critical analysis. For example, *states of mind – стани розуму* (instead of *свідомості*); *face-processing system – система обробки* (instead of *розпізнавання*) *обличчя*.

A large number of the translation options selected by the subjects in Group C suggest that the learners in this group do not have the necessary subject and terminology knowledge that could have been obtained in the MTPE process if it had been supported by a suitable degree of analytical and cognitive activity. This meant that students in this group frequently selected lexemes that, by their very nature, could not be combined with other terms or that were completely meaningless. Here are some examples of this: *multiple memory – багатозадачна* (instead of *множинна*) *система пам'яті*, *front-end modules – спеціальні модулі* (instead of *модулі первинної обробки*).

Participants in Group C experienced constant entropy, as well as a lack of relevant terminology. This sometimes led them to invent nonsensical or use completely inappropriate terms: *frontal lobe – лобова мочка* (instead of *лобні ділянки*), *device in the mind – прилад* (instead of *механізм*) *у свідомості.*

8.3.2.5. MT dependence

In terms of the independence of the subjects' TTs (i.e. how different they are from the MT version of the ST), the results of all three groups are within acceptable limits. Although the percentage of agreement between the students' TTs and the MT TTs increases from group to group (36% in group A, 38% in group B and 43% in group C, as shown in Table 8.4), this may be accidental.

Nevertheless, a more thorough investigation of the students' TTs across the various groups indicates that the discrepancy between them is more pronounced than the results of the formal comparison would imply. It is shown by the analysis that certain strategies are used by the subjects (especially Group C) to facilitate the covert use of MT. Consequently, the software does not regard the relevant part of the student's TT as an indication of the MT usage.

One way in which such a strategy may manifest itself is through the rearrangement of sentence fragments from the MT TT in the student's TT without making significant changes to the former. This results in a loss of formal similarity between the student's TT and the MT TT, to the extent that even plagiarism detection software may fail to recognise the similarities between the two texts. Of course, when rearranging the fragments of an imperfect sentence generated by MT, semantic inconsistencies may occur, including the use of antonymous expressions and the preservation of identical fragments in different parts of the student's sentence. This is due to a poor understanding of their meaning and insufficient correlation with the meaning of the ST.

There are significant differences between the TTs of different groups of subjects in terms of their correlation with the MT TT. Let us illustrate this with the example of rendering just two sentences from the ST: The translation of these sentences by the participants 1 (Group A), 2 (Group B) and 3 (Group C) are presented in table 8.5 below.

Various psychological taxonomies of the multiple types of memory exist. All of these divide memory with respect to both capacity and persistence, with short-term or 'working-memory' systems having limited capacity and persistence but high-fidelity, serving as a central workspace for bringing together and transforming information from other memory systems, closely linked to attention.

Table 8.5: A comparison of the target texts generated by the MT programme *Google Translate* and participants 1 (Group A), 2 (Group B) and 3 (Group C). The matches with MT TT are shown in bold; SS – synonymous substitution, WT – word transposition, WD – word deletion, WA – word addition.

MT	*Існують різні психологічні таксономії багатьох типів пам'яті. Всі вони ділять пам'ять як на ємність, так і на постійність, при цьому короткострокові системи або системи «робочої пам'яті»' мають обмежену ємність і стійкість, але мають високу точність, слугуючи центральним робочим простором для збору та перетворення інформації з інших систем пам'яті, тісно пов'язана з увагою.*
P1 (A) 35%	*Наявні* ***різні психологічні*** *класифікації* ***багатьох типів пам'яті. Всі вони*** *розділяють* ***пам'ять*** *на різні її види, зважаючи на здатність та* ***постійність****, тобто, короткотривала* ***пам'ять****, або «оперативна* ***пам'ять****» – це система з обмеженими можливостями та постійністю, але* ***має високу точність****, слугуючи* ***центральним*** *«процесором», який збирає воєдино та трансформує* ***інформацію*** *з іншої системи пам'яті, пов'язаної з* ***увагою***
P2 (B) 26%	***Існує*** *велика кількість* ***психологічної*** *систематики численних видів* ***пам'яті****. Усе це* (SS) *поділяє* (SS) ***пам'ять*** *згідно* ***як*** (WT) *об'єму* (SS) ***так і*** *стійкості* (SS)*, з* ***системами короткострокової*** *або «оперативної* (SS) ***пам'яті»*** (WT)*, що* ***обмежили*** *об'єм* ***та стійкість*** (WT)*,* ***але*** (WD) ***висока точність*** *відтворення* (WA)*, що* (WT) ***служить*** (WD) ***робочим простором для*** *об'єднання* (SS) ***та*** *трансформації* (SS) ***інформації з інших систем пам'яті, тісно пов'язаних з увагою.***

P3 (C) 45%	***Існують різні психологічні таксономії*** *декількох* (SS) ***типів пам'яті. Всі вони*** *розділяють (SS)* ***пам'ять*** *щодо* (SS) ***ємності, так і*** *наполегливості* (SS)*, з* ***короткостроковими*** (WT) *або «робочими» системами* (WT)*, що* ***мають обмежену*** *вмістимість* (SS) ***і*** *наполегливість* (SS)*,* ***але високу точність,*** *що служить* (WT) ***центральним робочим простором для*** *об›єднання* (SS) *і* (SS) ***перетворення інформації з інших систем пам'яті, тісно пов'язаних з увагою.***

As can be seen in Table 8.5, the content of ST is accurately rendered in the translation of P1 (Group A) via a transparent syntactic structure. However, the proportion of literal matches with the MT TT is relatively small at 35%, with no more than three consecutive words, which mainly concern clichés (*має високу точність*) and terminology (*пам'ять* – four times*, центральним, інформацію* and *увагою*).

An analysis of the P2 translation (Group B) suggests hidden post-editing of the MT TT, as the participant generally adheres to the ST structure, even when applying transformations. This is evidenced by an unsuccessful attempt to preserve the MT TT construction, *як… так..,* as well as literal coincidences with the MT TT of nine consecutive words at the end of the fragment, while rearranging words. Having skipped the first cycle entirely (no downloaded work), P2 reached an intensity level of 80% in cycle 3 and has accumulated sufficient post-editing experience, which she is attempting to apply in this case. However, the high concentration of transformations — seven synonymous substitutions (SS), four word transpositions (WT), two word deletions (WD) and one word addition (WA) — reduced the degree of agreement with the MT TT to 26% and complicated the syntactic structure to such an extent that it jeopardised the conveying of the ST's meaning.

Attempts at hidden post-editing of MT TT can also be seen in the P3 translation (Group C). However, limited experience of applying it (with no downloaded work in the first cycle and an intensity of 10% in cycles 2 and 3) resulted in a higher number of verbatim matches with the MT TT (two fragments of four words and one of ten words in a row) and the use of rather primitive tools (eight SS and two WT). While these changes did contribute to reducing the degree of matches with the MT TT to an acceptable 45%, a poor understanding of the ST and MT TT content due to a lack of subject knowledge and terminology meant that the latter could not be post-edited and the meaning of the ST was completely lost in the TT.

8.3.2.6. Critical approach to terminological problems

We analysed the participants' performance in translating the ST related to the cognitive model of the mind in Test 1 to establish this hypothetical impact of post-editing on the development of the translator's critical approach to terminological problems. The text comprised 31 terms whose use were controlled in the analysis.

The scrutiny of the MT TT (Google Translate) revealed that the system committed 23 errors in translating the aforementioned 31 terms, signifying that its terminological precision stood at a mere 26%. In the event of the validity of our hypothesis, we may anticipate a preponderance of literal coincidences with the MT TT among the participants exhibiting the least cognitive and analytical activity in their homework (group C). Conversely, the proportion of such coincidences in group A is expected to be minimal, with the results of group B participants falling somewhere in between these two extremes. Conversely, the effectiveness of specialised terminology acquisition and the precision of its utilisation in independent translation should be directly proportional to the aforementioned intensity, i.e. it should be greatest in group A and least – in group C. The results of the analysis are presented in table 8.5.

Table 8.5. Terminological accuracy and the share of coincidences with the MT variants in the test. HWI – degree of homework independence (out of 10); TI – degree of test independence (out of 10); MT (a) – MT acceptable variants; MT (u) – MT unacceptable variants.

Group	HWI	TI	Average accuracy (%)			Average share of coincidences with MT (%)		
			general	MT (a)	MT (u)	general	MT (a)	MT (u)
A	9.6	7.5	70.7	87.9	63.0	21.2	31.5	15.5
B	7.0	4.8	50.8	77.3	46.6	33.6	36.4	22.5
C	1.7	1.6	46.1	85.9	22.7	52.9	83.2	49.1

Table 8.5 clearly shows the interdependence between the amount and intensity of students' homework and, presumably, the extent of their thinking and analytical activity on the one hand, and their critical approach to terminological problems and the efficiency with which they acquire and use specialised terminology on the other.

The participants of group A finished the entire amount of the planned independent work, which was marked by a high level of their cognitive and analytical activity. The participants in Group B demonstrated less intense thinking and analytical activity than those in Group A, but their overall level was still sufficiently high. The participants of group C merely completed half of the planned independent work, and their cognitive and analytical faculties exhibited a significantly lower level of intensity in comparison to the subjects of the other groups.

The quality of the test translations produced by participants is closely related to the level of independence they have shown in completing their homework (see above). Notwithstanding the fact that the levels in question exhibited a decline in comparison to the levels achieved in their homework assignments, this phenomenon may be attributed to the temporal constraints imposed on the students during the test. It may result in certain students, particularly those with imminent deadlines, periodically referring to the MT version. Nevertheless, the correlation between the groups remains stable.

The test translations of the group A participants showed some signs of the formal approach inherent in the homework of the group B subjects: coincidences of shorter text fragments with the MT TT that were irregular, occasional repetition of MT errors and unnatural word order.

The quality of the test translations by Group B participants also deteriorated slightly, with a higher proportion of MT-edited fragments. Regardless of how significant their alterations to the MT text were, the connection to the latter was apparent. However, the discrepancy between groups A and B remained, with a consistent mean difference of 2.6 points for homework and 2.7 points for test translations. Participants in Group C did not demonstrate greater independence in their test translations than in their homework, with their independence rates remaining low at 1.6 and 1.7 points.

A good correlation has been found between the level of critical approach to terminological problems exhibited by the participants and the efficiency of the solution they provided in the test translation. The highest independence rate in their homework and test translations was displayed by the group A participants (9.6 and 7.5 points respectively), and the highest index of terminological accuracy was also achieved by them (70.7%). In a similar vein, the Group B participants, who ranked second in terms of independence rate (7.0 and 4.8 points respectively), also occupy second place on the terminological accuracy index (50.8%).

The fact that the participants in Group C scored so low in both the homework test (1.6 points) and the translation test (1.7 points) is striking when you consider that their average terminological accuracy of 46.1% is only 4.7% lower than that of Group B. The groups differ significantly in terms of independence rates, so it is reasonable to expect a corresponding difference in the accuracy of their terminology. Nevertheless, this paradox is explicable – the relatively elevated terminological accuracy index in group C is attributable to their predominant reliance on the MT variants. As the MT variant proved satisfactory in a quarter of cases, it had a beneficial effect on the accuracy index of Group C participants, who predominantly expressed a preference for the MT options.

The comparison of the terminological accuracy rate in cases where the MT options were acceptable versus those where they were not makes this more evident. As shown in table 8.5, the group C participants' precision rate (85.9%) in the first scenario (acceptable MT options) is nearly equivalent to the comparable rate in group A (87.9%) and even surpasses that of group B (77.3%). Nevertheless, this phenomenon can be attributed to the observation that the Group C participants invariably tend to emulate the MT option, and if this option is deemed permissible, it enhances their overall accuracy rate. For instance, concerning the suitable MT choices, the Group C members replicated them in 83.2% of instances, i.e. they employed alternative suitable versions in just 2.7% of cases. By contrast, the variants of the group A participants coincided with the MT options in only 31.5% (out of 87.9%) of cases, and a similar picture emerged in group B, where the variants coincided with the MT options in just 36.4% (out of 77.3%) of cases. In the other instances, the participants of groups A and B made use of different acceptable options.

This finding is supported by the subjects' performance when the MT suggested unacceptable choices. In this case, the participants' use of terminology is more consistent across different groups, with Group A using terminology 63.0% of the time, Group B using it 46.6% of the time, and Group C using it 22.7% of the time. The difference between Group A and B is 16.4%, between B and C is 23.9%, and between A and C is 40.3%. The benefit of Group A and B members in the significant approach to terminology issues is even more obvious if we examine the frequency of unacceptable MT choices among participants from different groups. This rate shows that group C participants rely on MT to translate every second term, even in situations

where the acceptability of the machine options is doubtful, whereas groups B and A may only do so for every fifth and seventh term respectively.

Overall, the coincidence rate analysis demonstrates the undeniable benefit of the students who displayed a higher level of cognitive and analytical effort during the whole period of study. The average rate of coincidences with the MT options was over 21% in group A, over 33% in group B and almost 53% in group C. The considerable difference in participants' independence and efficiency in solving terminological problems among the various groups of students allows us to assume that this difference is caused by the intensity of thinking and analytical activity of the participants. In combination with the modified

8.4. Conclusions

This chapter aimed to analyse the impact of machine translation post-editing (MTPE) on students' professional development in online translator training. This analysis focused on specialised translation from English into Ukrainian within the field of psychology. We sought to verify the hypothesis that MTPE, when combined with a modified TAP procedure, would stimulate students' thinking and analytical activity during the learning process. We anticipated that this approach would reduce students' dependence on MT and improve their human translation skills, resulting in higher-quality translations in terms of accuracy, translation speed, subject matter comprehension, and critical thinking when solving terminological problems.

The analysis showed that the said combination of MTPE and TAP may be a promising venue to reach the said aims.

Specifically, it demonstrated that MTPE positively impacts translation accuracy. Participants with low activity levels had an average of 4 times more errors than high-level students and over 2.5 times more than moderate-level students. Similarly, high-intensity MTPE positively correlates to translation accuracy.

It was also revealed that regular MTPE contributes to an increase in translation speed due to the high intensity of students' analytical and thinking activities. On average, students with the highest level of analytical and thinking activity translate 4% more of the source text per unit of time than students with a moderate level, and 10% more than students with a low level.

Regular MTPE improves subject knowledge (see Chapter 9). A better understanding of the source text enables it to be reproduced more accurately in the target text. When subject knowledge is present, mistakes are rarely due to a poor understanding of the source text or the selection of incorrect terms. Conversely, students with insufficient MTPE practice often misinterpret the source text or select inappropriate terms.

The study revealed a correlation between students' MT-independence and the intensity of their analytical and cognitive activity, provided by regular MTPE. The analysis showed that, even when the numeric parameters of MT reliance appear acceptable, the actual difference between students with varying levels of MTPE intensity may be more significant. Participants with a low level of MTPE intensity were more likely to try to conceal their reliance on MT using various covert post-editing strategies, such as rearrangement, synonym substitution, word transposition, deletion and addition.

There is also a strong correlation between the depth of students' analytical and cognitive processes and their ability to resolve terminological issues in translation. Higher intensity levels have been found to directly improve students' success rate, particularly when faced with increasingly complex problems. However, such conditions can cause students to place excessive trust in MT options if they lack sufficient independent work experience and the necessary terminology.

CHAPTER 9
THE IMPACT OF SUBJECT KNOWLEDGE ON THE LEARNING AND TRANSLATION OF ENGLISH LEGAL TERMINOLOGY

9.1. Introduction

Translators who specialise in a particular field need to possess subject knowledge. This means knowing the basic concepts in a specific subject area. They also need to be familiar with the terminology used to describe these concepts. It is self-evident that an inadequate amount of terms in the translator's lexicon will have a deleterious effect on the client's acceptance of the target text. Moreover, a lack of domain-specific knowledge can result in an incomplete understanding of the source text (ST), meaning the ST meaning cannot be fully rendered in the target text (TT) (Chernovaty & Kuprienko, 2017). Therefore, domain-specific knowledge and command of the appropriate terminology are both important for achieving high-quality translations. This is an area that requires further study, particularly in the training of prospective translators.

The significance of terminology in translation, as well as in translator training, has been a subject of inquiry by numerous researchers (L'Homme, 2017; Brewis, 2022; Elaz, 2022; Katar, 2022; Sauquet, 2022; Aldawsari, 2023; Boulanger & Gagnon, 2023; Vezzani, 2023; Rodríguez, 2023; Hongli et al, 2024; Li, 2024; Zhou & Hu, 2024).

A study of terminology on English and Spanish auction websites (Rodríguez, 2023) showed that, while bilingual vocabulary in this field is highly similar, this does not mean Spanish terms should be translated literally. Similarly, Zhou and Hu (2024) analysed Chinese and English terminology in the field of law and highlighted the need for legal term alignment. The study by L'Homme (2017) showed that three perspectives (terminography, text-based approaches and lexicography) contribute to the specialised combinatorics and the overall theoretical enrichment of terminology. Aldawsari (2023) identified three key issues in this field: selecting the correct terms, ensuring consistency between bilingual counterparts, and

incorporating variation awareness. Furthermore, it was demonstrated that tools employed in language studies and word matching can facilitate the comprehension of specialised terminology (Vezzani, 2023).

Various authors have also studied the value of domain-related knowledge and how translation students can acquire it. For example, Sauquet (2022) proved the importance of the translator's socio-cultural negotiation in overcoming the barriers posed by cultural differences in professions and institutions in the contacting cultures. Several studies (Hongli et al., 2024; Li, 2024) analysed problems in translating Chinese medicine terms into English, focusing on various strategies for aligning and diverging domain-specific knowledge. Brewis (2022) and Katar (2022) emphasise the importance of subject knowledge for university lecturers providing interpreting services and translating medical texts, respectively. Boulanger and Gagnon (2023) investigated translator training in economics and finance and found that subject knowledge acquired through discourse analysis played a favourable role in understanding the extensive context of the financialised economy. Elaz (2022) had previously emphasised the importance of this, proposing a comparative terminology course to develop the intercultural intelligence of translation students.

Research has been carried out into issues such as the value of terminology and subject knowledge in translation, and the evolution of a translator's professional competence. However, these aspects have mostly been examined in isolation, rather than as part of a broader context. Given the close connection between these two factors, it is important to examine their relationship, especially in the context of translator training. Consequently, our investigation aimed to determine the effect of students' subject knowledge on their learning and use of English terminology. It also aimed to evaluate the effectiveness of approaches to guarantee acquisition of this knowledge and associated terminology.

9.2. Materials and Methods

To accomplish this objective, a specially designed study was undertaken in teaching specialised translation from English into Ukrainian. Thirteen fourth-year students specialising in English language and literature (including translation) at V.N. Karazin Kharkiv National University (Ukraine) took part in the research. The study took the form of a natural experiment within the

framework of a compulsory legal translation course, consisting of 62 academic hours (32 contact hours and 30 hours of homework) included in the curriculum.

The influence of subject knowledge on translation efficiency was examined by assigning students weekly tasks, emphasizing the learning and application of legal terminology in mediation contexts. These tasks included creating conceptual diagrams for the texts they were working on.

A conceptual diagram is a visual tool that maps out the main ideas and the semantic links between them within a given text. For example, Figure 9.1 presents a conceptual diagram for *The US Common Law*, created by participant A3.

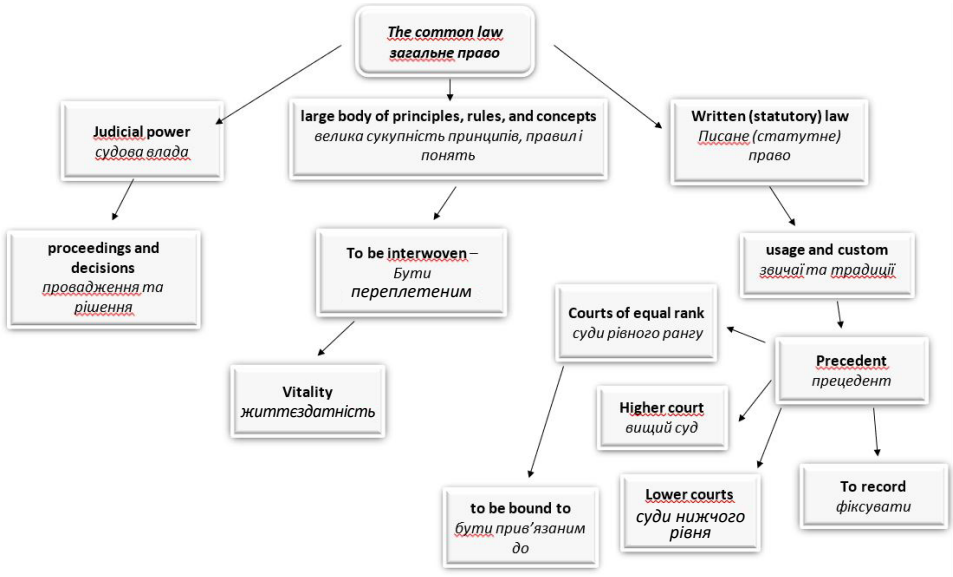

Figure 9.1. Conceptual diagram of the text *The US Common Law*, created by participant A3.

Each week, students submitted their conceptual diagrams along with the corresponding translation assignments via Google Classroom, where the materials were documented and analysed. The analysis results were then compared to assessment outcomes, focusing on errors caused by misunderstanding the source text (ST) and on the accuracy of terminology used. While producing conceptual diagrams was optional, they were considered in the final grading, and students were aware of this policy.

In the classroom, conceptual diagrams were also employed to activate relevant subject knowledge and terminology through role-playing activities. In these exercises, one participant's conceptual diagram was shown while they acted as a speaker describing it, and others served as consecutive interpreters, conveying the corresponding part of the speech in the target language. This approach offered additional opportunities to reinforce subject knowledge and terminology, proving especially helpful for those who frequently practiced such tasks at home.

The study aimed to test the following hypothesis: Consistently preparing conceptual diagrams for texts translated by participants in the field of the U.S. legal system would enhance their mastery of relevant subject matter and terminology. This, in turn, would lead to better comprehension of source texts and their more accurate reproduction in target texts.

To evaluate this, participants were divided into three virtual groups according to the proportion of diagrams they completed during the module:

- Group A: over 80% of diagrams prepared
- Group B: 40–79%
- Group C: less than 40%

This categorization resulted in five participants (38%) in Group A, four (31%) in Group B, and four (31%) in Group C. The average completion rates were 97% for Group A, 52% for Group B, and 26% for Group C.

At the module's conclusion, participants translated a 243-word text on the relevant topic, adapted from Burnham & Reed (2021). The text contained eight segments and 24 terms that could present conceptual or terminological challenges. An analysis of each participant's performance follows.

9.3. Results and Discussion

Fragment 1 (understanding the following bolded and numbered terms requires specialised knowledge of the US legal system, and translating them demands awareness of the relevant terminology in the target language):

Generally, ***lawyers*** *(1) will not object even if the* ***other side*** *(2) is transgressing some of the limitations during* ***final argument*** *(3), but this is not a* ***legal restriction*** *(4), only a traditional courtesy* (expected translation:

Загалом адвокати (1) не заперечують, якщо супротивна сторона (2) порушує певні обмеження під час прикінцевих аргументів (3), але це не є наслідком дії будь-яких юридичних обмежень (4), а просто прояв традиційної ввічливості).

The overall translation accuracy of term 1 (62%) was distributed evenly across the subject groups. All subjects in Group A translated it correctly (адвокати), while the translation accuracy in Group B was 75%. P3 translated it using a broader term юристи*,* as did all participants in Group C. The incorrect choice of equivalent can be explained by a lack of subject knowledge, since in the context of a court hearing, the term *lawyer* has the equivalent of *адвокат*, whereas in a broader context, it is *юрист*. All subjects in Group A and most in Group B recognised this fact: Participant B4, who submitted the fewest conceptual diagrams (42%), was the only one in Group B to choose the incorrect equivalent. None of the Group C participants were aware of this difference and therefore all chose the most common equivalent, *юристи*.

The translation of term 2 (*the other side*) required an understanding that, since other parties besides the plaintiff and defendant may be involved in a lawsuit, the context required specification of the party referred to, namely *супротивна сторона*. Only 40% of Group A participants with the highest number of prepared schemes realised this, while the rest translated the term literally as *інша сторона*, ignoring the context, which led to ambiguity in the translation. Thus, the overall accuracy of the translation of this term was only 15%, due to an inability to update relevant subject knowledge.

The translation of term 3 (*final argument*), which has a clear equivalent in Ukrainian (*прикінцеві аргументи*), did not cause any difficulties for participants in Groups A and B, who had encountered this term repeatedly while compiling conceptual schemes. However, it proved difficult for all participants in Group C, who offered alternatives that were semantically understandable but terminologically incorrect (*остаточна суперечка, заключна промова, остаточна промова, фінальна промова*). This indicates the absence of both relevant subject knowledge and the terms to denote it in their minds.

Despite its apparent simplicity, term 4 (*legal restriction*), and its expected equivalent юридичні обмеження, unexpectedly caused difficulties for participant B4, who had prepared the fewest diagrams (42%), as well as for all participants in Group C, who had the lowest diagram submission

index: обмеження за законом, законодавчі норми, юридичне правило, законодавча обмеженість. This resulted in an overall accuracy rate of 62% for this term.

Fragment 2: *Most effective* ***closing arguments*** *(5) will focus the case by setting aside* ***uncontested*** *(6) or less important issues and pointing out the real issues in the case* (expected translation: Найефективнішим є той *прикінцевий аргумент (5), який зосереджується на суті справи, ігноруючи менш важливі питання, та* ті, *що не обговорювалися (6), і концентруючись на* насправді важливих пунктах).

Term 5 (*closing arguments*), a variant of term 2 with the same target language counterpart, was correctly translated by 80% of Group A participants, and 50% of Groups B and C participants. Participants A3, B4 and C1 suggested the terms заключні аргументи, кінцеві аргументи промови and заключні промови respectively. Thus, the overall translation accuracy of this term was 62%, which is four times higher than that of term 2. This can be explained by the general instability of the participants' ability to recall corresponding words from their bilingual lexicon at this stage of development.

Translating term 6 (*uncontested issues*) into its expected counterpart (*питання, що не обговорювалися*) required rethinking the context, which none of the participants managed to do. The participants offered versions that differed significantly in meaning: *беззаперечні* (A1, B2, C3), *незаперечні* (A2), *безспірні* (A3, B3), *безперечні* (A4, A5, B4, C1, C4), *які неможливо оскаржити* (B1), *безсумнівні* (C2).

Fragment 3: (*Most effective closing arguments*) *argue the issues that have been brought into focus by carefully organizing the evidence that supports each of them and, where there is a* ***conflict*** (7)*, explaining to the* ***jury*** (8) *why it should accept the* ***arguing party's version*** (9) *over the* ***opposing party's version*** (10) (expected translation: (Найефективнішим є той прикінцевий аргумент)*,* що обґрунтовує питання, які є суттю справи, завдяки ретельному викладу доказів, що свідчать на їхню користь, а у випадку наявності *суперечності* (7)*, пояснює присяжним* (8)*,* чому слід прийняти версію *сторони, яка виступає* (9)*,* а не версію *супротивної сторони* (10)).

Term 7 (*conflict*) was translated correctly by 60% of Group A and 25% of Group B; the remaining participants predictably transcoded it as конфлікт. Accordingly, overall accuracy was only 31%, and there is little doubt that it depends on the students' subject knowledge.

Term 8 (*jury*) did not generally cause any difficulties (85% correct), but two participants in Group C (C1 and C4) translated it as суд присяжних, indicating their inability to distinguish between the two terms. This correlates with the participants' low conceptual diagram preparation rates (33% and 12%, respectively).

Term 9 (*arguing party)* was generally coped with by all participants in Group A (*сторона, що наводить докази; аргументуюча сторона; сторона, що виступає; сторона, що викладає свою думку*), as well as 50% of participants in Group B (сторона, що надає аргументи; сторона, що доводить). The unsuccessful options offered by the remaining participants (*сторона, що сперечається; та чи інша сторона; сторона відповідача; суперечна сторона*) indicate a lack of subject matter knowledge, in this case, regarding the stages of a court hearing. In turn, this lack can be attributed to the low rates of conceptual diagram preparation by these participants (from 12% to 40%).

Using semantically understandable equivalents of term 10 (*opposing party*) indicates a general understanding of the English-language term. However, using the normative equivalent (*супротивна сторона*) is rare among group A participants, with only one participant using it. This suggests that the majority of participants do not have this term in their lexicon.

Fragment 4: (*Most effective closing arguments*) *relate the* ***evidence*** *(11) the jury has just heard to the* ***principles of law*** *(12) the jury must apply as set out in the* ***jury instructions*** *(13)* (expected translation: *(*Найефективнішим є той прикінцевий аргумент), що співвідносить свідчення *(11), щойно* почуті присяжними, з *правовими нормами (12),* які вони повинні застосувати відповідно до *напутнього слова судді присяжним (13)*).

Term 11 (*evidence)* can be translated as *свідчення* or *докази*, depending on the context. In this case, the term should be translated as *свідчення*, as it is the only one that is combined with the verb *hear* (*почуті присяжними*). Context was considered only by 60% of the participants in Group A with the highest conceptual diagram submission index (100%), and the rest of the participants translated it as докази.

Term 12 (*principles of law*) and its expected equivalent *правові норми* were correctly translated by only 40% of participants in Group A, who had the highest submission rates for conceptual diagrams. Most of the other participants either transcoded the source phrase (принципи права) or offered

unacceptable alternatives (*норми закону, законодавчі норми*). Thus, the overall accuracy of this term was only 15%.

Term 13 (*jury instructions*), with its expected Ukrainian equivalent, *напутні слова судді присяжним*, was correctly translated by 60% of participants in Group A, who had the highest levels of conceptual diagram submission. One participant in Group B also achieved the same result. The rest offered inaccurate terms, such as *вказівки для присяжних, інструкції присяжним* and *настанови для присяжних*, which suggests that participants do not understand who gives these instructions to whom. In some cases, it seems that the instructions are given by the jury themselves (*напутні слова присяжних, інструкції присяжних*) or the term *настанови* was offered, which is the vaguest. A lack of understanding of the content of the court hearing resulted in a low level of accuracy for this term (31%), especially among participants with low levels of conceptual diagram preparation.

Fragment 5: ***Closing argument*** (14) *is sometimes referred to as* ***summation*** (15)*, but that is misleading* (expected translation: *Прикінцевий аргумент* (14) іноді називають *узагальненням* (15)*,* але це – хибна думка).

Regarding term 14, 60% of participants in group A used it correctly (incorrect versions of *заключні аргументи* and *заключні промови* were recorded in participants A3 and A4, respectively. Group B achieved 75% correctness (one incorrect version of *заключний аргумент* was recorded in participant B4), and Group C reached 25% accuracy (three incorrect versions *заключний аргумент, фінальний аргумент* and *заключні промови* were recorded in participants C1, C2 and C4, respectively).

Term 15 (*summation), with* its expected contextually appropriate equivalent *узагальнення,* was translated correctly by 23% of participants with a high level of conceptual diagram preparation (A1, A2 and B1). For the rest, the translation of this term caused some difficulties, probably due to its form, which looked tempting for transcoding (*sum – сума*) and led to the variants *підсумування* (A4, B3, *B4* and *C2)* and *підсумок* (C1). Others, mostly those with a low level of conceptual diagram submission rate, probably borrowed their version from the machine translation text (*підбиття підсумків*).

Fragment 6: *A good* ***closing argument*** (16) *will not just* ***summarize the evidence*** *(*17); *it will organize it and* ***argue*** (18) it (expected translation: Вдалий *прикінцевий аргумент* (16) передбачає не лише *узагальнення свідчень* (17), але і їх ефективні організацію та *аргументацію* (18)).

The correct use of term 16 in this passage (group A: 60%; group B: 75%; group C: 50%) is clearly related to the indicators of the conceptual diagram preparation, as it has already occurred in previous passages (see terms 2, 5 and 14).

Regarding term 17 (*summarize the evidence*), whose components had already been encountered earlier (term 11: *evidence*; term 15: *summation*), the expected translation was *узагальнення свідчень.* In Group A, 60% of participants correctly translated both components of this term, while the rest suggested *підсумування доказів* (see the comments on terms 11 and 15 above). In Groups B and C, half of the participants correctly translated *summation* as *узагальнення*, while the other half preferred підсумування. All participants translated *evidence* as докази instead of the normative in this context *свідчення*.

Given the context, it was anticipated that term 18 (*argue*) would be translated as *аргументувати* or *обґрунтовувати*, depending on the sentence structure in the target language. Of the participants, 100% of Group A, 75% of Group B and 25% of Group C correctly interpreted and translated this term. In all cases of a failed translation, participants chose the incorrect contextual meaning of the term (*оспорювати*), which confirms our assumption about the influence of subject knowledge on translation quality.

Fragment 7: *In all but the longest and most complicated trials,* ***lawyers*** (19) *who start out their* ***closing argument*** (20) *by announcing that they will now summarize all the* ***evidence*** (21) *the* ***jury*** (22) *has heard will be greeted by anguished facial expressions and then bored looks from jurors who already know the* ***evidence*** (23) *well* (expected translation: Якщо під час будь-яких судових слухань, за винятком особливо тривалих і складних, *адвокат* (19) розпочне свій *прикінцевий аргумент* (20) заявою про намір узагальнити усі почуті *присяжними* (22) свідчення (21)*, то побачить на обличчях присяжних змученість, а в їхніх поглядах нудьгу, оскільки вони й так уже добре знайомі з цими* ***свідченнями*** (23).

Term 19 (*lawyers*) had already appeared in the text, and its interpretation was identical to that of the previous case (see term 1). Participants B4 and all students in Group C rendered it with the broader term *юристи* instead of the more appropriate, and narrower, term *адвокати*. The rest of the participants chose the term required by the context.

Term 20 appears in this text for the fifth time (see terms 2, 5, 14 and 16) and is highlighted here again to show the consistency in its use by the same participants in different fragments. In Fragment 7, the overall efficiency of its translation is 62% (Group A – 80%, B – 75%, C – 25%). Analysing the dynamics of the translation of this term in five different fragments reveals the following accuracy rates for each group: Group A – 76%, B – 75%, C – 30%). There is a clear correlation between the intensity of work on conceptual diagrams (and presumably the amount of subject knowledge acquired) and the ability to correctly understand the context and choose the appropriate equivalent in the target language.

A similar trend is observed with regard to individual indicators. In Group A, 60% of participants (A1, A2 and A5) used the same correct term in all five cases. Participant A4 provided the correct answer in two cases (50%) (*прикінцевий аргумент*), and offered alternative variants in three more cases (*заключний аргумент, заключні промови* and *промови*). Participant A3 was the only one to consistently use the incorrect option (*заключні аргументи*) in three out of five cases, though she did use the correct option twice.

In Group B, 50% of participants (B1 and B3) used the same correct term in every case. Another participant (B2) did so in four out of five cases, and a fourth participant (B4) used five different equivalents, one of which was correct: *прикінцевий аргумент, заключні аргументи, заключний аргумент, заключна промова* та *кінцевий виступ.*

Finally, none of the participants in group C used the same term in all five cases. Participant C3 used the correct term in three situations, but offered unsuccessful options (*заключна промова* and *остаточна промова*) in the fourth and fifth. Participant C2 succeeded in three cases (60%), but used incorrect variants (*заключна промова* and *фінальні аргументи*) in the remaining incidences. The other participants in this group used incorrect options in all the fragments: C1 offered *остаточна суперечка, заключні аргументи* and *заключний аргумент*; C4 suggested *фінальна промова, заключна промова* and *заключні промови*.

Thus, with regard to this term at least, we can safely assume that there is an obvious connection between the intensity of conceptual schemes preparation, the amount of subject knowledge acquired, the understanding of the ST content and the correct use of terms to denote components of subject knowledge.

The lexeme *evidence* (terms 21 and 23) had to be translated as *свідчення* in both cases, and the accuracy of its translation was 60% in Group A in both cases. The remaining errors were due to unsuitable contextual variant *доказ*. In Group B, the said accuracy decreased to 50% for term 21 and to 25% for term 23. In Group C, all participants chose the inappropriate term *доказ* in both cases.

Term 22 (*jury*) was correctly translated as *присяжні* by all participants in Group A, 75% of participants in Group B, and 25% of participants in Group C, giving an overall accuracy rate of 69%. The rest translated the term as *суд присяжних*, which can be explained by a failure to distinguish between these concepts in a particular context, and may also be due to the participants' limited subject knowledge in Groups C and (partially) B. These students also had the lowest conceptual diagram submission rate.

Fragment 8: *What most jurors want and need is some guidance on what the* ***evidence*** (24) *means* (expected translation: Те, чого хочуть і насправді потребують більшість присяжних, — це певне пояснення значення таких *свідчень* (24).

Term 24 appears in this text for the fifth time (see terms 11, 17, 21 and 23), and is highlighted again here to demonstrate consistency of use by the same participants across different fragments. In Fragment 8, the overall efficiency of the translation is 46%. Group A – 80%; Group B – 50%; Group C – 0%. Analysing the dynamics of the translation of this term in five different fragments reveals the following overall accuracy of its rendering by group: Group A – 64%; Group B – 25%; Group C – 0%. As in previous cases, there is a clear correlation between the intensity of conceptual diagram preparation activity and the ability to choose the correct equivalent in the target language.

A similar trend is observed with regard to individual indicators. In Group A, 40% of participants (A1 and A2) used the correct term consistently, while participant A3 achieved an accuracy of 60%, participant A4 – 20%, and participant A5 – 40%. In Group B, the accuracy was 50% for participants B1 and B2, 25% for B3, and 0% for B4. All participants in Group C chose variants that were inappropriate in context.

Once again, we see an obvious connection between the intensity of conceptual diagram preparation and terminological accuracy in translation.

9.4. Conclusions

This study aimed at the verification of the hypothesis that consistent preparation of conceptual diagrams for texts translated by participants in the field of the U.S. legal system would enhance their mastery of relevant subject matter and terminology. This, in turn, would lead to better comprehension of source texts and their more accurate reproduction in target texts.

The experimental training confirmed the hypothesis. There was a direct correlation between students' regular diagram-making and their proficiency in the subject matter within the US legal system. It also applied to their understanding of the source text content and its reproduction in the target text. This accuracy included the use of relevant terminology.

Group A demonstrated the highest regularity in preparing conceptual diagrams (97%) and exhibited the highest level of terminological accuracy (70%) and consistency. Group C exhibited the lowest regularity in preparing conceptual diagrams (12%) and demonstrated the lowest levels of terminological accuracy (13%) and consistency. Group B's terminological accuracy (45%) is 25% lower than Group A's and 32% higher than Group C's. This aligns with our initial assumptions, and we expect an increase in terminological accuracy if the proposed methodology is used over a longer period.

Students' regular preparation of conceptual diagrams and subsequent filling of these with relevant terminology may facilitate the spontaneous acquisition of subject knowledge. This, in turn, contributes to a more comprehensive understanding of the source text's content. In addition, this approach may lead to the spontaneous memorisation of terminology in close connection with the concepts of the relevant field. It can also help them develop translation strategies that focus on the source text's deeper meaning. The lack of subject knowledge makes it hard to understand the source text fully. This can affect a student's ability to translate effectively, leading to the use of the inappropriate terminological options in the target language.

The study's findings are preliminary due to several constraints. These include the brief observation period, limited number of participants, one-way directionality, narrow subject area, relatively small size of the source text and corresponding term corpus. The prospect of future research is to overcome these and other limitations.

CHAPTER 10
OVERCOMING STUDENTS' STEREOTYPES

10.1. Introduction

As noted earlier, machine translation (MT) is widely used by translation students, particularly those aiming for careers in philology, both in coursework and during exams. However, opinions on this practice vary among teachers and students. A modern translator's professional competence should encompass both technological skills (including proficiency with automated translation tools) and human translation abilities, as well as specialized knowledge relevant to the domain of activity (e.g., Economics, Law, or Translation Studies; see previous chapter).

While MT and similar tools are now a standard element of a translator's skill set and an essential part of training, mastery of such systems does not guarantee high-quality translations. Without developing their own translation abilities, translators risk becoming fully dependent on these tools, making their work impossible if the systems become unavailable (e.g., due to loss of internet access).

Moreover, the supposed magic capabilities of translation software are often overstated. Even the most advanced programs suffer from significant limitations, especially their lack of domain-specific knowledge, which is crucial for interpreting implicit meanings (implicatures) in the source text. Without this understanding, producing an accurate or even clearly comprehensible target text becomes challenging.

10.2. Method

To enable a more sophisticated investigation of this assertion, it is beneficial to contemplate a number of demonstrative instances. The aim of this chapter is to conduct a translatological analysis of machine-translated source-text fragments related to translation studies (Seeber, 2023; Ferreira, 2023). These fragments contain implicatures that are crucial to understanding them.

10.3. Results and Discussion

First, let's consider the title of an article (Seeber, 2023) in the field of translation studies, as rendered by two neural MT programs: *DeepL Translate* (*DLT*) and *Microsoft Translate* (*MST*): *Capacity, load, and effort in translation, interpreting and bilingualism.*

The expected Ukrainian translation of this title is Обсяг внутрішніх ресурсів, навантаження та зусиль у письмовому й усному перекладі та білінгвізмі, yet both programmes failed to correctly interpret *capacity* due to a lack of contextual awareness (Gile, 2009). While the human translator can determine the meaning of this term by reading the paper, the MT systems cannot: *DLT* chose потенціал and *MST* – спроможність. Both options convey only the general meaning of the term, without considering the context.

The programmes struggled with rendering *translation, interpreting and bilingualism*, although these are common terms. They both mistranslated the term *bilingualism*, rendering it as двомовний переклад (*bilingual translation*), though bilingualism doesn't cover the concept of translation (Valdez & Figueora, 1994; Gottardo & Grant, 2008).

The MST programme, unlike the DLT, did not consider context when rendering the term *translation*. It used the generic meaning of the term (переклад), which includes both oral and written forms. In this context, however, this term is used in contrast to *interpreting*, and denotes *written translation* (письмовий переклад). Without this contextual consideration, the option proposed by the MT program would lose its meaning, including the distinctions between translation, interpretation and bilingualism.

Analogous tendencies may be discerned in the translation of other texts pertaining to translation studies. Consider, for instance, the title of another article (Ferreira, 2023): *Directionality in cognitive translation and interpreting studies*.

This title was translated into Ukrainian by the Google Translate (GT) programme as *Спрямованість у когнітивному перекладі та усному перекладі* (literally: *Focus in cognitive translation and interpretation*), which is an entirely inadequate rendering. This inadequacy relates to the implicatures in the heading.

The machine searches its dictionary for the equivalent of the first word, *directionality*. It may identify several options, e.g.: спрямованість (*aiming*), фокус (*focus*), фіксування (*fixation*), концентрація (*concentration*), особливості (*specifics*), увага (*attention*), орієнтація (*orientation*), and зосередженість (*focus*). Unfortunately, none is appropriate here as this article concerns the direction of translation and interpretation, from one language to another. The translator must find a contextual meaning where it is not in the dictionary. The MT software cannot help here

The programme failed to process the double ellipsis in the headline either. The full version of this part of the title would have read (the omitted elements are shown in bold): *cognitive translation* ***studies*** and ***cognitive*** *interpreting studies*. However, the software translated each phrase separately, ignoring implicit information. The rendered phrases did not match the source text. The word *studies* was omitted. The rendered heading in reverse translation was *Focus in cognitive translation and interpreting*, which was not the intended meaning.

After reconstructing the implicit elements in the ST, the full version of the heading will have the following form: *Directionality of translation and interpreting in cognitive translation studies and cognitive interpreting studies*. While the programme would have no difficulty in rendering this full version, the problem is that it cannot recognise it in the compressed form of the original headline.

The following analysis examines the accuracy of the translation from English to Ukrainian of a short (116-word) excerpt from a text on translation psychology (Shreve, 2006b), as produced by *DeepL Translate* (DLT) software (see Table 10.1).

Table 10.1. Comparison of the source and target texts translated by *DeepL Translate* software. Errors in the target text are highlighted in italics and numbered.

Source text	Target text (*DeepL Translate*)
The deliberate practice: translation and expertise The field of expertise studies in cognitive psychology proposes that expert performance in cognitive skill domains such as chess, computer programming, or systems analysis is enabled by distinctive cognitive resources that allow "consistently superior performance on a specified set of representative tasks for the domain that can be administered to any subject" (Ericsson and Charness 1997). These resources are accumulated within the framework of deliberate practice, engagement in regular activities that are specially designed to improve performance. The cognitive resources that underlie expertise arise from the operation of pattern recognition, problem representation, "chunking", schematization and knowledge proceduralization processes on the contents of episodic memory over long periods of deliberate practice.	***Навмисна*** (1) ***практика: переклад та експертиза*** (2) Дослідження *в галузі когнітивної психології* (3) припускають, що *ефективність фахівців* (4) у таких сферах когнітивних *навичок* (5), як шахи, комп'ютерне програмування або системний аналіз, забезпечується *особливими* (6) когнітивними ресурсами, які дозволяють *«послідовно* (7) досягати *вищих* (8) результатів у виконанні певного набору репрезентативних для даної сфери завдань, які можуть бути *запропоновані* (9) будь-якому суб›єкту» (Ericsson and Charness 1997). Ці ресурси накопичуються в рамках (10) цілеспрямованої практики, залучення до регулярної діяльності, спеціально розробленої для покращення *продуктивності* (11). Когнітивні ресурси, які лежать в основі експертизи, *виникають* (12) в результаті *роботи* (13) процесів розпізнавання *образів* (14), *репрезентації* (15) проблем, «шматування (16)», схематизації та *процесуалізації* (17) знань на основі *вмісту* (18) епізодичної пам'яті протягом тривалих періодів цілеспрямованої практики.

As can be seen from Table 10.1, there were found at least 18 errors in the target text. These are analysed below.

(1) *Deliberate practice* is translated as *навмисна* (instead of *цілеспрямована*), which does not take into account the stages of a specialist's development, the last but two of which is *deliberate practice*. This is translated by the commonly used word *навмисна*, which is ambiguous. In the other two cases, however, this phrase is translated correctly. Conclusion: The programme does not ensure that the context is taken into account when

selecting different meanings of the same word in the source language, nor does it ensure consistent terminology.

(2) *Expertise* is translated as *експертиза* instead of *professional level* (failure to consider the difference in meanings of the homonyms *expertise* in English and *експертиза* in Ukrainian – in the latter, the term means "study of a matter or issue in order to make a correct conclusion" (Dictionary of Ukrainian Language, 2024). In this context, the stages of development of a professional competence, the last of which is the professional level – *expertise*, are not taken into account). Conclusion: due to the lack of relevant subject knowledge, the programme does not consider the data of the relevant theory, and also tends to transcode homonyms in two languages without taking into account the differences in their meanings.

(3) *The field of expertise studies in cognitive psychology* is translated as *Дослідження в галузі когнітивної психології,* i.e. the ST refers to studies of professional competence in cognitive psychology, while the translation refers only to studies in cognitive psychology. Thus, the object of research (*фахова компетентність*) has been removed from the TT, which significantly changes the content of the TT compared to the ST. Probably, the programme failed to reconcile the relationship between the two semantic blocks (*expertise studies* and *in cognitive psychology*), and as a result, it deleted the word *expertise*, leaving only the phrase *studies in cognitive psychology,* which it understood. Conclusion: the program can simplify the content of ST's message by removing elements it does not understand. However, the TT remains grammatically correct and semantically valid. Therefore, the TTs of this programme require careful post-editing.

(4) The programme translates *expert performance* as *експертна діяльність* (instead of *діяльність на фаховому рівні*), which indicates a lack of relevant subject knowledge and an inability to understand the relationship of this phrase to the levels of development of professional competence. Conclusion: due to a lack of subject knowledge, the programme tends to translate phrases literally without considering the context.

(5) *Skill* is translated as *навичка* (instead of *уміння*), which is required by the context and changes the meaning of the original term. In Ukrainian, *навичка* refers only to the automated components of an activity, whereas in the source text, it refers to a person's broader ability to use their acquired skills and knowledge to perform a certain activity. Conclusion: due to a lack of subject knowledge, the programme does not ensure that context is

taken into account when selecting different meanings of the same word in the source language.

(6) The first word of the phrase ***distinctive*** *cognitive resources* is translated by the commonly used word *особливими* (instead of *певними*), which causes ambiguity, since there is nothing special about these resources. Conclusion: the software does not provide contextualisation when selecting different meanings of the same word in the source language;

(7) The first word of the phrase ***consistently*** *superior performance* is translated as *(**послідовно** (досягати… результатів*) instead of *стабільно*), which causes ambiguity, since послідовно means *step by step,* and *steadily* means *without change.* Conclusion: the software does not consider the context when choosing different meanings of the same word in the source language;

(8) *Superior performance* is translated as *вищі результати* (instead of *найвища ефективність)*, i.e. the superlative degree of comparison is unjustifiably replaced with a higher degree, which does not significantly change the meaning of the source term, but worsens the stylistic characteristics of the translated text (*досягати вищих результатів у виконанні*). Conclusion: The software does not ensure the stylistic consistency of the target text, which requires post-editing.

(9) *Be administered is* translated as *завдання, які можуть бути **запропоновані*** instead of *завдання, що можуть **трапитися***. This is a stylistically inaccurate choice of term in the source language due to awkward word combinations. In the course of professional activity, tasks (i.e. problems) *happen*, but not *are offered*. Conclusion: the programme does not ensure stylistic consistency in the TT, which requires post-editing.

(10) The collocation *within the framework of* is translated as a calque from Russian *в рамках* (instead of the normative *в межах* according to modern requirements)*,* which indicates the outdated vocabulary of the programme and the need for post-editing the MT TT;

(11) *improve performance* is translated as *покращення продуктивності (діяльності*) (instead of *підвищення її ефективності*), which indicates that the programme does not consider the differences between the terms *продуктивність* (quantitative result achieved by an employee) and *ефективність* (the ratio between the result achieved and the costs of achieving it). Conclusion: the program does not distinguish between words

that are similar in meaning, choosing inappropriate contextual equivalents and worsening the terminological accuracy of the TT, which requires post-editing;

(12) *Cognitive resources...* ***arise*** is translated as *когнітивні ресурси…* ***виникають*** (замість *когнітивні ресурси… формуються*), which indicates a lack of consideration of the context, where it is precisely about development, i.e. changing the nature (volume, quality, etc.) of the abovementioned resources as a result of the targeted impact of certain mechanisms, rather than their spontaneous emergence. Conclusion: the software does not ensure the terminological accuracy of the TT, which requires post-editing;

(13) *Operation* was translated as the phrase ***робота*** *процесів* (instead of ***вплив*** *процесів*), which is ungrammatical in terms of word combinability. Conclusion: the software does not take the combinatorial nature of lexical items into account when selecting different meanings of the same word in the source language.

(14) *Pattern recognition* is translated as *розпізнавання* ***образів*** (instead of *розпізнавання* ***закономірностей***), *which* alters the meaning of the source term. Conclusion: the programme does not consider the context when selecting different meanings of the same word in the source language;

(15) *Problem representation* is translated as ***репрезентація*** *проблем* (instead of ***узагальнення*** *проблем*), which causes ambiguity due to the ambiguity of the word *representation.* In this case, the correct translation required a contextual substitution, since there is no option for *узагальнення* among the possible Ukrainian equivalents of the English term *representation in* the dictionary. Conclusion: the programme cannot perform contextual substitution if the corresponding option is not recorded as a possible equivalent in the source language.

(16) The psychological term *chunking* is translated with the commonly used word *шматування* (instead of *фрагментація*), which makes it impossible for the addressee to understand the meaning of the TT. Conclusion: due to a lack of subject knowledge, the software does not consider context or style when selecting alternative meanings of the same word in the source language. It is possible that in this case, the correct option is absent in its lexicon altogether.

(17) the second word of the phrase knowledge ***proceduralization*** *recognition* was translated as ***процесуалізація*** *знань* (*instead of*

процедуралізація *знань*), which indicates the absence of relevant subject knowledge, thus disregarding the division of knowledge into declarative and procedural (subject knowledge) and changing the meaning of the source term. It is likely that the lexicon did not contain the term 'proceduralization' at all, so the machine replaced it with the closest derivative of the word 'process'. Conclusion: The programme does not consider the context when selecting a word in the source language. If there is no such word in its lexicon, it may replace it with the most similar word.

(18) *Contents* (*of* episodic *memory*) was translated as ***вміст*** (епізодичної пам›яті) *(*instead of ***зміст*** (епізодичної пам›яті), which indicates that the programme does not distinguish between the terms *вміст* (material content) and *зміст* (non-material content). Since memory content can hardly be classified as a material object, зміст seems to be a better match. Conclusion: the programme can replace words that are similar in form and thus does not ensure the terminological accuracy of the TT, which needs post-editing.

10.4. Conclusions

The preceding analysis has demonstrated that contemporary machine translation programmes are susceptible to significant systemic shortcomings stemming from a lack of subject matter expertise. This hinders their ability to grasp the intricacies of the source text within the broader context of the message.

The target texts generated by modern MT software are grammatically correct and semantically believable, which may give non-specialists the impression that they are reliable. However, an in-depth analysis of these texts, particularly specialised ones, reveals numerous quality assurance shortcomings that would prevent them from being published without significant post-editing. The most common of these are outlined below.

The programmes do not consider the context when selecting different meanings of the same term in the source language. Consequently, such term may be translated differently in different parts of the target text, thus violating the requirement for consistent terminology. This is most commonly due to a lack of relevant subject knowledge in the machine's memory, which prevents it from associating a particular term with the relevant theories (e.g. the

psychological structure of activity or the theory of professional competence development) and the terms used within these concepts.

When interpreting certain fragments of the source text, the software can apply various strategies, some of which are described below.

If it is unable to fully decode the meaning of the source text, the software may remove certain elements, thereby simplifying the structure of the target text. At the same time, the form of the target text remains grammatically correct and semantically believable.

The software tends to transcode homonyms in two languages (e.g. *expertise* and експертиза) without considering possible differences in meaning. It also mixes similar but not identical words in terms of form and meaning (e.g. вміст and зміст), and replaces options absent in its vocabulary with similar-sounding ones (e.g. using the invented term процесуалізація instead of процедуралізація)

The software cannot perform contextual substitution if the word in question is not recorded as its equivalent in the target language. Consequently, the potential for stylistic variation in the target text is severely limited, if not non-existent. Stylistic issues can include word-for-word translation without considering the context, stylistic heterogeneity in the target text, outdated elements in the programme's memory lexicon and inaccuracies in terminology.

To neutralise the negative impact of these factors on the quality of the translation produced by DeepL Translate, careful post-editing of the text is required, as well as awareness of this need among future translators during their training. Analysing MT systems' shortcomings can help students understand their limitations and develop a critical approach to machine-translated texts. These shortcomings can be considered in the pre-editing process and by MT programme developers when improving products. Research could explore specifying and incorporating these limitations into translator training.

CONCLUSIONS FROM PART 2

This section of the monograph explores the challenge of human–machine coexistence from a technohumanist perspective, which emphasizes the human-centered value of technological evolution and advocates for a balanced, mutual development of people and technology. The study focuses on a specific case: the interaction between student translators/interpreters and machine translation (MT). It examines what remains of human agency when part of their intellectual function – translation skills – is delegated to MT in online learning, and how this shift impacts them both personally and professionally.

The research analysed the learning behaviours of Ukrainian university students majoring in Translation/Interpreting, who, due to the COVID-19 pandemic and the ongoing war, have been studying online for over five years. A significant number regularly use MT in both independent and supervised tasks (translation and interpreting), even where such use is prohibited. Motivations include time-saving and a belief in MT's superiority over human translators.

To conceal their reliance on MT, students employ techniques such as synonym substitution, word reordering, additions and deletions, and syntactic restructuring. In interpreting, they practice covert simultaneous post-editing – editing MT output displayed on their screens while delivering the revised version in real time. However, excessive dependence on MT shifts responsibility for translation quality from the student to the machine, limiting the development of independent translation competence and making students unable to fully translate without technological aid.

While covert MT use fosters technological skills, balanced training requires reinforcing students' ability to translate and interpret independently. One solution is to divide training into two categories:

- **Technology-permitted tasks**, where MT use is encouraged, such as post-editing for translation and simultaneous post-editing for interpreting, and analysing source texts rich in implicature to develop critical evaluation of MT output.

- **Technology-free tasks**, where software tools monitor and verify that students' translations are free from MT influence.

The aim is not to eliminate MT or other translation technologies from education, but to promote a balanced co-development of human and machine capabilities. Future research will focus on how to best achieve this balance in both online and offline translator and interpreter training

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Authors' profiles

Leonid Chernovaty, DrSc, Professor;

Mykola Lukash Translation Studies Dept, V. N. Karazin Kharkiv National University (Ukraine);

Department of English and American Studies, Matej Bel University (Slovakia);

Full Member of Higher School Academy of Sciences of Ukraine;
President, Ukrainian Translator Trainers' Union (UTTU).

E-mail: leonid.m.chernovaty@meta.ua

http://orcid.org/0000-0003-3411-9408

Natalia Kovalchuk, PhD, Associate Professor;

Mykola Lukash Translation Studies Dept, V. N. Karazin Kharkiv National University (Ukraine).

Department of English and American Studies, Matej Bel University (Slovakia).

E-mail: kovalnatalya@bigmir.net

http://orcid.org/0000-0002-9483-4297

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Authors: Leonid Chernovaty, Natalia Kovalchuk

Reviewers:
Prof. Olena Panchenko, DrSc (Oles Honchar Dnipro National University)
Prof. Kateryna Skyba, DrSc (Khmelnytskyi National University)

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