**Oksana Ivanova**

RHETORIC AS A FRAMEWORK FOR TRANSLATION COMPETENCE DEVELOPMENT: SPECIALISED TRANSLATION PROCESS RESEARCH

Summary of the Doctoral Thesis

RIGA TECHNICAL UNIVERSITY

Faculty of Computer Science, Information Technology and Energy

RTU LIEPĀJA ACADEMY

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"E-learning Technologies and Management"

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DECLARATION OF ACADEMIC INTEGRITY

I hereby declare that the Doctoral Thesis submitted for review to Riga Technical University for promotion to the scientific degree of Doctor of Science (Ph. D.) is my own. I confirm that this Doctoral Thesis has not been submitted to any other university for promotion to a scientific degree.

Oksana Ivanova……………………………. (signature)
Date: ………………………

The Doctoral Thesis has been written in English. It consists of an introduction, four chapters, research conclusions, bibliography containing 374 entries, and 14 appendices. The research has been illustrated with 34 figures and 14 tables. The volume of the Doctoral Thesis is 208 pages, not including appendices.

ACKNOWLEDGEMENTS

Glossary of Terms and Abbreviations

Digital rhetoric – the field of study concerned with the conventions of new digital genres and their rhetorical interpretation.

EMT – European Master's in Translation, i.e., a partnership project between the Directorate-General for Translation of the European Commission and higher education institutions from European and non-European countries; it is also referred to as a quality label for master study programmes in translation.

MT – machine translation, i.e., the use of artificial intelligence to automatically translate a text from one language to another without human involvement.

PACTE – the research group "Process in the Acquisition of Translation Competence and Evaluation". It uses experimental research methods to investigate translation competence and how it is acquired.

Rhetoric – the study of principles and rules of composition, information organisation, rhetorical strategies and devices to achieve efficient communication.

SL – source language, i.e., the language to be translated into another language.

Specialised translation – a term that is applied in the education environment and the translation industry. Text to be translated is specialized if translating it requires field specific knowledge of a translator or translation student. Synonyms to the term "specialised translation" are technical translation, pragmatic translation or LSP (Language for Special Purposes) translation.

ST – source text that is the original text that is to be translated into another language.

TL – target language, i.e., the language into which a text written in another language is to be translated.

TT – target text that is the translated text or the text that the translator produces from the source text.

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1. GENERAL DESCRIPTION OF THE RESEARCH

1.2. Topicality of the Research

In the contemporary globalised era, mediation between cultures is becoming increasingly important, and according to a new interpretation of translation thinking and practice that engage with the challenges of human-induced environmental change, translators have to find the most appropriate association for the local and the global through specific cultural experiences (Cronin, 2017). To achieve the goal of transforming education to transform the world, mediation between cultures should be viewed as an environmental context, which goes beyond the source and target texts and the cognitive processes involved in the process of translation (UNESCO, 2018). Translation is one of the types of "work in progress" (Stolze 2011: 194), and, as a result, translation is an open-ended and life-long process.

From antiquity to the present day, rhetoric has always been closely associated with teaching and translation. In the present research, rhetorical pedagogy is treated as a paradigm, a set of basic principles that can be applied in various ways to achieve learning outcomes. It is based on experience and reality, meaningfulness, transdisciplinary inquiry, collaboration, and sustainability. It is built upon an assumption that careful observation and analysis are necessary for successful communication (cf. Garver, 1994). Rhetoric is important in helping to reveal the different ways people reason from one position to another, and as a result, has the capacity to develop the ability to make informed and rational decisions with regard to various social, political, and ethical matters. Rhetorical pedagogy makes an attempt "to shape a certain kind of character capable of using language effectively […]. Its dual purposes are the cultivation of the individual and the success of a culture" (Beale, 1990: 626). The demands of contemporary teaching and learning can benefit from the analysis of pedagogy and translation, starting from the works of ancient Greek and Roman rhetoricians.

The present research proposes an approach to teaching specialised translation whereby students develop transversal skills (i.e. transferable in different life situations) through the application of classical and digital rhetoric. Not only is rhetoric relevant, but it is also crucial to both formulating and evaluating thoughts and behaviours. There is an expanding body of research seeking to develop a deeper understanding of how our social nature is rhetorically manufactured, and this has grown into an influential facet of interdisciplinary scholarship. For the contemporary translator affected by digitalisation, the development of artificial intelligence, and smart automation, the rhetorical model is used in the research as a description of the

emerging skill sets. Rhetoric involves not only learning and implementing new tools and techniques; it also involves making information explicit and then utilizing it in an intentional manner. Professor of Rhetoric Michael Burke (2013) promotes Cicero's notion that rhetoric has a trilateral function: to persuade, to please and to teach. Translation should be examined through the prism of rhetoric as a process of meaning creation rather than as a search for norms and standards or nonconformities and deviations in translation.

The present research is based on the philosophical, psychological and methodological frameworks. The philosophical framework is also used to analyse the new paradigms in society brought up by the industrial sector and educational reforms. The new age of education is also increasingly affected by media, the Internet and digital technologies. Innovations in various disciplines have led to changes in teaching approaches, learning styles, cultural aspect perception and forms of education. The new-age technologies have brought about fast-paced changes, leading to a paradigm shift in education, in general, and the skill set required in translation, in particular.

Translation has become a significant area of research, producing a major effect on the development of humanity since its history of at least two millennia long to the present day. Translation studies is experiencing new advances and challenges posed by the digital world, seeking new solutions in order to adapt to particular market requirements, thus contributing to the innovation in the field. Information technology has brought about the theory of connectivism, computer-based learning, networked learning and e-learning. Artificial intelligence has introduced the pattern recognition theory of mind that can be used to understand the process of cognition, learning, and knowledge acquisition. Cognitive science has proposed the cognitive load theory, which plays a role in knowledge creation and management. Accepting global trends, adopting emerging solutions and evolving in a new form through artificial intelligence, the translation industry has significantly grown and developed over the past two decades. Translator training as a resource-based learning activity requires new strategies and methods with regard to relevant information extraction, retrieval, processing and creation of new knowledge. To achieve academic and scientific excellence, the students majoring in specialised translation should be engaged in the multi-dimensional context of life-long learning.

In translator training, it is also evident now that the contemporary set of competences will not be the same in the future as the role of the translator changes. If forecasts come true and machine translation output becomes more accurate, the translator's task may be shifted to pre-editing, post-editing, quality control and quality assurance in the future. But at present, despite translation technology is becoming an essential part of a translation trainee's learning

process, traditional linguistic skills greatly influence the training process because translation is "an intelligent activity, requiring creative problem-solving in novel textual, social, and cultural conditions" (Robinson, 2003:35). One of the conclusions reached at the European Union Translating Europe Forum "New Skills, New Markets, New Profiles" is that translations that require tailor-made creative skills will need translators whose linguistic creativity is favoured over technological skills (cf. Translating Europe Forum, 2017). Therefore, instructors should focus not only on digital rhetoric but also on developing traditional rhetorical competence that involves imagination and creativity.

To keep pace with fast-evolving interactions in multilingual and multicultural settings and increasingly sophisticated socio-cultural, economic and political interrelations resulting from globalisation, a need arises to re-evaluate and reconstruct the translation training process in order to respond to the global trends and drivers. This raises the questions of *what* should be taught in the translation classroom, *how* to successfully combine translation theory with practice and *how* to pedagogically develop students' translation competence. Rethinking translation pedagogy for the 21st century skills is important for determining new competences that contemporary students need to acquire and develop.

UNESCO's initiative "Futures of Education" aims at rethinking education in a world of increasing complexity. European Union Translating Europe Forum 2022, in its turn, focused on human–technology interrelation and showed how technology, the specialist skills and competences had made the world more interconnected, accessible and friendly. It was stated and confirmed by the participants of the forum representing academia, industry, and practitioners that humans with their irreplaceable creativity would remain the centre-stage. Translator training, in this context, should be adapted to the new advances and challenges. The issues resulting from the global environment have brought transdisciplinarity to the foreground within the context of educational reforms (cf. Klein, 2015). Transdisciplinarity can provide an opportunity for a new way of thinking and acting. The transdisciplinary approach proposes new ways not only of organising, but also of thinking about knowledge and inquiry in a world that has become too large to be known, perceived and understood (cf. Salite et al., 2016).

According to the National Development Plan of Latvia for 2021–2027, European and Latvian development requires significant investments in the creation of an efficient, innovative knowledge economy, improvement of education at all levels, quality and lifelong learning for all and the development of a knowledgeable and creative society. Knowledge acquisition and transfer, creativity, digital skills and technological competence have become crucial for further development of the country. In Latvia, the science of pedagogy explores inner dynamic relations

created among the instructor, student and the study content in "social, deliberately organised integrative settings" where instructor–student communication contributes to students' autonomy. Reflection and self-evaluation practice of instructors and students contribute to the educative value of the process (cf. Žogla, 2018: 36).

The need for translation theory in teaching was acknowledged by scholars who maintained that applying the translation theory would develop students' translation competence (Bell, 1991; Shäffner and Adab, 2000; Lederer, 2007), expand the horizons for analysing the social, cultural and historic dimensions of the source text (Snell-Hornby, 1992; Chesterman, 2007), as well as reflect on the mental processes occurring while translating (Kiraly, 1995; Tymoczko, 2007). For a long time, the focus on the necessary skills and knowledge of translators did not keep pace with theoretical considerations on how to resolve translation challenges at the word, sentence and text levels. Change in the attitude towards translation practice emerged with focus on translation as situated practice, i.e., practice that is dependent not only on translator's knowledge and skills, but also on the relationship and collaboration of stakeholders involved in the translation process, digital tools and technologies, as well as material, social and cognitive factors that appear during the creation of the target text (Risku, 2002). These insights demonstrate that the theory of translation pedagogy has become increasingly important in translator training.

The OECD Learning Compass 2030 has identified three "transformative competencies" that students will need in the future. These have been identified as *creating new value, reconciling tensions and dilemmas,* and *taking responsibility* (cf. OECD, 2019). Students need support in developing not only competences but also attitudes and values that can guide them towards ethical and responsible actions (cf. Education Development Guidelines of Latvia for 2021–2027). Contemporary events expand the field of learning, and they have the potential of deepening learning in order to transfer experience to another situation. The development of a broader framework will be based on the author's pedagogical and research experience, focusing on the choice of pedagogical approaches and methods.

The above-mentioned tendencies in higher education and requirements for the future competences of translator define and substantiate **the following research frameworks.**

1. **The evolving competence framework**. Education is not considered any more as a sole process of knowledge transfer but the process that involves (re)creation, creativity, experimentation, critical awareness and reflection. Competence development involves in-depth learning, i.e., the process by which students develop the ability to generalise and reason, transfer new knowledge and skills to unknown situations, focusing on the processes of knowledge

acquisition (cf. Pavitola & Latsone, 2021). One of the most important areas in translation studies today is the research of teaching and learning methods in order to develop the theoretical and practical framework for future translator training. For this reason, the notion of translation competence plays an important role and requires an in-depth investigation.

2. **Transdisciplinary framework**. Translation studies has initially been interrelated with philosophy, rhetoric, linguistics, literature, pedagogy and cultural studies, thus revealing interdisciplinary aspects of the discipline. However, with the advent of new technologies, in the 21st century it has acquired a transdisciplinary status as its scope of research has been expanded to cognitive science, neurolinguistics, computational linguistics, psycholinguistics, artificial intelligence, etc. Therefore, in the current situation and with the future perspective in mind, translator training should be implemented taking into account the developing technological trends and increasing skills requirements.

3. **Creativity framework**. Creativity as an important component of the new educational paradigm is multifaceted. Creativity in its various manifestations is related to the unexpected and remarkable, triggering new modes of thinking in the education context, thus establishing innovative, distinct and dynamic environments. These environments facilitate the generation of ideas, the creation of products, and diverse interactions among individuals (cf. Medveckis et al., 2021). To develop students' independence, freedom and responsibility in the study process, instructors should adopt a creative approach that focuses on the student as part of the professional community, involving the dimensions of knowledge, performance and identity formation (cf. Špona, 2022). The evolution of education system should be systemic and consistent; therefore, educators, researchers and policymakers are expected to make changes in the theory and practice of teaching and learning in order to ensure high-quality training of students.

The research has been conducted at a time characterised by a changing paradigm in education that needs to meet the expectations and different learning traditions of a new generation of students, incorporate emerging technologies in the learning process, develop sustainable teaching strategies, as well as comply with the industry requirements. Various perspectives on translation pedagogy demonstrate a diversity of teaching approaches, methods and solutions, which illustrate that translation is a constantly developing phenomenon with various stages of development resulting from the adoption and implementation of certain ideologies, policies and practices in a particular period of time. New trends in the field of higher education, contemporary requirements for a professional translator, and the constantly changing and developing methodological system for translator training have made the present research relevant and topical.

1.2. Aim and Tasks of the Research

The aim of the research: To investigate the process of developing students' translation competence and to use the results obtained in order to improve the study process in terms of increasing students' translation performance and the quality of translations produced, as well as to develop the rhetorical model of specialised translation teaching, taking into account the specifics of translation tasks and the emerging skills set.

The research questions
1. What are the rhetorical, philosophical, cultural, linguistic and technological aspects related to the field of translation?
2. Which pedagogical principles should be incorporated into the specialised translation teaching process in order to promote the development of students' translation competence?
3. What is the theoretical substantiation for the development and application of the rhetorical model in the specialised translation teaching process?
4. How does the rhetorical model of specialised translation teaching affect students' performance and translation competence development?

To achieve the aim of the research, the **following tasks have been set**:

1) to review and examine trends in translation development, translation theories and teaching practices;

2) to develop the rhetorical model of specialised translation teaching;

3) to research the students' translation process, determining the effect of the rhetorical model on students' performance and translation competence development;

4) to propose sample tasks in order to develop students' textual analysis skills, to enhance intercultural competence, as well as strengthen responsible decision-making skills;

5) based on the theoretical and empirical research, to draw conclusions and propose recommendations for the implementation of the rhetorical model of specialised translation teaching in the pedagogical practice.

The object of research: The pedagogical process in the specialised translation learning environment.

The subject of research: The interaction of rhetoric and translation for the creation of an improved specialised translation learning environment.

The research base: The research base consists of the students of the professional Bachelor study programme "Technical Translation" at the Faculty of Computer Science, Information Technology and Energy (before the consolidation process (until 31 December 2023) the Faculty of E-learning Technologies and Humanities) of Riga Technical University.

1.3. Theoretical Significance and Scientific Novelty of the Research

1. The present research is the first attempt to develop an integrated framework for specialised translation teaching investigating rhetorical pedagogy that encompasses all the factors that affect meaning representation, encoding and decoding necessary for a new target text creation, taking into account the whole system of translation. The proposed framework emphasises the application of different theories and tools that support transdisciplinary inquiry, collaboration and sustainability, as well as the interconnection of experience and reality.

2. Having examined the development of translation studies through the exploration of essential historical interactions with other disciplines, an integrated view of translation studies has been presented demonstrating the rhetorical, philosophical, cultural, linguistic and technological aspects related to the field of translation.

3. The structure and characteristic features of the specialised text have been determined to reveal the specifics of specialised translation teaching. Based on the authentic specialised texts in different domains of knowledge, sample tasks have been proposed in order to develop students' linguistic and cultural competence, textual analysis skills, creativity and critical thinking skills, as well as strengthen responsible decision-making skills.

4. Special sample tasks have been proposed for digital text analysis, emphasising the accepted practices, norms, methods and structure of both textual and non-textual information, considering the role of visual mode in written communication, the concept of news value system, as well as assessing the information quality of digital texts. The tasks aim at engaging students in the interpretation and creation of meaning in the digital environment, thus promoting the development of students' multiple competences, such as textual, visual, and digital literacy.

5. The principles of teaching specialised text translation have been distinguished: the integration of knowledge, co-construction of knowledge, the use of appropriate digital tools to fulfil translation tasks, collaboration, active peer-to-peer online interaction, use of reflection in

action (critical thinking and self-assessment), and engagement with real-life professional translation environment.

6. Based on the examination of different approaches applied to translation teaching, the rhetorical model of specialised translation teaching has been developed that aims at engaging cognitive dimensions of learning and enhancing students' ability to discover and maximise their unique strengths. In compliance with recent UNESCO research concerning the necessity to promote students' ability to comprehend, interpret and communicate knowledge, the developed rhetorical model of specialised translation teaching encourages students to understand, interpret and apply knowledge and skills in various situations.

1.4. Practical Significance of the Research

1. The results of the research with regard to meaning representation, encoding and decoding necessary for a new target text creation can be used in the courses on rhetoric, stylistics, scientific writing and editing, cultural studies as well as digital rhetoric.

2. The stages of organising translator training and the activities proposed can be recommended for application within specialised translation courses.

3. The results of the research concerning translator training may be used as a foundation for the implementation of specialised translation teaching in the e-learning environment.

1.5. Thesis Statements to be Defended

1. The developed rhetorical model of specialised translation teaching describes the translation process that is based on the critical analysis of the source text and the creation of the target text according to the accepted linguistic and textual norms of the target culture. The rhetorical model offers six stages of action from the identification of the source text features to the creation of a harmonised target text: Identifying – Understanding – Producing – Comparing – Evaluating – Harmonising. The analysis of the students' translation process enables the instructor to obtain timely information on the development of students' knowledge and skills in the learning process, assess their progress according to the Dunning-Kruger model, and determine the expected learning outcomes upon the completion of the study course.

2. A metric for the quantitative characterisation of the translation process has been developed, which complements the traditional metric for the evaluation of translation output by using the time interval capabilities of e-learning technologies. The research on translation

competence development and the obtained data on the dynamics of students' learning process confirm the Dunning-Kruger model and its applicability in the educational process of translators.

1.6. Approbation of Research Results

The results of the Doctoral Thesis have been presented in 23 international scientific conferences. The developed rhetorical method has been applied during lectures, practical classes and seminars within the study courses "Translation of Texts in Special Area", "Professional Translation Practice", "Research Writing", "Stylistics and Editing", "Computer-Assisted Translation Tools", and "Machine Translation" of the professional Bachelor study programme "Technical Translation" implemented by the Institute of Digital Humanities of the Faculty of Computer Science, Information Technology and Energy (before the consolidation process (until 31 December 2023) the Institute of Applied Linguistics of the Faculty of E-learning Technologies and Humanities) of Riga Technical University.

The results obtained within the framework of the Doctoral Thesis have been approbated:

- **in academic work**
    - delivering such study courses as "Professional Translation Practice", "Computer Assisted Translation Tools", "Translation of Specialisation Texts", and "Stylistics and Editing" to the students of the professional Bachelor study programme "Technical Translation";
    - developing new study courses, such as "Digital Editing" and "Computer Assisted Translation Tools";

- **in professional development activities**
    - undertaking Erasmus+ staff training mobility to Alkala University, Spain, 11–15 March 2019 (Faculty of Philosophy and Arts, Department of Modern Philology, Master study programme "Intercultural Communication and Public Service Interpreting and Translation");
    - participating in the Doctoral School "FuturICT 2.0 Hackathon: Educational Data Challenge" (11–13 January 2019) organised by Distance Education Study Centre of Riga Technical University (1st place. Team "Eagle Eye". Members:

Iveta Daugule, Edgars Zagorskis, Loreta Juškaite, Oksana Ivanova, Zane Seņko).

With regard to the **research area of the Doctoral Thesis**, the author has developed the **following publications.**

1. Salīte, I., Fjodorova, I., Butlere, I., Ivanova, O. (2021). More Personal Knowledge for More Sustainable Higher Education. *Journal of Teacher Education for Sustainability, 23* (1), 2021, 150–165. doi: 10.2478/jtes-2021-0011. (Scopus indexed).

2. Iļinska, L., Ivanova, O. (2020). Creation and Extension of Meaning in Professional Communication. *Research in Language*, *18* (3), 283–297. ISSN 1731-7533. doi:10.18778/1731-7533.18.3.03. (Scopus indexed).

3. Iļinska, L., Ivanova, O. (2020). Some Aspects of Colour Concept Application in Architecture. *Language – 2020: Language in Various Cultural Contexts*. Daugavpils: DU "Saule", 193–199. ISBN 978-9984-14-920-2. (EBSCO indexed).

4. Iļinska, L., Ivanova, O. (2020). Developing Textual Competence in the Digital Age. *The Word: Aspects of Research, 24* (1/2), 302–313. Liepaja: LiePA. ISSN 1407-4737. (EBSCO indexed).

5. Iļinska, L., Ivanova, O., Smirnova, T. (2019). Relevance-Based Approach to Translation of Contemporary Popular Science Texts. *Vertimo studijos, 12*, 36–50. ISSN 2029-7033. doi:10.15388/VertStud.2019.3. (ERIH indexed).

6. Ivanova, O. (2019). Characteristics of LSP Text: Metaphoric Meaning Extension. *Language – 2019: Language in Various Cultural Contexts*. Daugavpils: DU "Saule", 138–143. ISBN 978-9984-14-892-2. (EBSCO indexed).

7. Iļinska, L., Ivanova, O. (2019). Pragmatic Adaptation within Cognitive Approach to Translation of Popular Science Texts. *The Word: Aspects of Research,* 23 (1/2), 322–330. Liepaja: LiePA. ISSN 1407-4737. (EBSCO indexed).

8. Ivanova, O. (2019). LSP Text Translation Teaching: Communicative Competence. *The Word: Aspects of Research, 23* (1/2). Liepaja: LiePA, 331–340. ISSN 1407-4737. (EBSCO indexed).

9. Iļinska, L., Ivanova, O. (2018). Target Text as a Different Context: Cultural Adaptation. *Language – 2018: Language in Various Cultural Contexts.* Daugavpils: DU "Saule", 62–67. ISBN 978-9984-14-861-8. (EBSCO indexed).

10. Iļinska, L., Ivanova, O. (2017). Challenges in Contemporary LSP Text Translation. *Language – 2017: Language in Various Cultural Contexts.* Daugavpils: DU "Saule", 9–14. ISSN 1691-6042. (EBSCO indexed*).*

11. Iļinska, L., Ivanova, O. (2017). ICT Competence in Second Language Acquisition. *ICT for Language Learning, 10th edition* (pp. 174–179). 9–10 November 2017, Italy, Florence. Padova: Libreriauniversitaria.it edizioni, 2017. ISBN 978-88-6292-660-7.

12. Iļinska, L., Ivanova, O., Senko, Z. (2016). Rhetoric of Scientific Text Translation. *Procedia – Social and Behavioral Sciences, 231, 84–91.* doi.org/10.1016/j.sbspro.2016.09.075. (WoS indexed).

13. Ivanova, O. (2016). Translation and ICT Competence in the Globalized World. *Procedia – Social and Behavioral Sciences, 231,* 129–134*.* doi:10.1016/j.sbspro.2016.09.081. (WoS indexed).

14. Iļinska, L., Ivanova, O., Seņko, Z. (2016). Mosaic of Multimodal Texts. *Language – 2016: Language in Various Cultural Contexts*. Daugavpils: DU "Saule", 164–169. ISBN 978-9984-14-788-8. (EBSCO indexed).

15. Iļinska, L., Ivanova, O., Seņko, Z. (2016). Rhetoric of science: Strategic use of language. In: *The 20th European Symposium on Languages for Special Purposes "Multilingualism in Specialized Communication: Challenges and Opportunities in the Digital Age"*, (pp. 48–55). 8–10 July 2015, Vienna, Austria, University of Vienna, Centre for Translation Studies, ISBN 978-3-200-04739-6.

16. Iļinska, L., Platonova, M., Smirnova, T., Ivanova, O., Seņko, Z. (2016). Lingvistiskais un ekstralingvistiskais konteksts tulkošanā. *The Word: Aspects of Research, 20 (2), 68–77.* Liepaja: LiePa. ISSN 1407-4737.

17. Iļinska, L., Ivanova, O., Seņko, Z. (2016). Tulkošanas izaicinājumi ekonomikas nozares tekstos. In: *Terminrade Latvijā: senāk un tagad: Latvijas Zinātņu akadēmijas Terminoloģijas komisijas 70 gadu jubilejas konference* (pp. 58–64). 11 November 2016, Riga: Terminology Commission of the Latvian Academy of Sciences, ISBN 978-9934-549-25-0.

18. Iļinska, L., Ivanova, O. (2016). Challenges in Contemporary LSP Text Translation. In the 8th EST Congress: *Translation Studies: Moving Boundaries*, (pp. 115–116). 15–17 September 2016, Aarhus, Denmark.

The following reports have been delivered in international scientific conferences.

1. Specialised Translation Process Research. *64th International Scientific Conference of Riga Technical University*. Riga, 16 October 2023.

2. Multidisciplinarity in Translator Training: Critical Discourse Analysis. *International Scientific Conference "Translation, Ideology, Ethics: Response and Credibility",* Vilnius, 23 September 2022.

3. Multidisciplinary Approach to Textual Analysis in Translation Classroom. *International Scientific Conference "Meaning in Translation: Allusion of Precision",* Riga, 24 May 2022.

4. Language for Science and Technology: Metaphoric Meaning Extension. *Language-2019: Language in Various Cultural Contexts*. Daugavpils, 24–25 January 2019.

5. Developing Textual Competence in the Digital Age. *International Scientific Conference "The Word: Aspects of Research"*, Liepaja, 28–29 November 2019.

6. Translation around the Globe: Metaphoric Competence. *International Scientific Conference "Bridging Languages and Cultures",* Ventspils, 12–13 September 2019.

7. ESP Teaching: Communicative Competence. *International Scientific Conference "The Word: Aspects of Research"*, Liepaja, 29–30 November 2018.

8. Developing ICT Competence in Research Writing. *International Scientific Conference "3rd Languages in the Globalised World"*, Leeds, 23–24 May 2018.

9. Decoding of Meaning in Professional Communication. *International Scientific Conference* "Meaning in Translation: Illusion of Precision", Riga, 16–19 May 2018.

10. Target Text as a Different Context. *Language-2018*: *Language in Various Cultural Contexts*. Daugavpils, 25–26 January 2018.

11. ICT Competence in Second Language Acquisition. *International Scientific Conference "ICT for Language Learning",* Florence, Italy, 9–10 November 2017.

12. Pedagoģiskās pieejas piesātinātā, padziļinātā un pārnesamā mācību procesā. *58th International Scientific Conference of Riga Technical University*, Riga, Latvia, 16 October 2017.

13. Contemporary LSP Text Translation: Creative Process and Imaginative Practice. *International Scientific Conference "Translation: Sameness, Likeness and Match", Vilnius, Lithuania, 5–6 October 2017.*

14. Lexical Innovation as Manifestation of Linguistic Creativity. *International Scientific Conference "iMean 5*", Bristol, UK, 6–8 April 2017.

15. Challenges in Contemporary Scientific Text Translation. *Language-2017: Language in Various Cultural Contexts*. Daugavpils, 26–27 January 2017.

16. Tulkotāju apmācība: izaicinājumi un risinājumi. *2.ziemas lasījumi "Tulkotāja meklējumi un atradumi"*, Riga, 9 December 2016.

17. Profesionālo terminu dekodēšana: nozīmes izvēle. *International Scientific Conference "The Word: Aspects of Research"*, Liepaja, 1–2 December 2016.

18. Tulkošanas izaicinājumi ekonomikas nozares tekstos. *The 70th anniversary conference of the Terminology Commission of the Latvian Academy of Sciences "Terminrade Latvijā: senāk un tagad".* Riga: Terminology Commission of the Latvian Academy of Sciences, 11 November 2016.

19. Challenges in Translation of Technical Texts. *8th EST Congress "Translation Studies: Moving Boundaries"*, Aarhus, Denmark, 14–17 September 2016.

20. Main Reasons that Change the Contemporary LSP Text. *Meaning in Translation: Illusion of Precision.* Riga, 11–13 May 2016.

21. Multimodal LSP Text. *Language-2015: Language in Various Cultural Contexts.* Daugavpils, 28–29 January 2016.

22. Traditional vs. New Approaches to Term Alignment in English and Latvian. *International Scientific Conference "The Word: Aspects of Research",* Liepaja, 3–4 December 2015.

23. Rhetorical Strategies in the Contemporary Professional Text. *The 20th European Symposium on Languages for Special Purposes* "*Multilingualism in Specialized Communication: Challenges and Opportunities in the Digital Age*, Vienna, Austria 8–10 July 2015.

1.7. Content and Volume of the Doctoral Thesis

The Doctoral Thesis consists of an introduction, four chapters, research conclusions, bibliography and appendices.

The introduction of the Doctoral Thesis substantiates the topicality of the research, states the research subject and object, presents the research questions, puts forward the aim and tasks, identifies research methods, as well as presents scientific novelty and the theoretical and practical significance of the research.

Chapter 1, "The Rhetoric of Translation", focuses on the main trends in the history of translation, providing an overview of the key concepts and theories of translation from Classical Antiquity to the present day with an emphasis on the emergence of the discipline of Translation Studies. It starts with the investigation of deep historical roots with rhetoric in order to identify rhetorical theories and apply them in translation practice for the critical analysis of texts to be translated, as well as for meaning decoding and representation in the translated texts. The transdisciplinary nature of translation studies is demonstrated in the chapter through an

examination of its close interaction and relationship with philosophy, cultural studies, linguistics, and artificial intelligence. The current state and prospective advances in translation studies are also considered in order to determine which skills translators will need in the future, which will be taken into account in the specialised translation teaching process.

Chapter 2, "Translation Pedagogy as Applied in Real Educational Contexts", provides an overview of the fundamental contributions to translation teaching. The chapter demonstrates that in order to respond to the global trends and drivers, there is a necessity to re-evaluate and reconstruct the translation training process. Students need support in developing not only translation skills and competences but also attitudes and values that can help them respond to different situations. The chapter reviews various approaches to translation teaching, such as *product-oriented approach, process-oriented approach, task-based approach, corpus-based approach, telecollaborative approach, emergentist approach,* and *ecological approach*, thus forming the theoretical foundation for the present research. The insight into translator training from different perspectives reveals the main principles that should be taken into account in a specialised translation classroom.

Chapter 3, "Teaching Specialised Translation in the New Media Age", discusses translation competence as a complex learning outcome to be achieved, introduces to the nature of specialised translation, and proposes the rhetorical model for meaning decoding and encoding in specialised translation teaching. Translation competence models are explored in line with the OECD Future of Education and Skills 2030. Specialised translation teaching is examined through the tenets of the rhetoric of science, the characteristics of specialised texts, and the sample tasks designed based on authentic texts in various fields. Special tasks have also been proposed for digital text analysis, emphasising the accepted practices, norms, and structure of both textual and non-textual information, considering the changes in the use of classical rhetorical canons in the digital space, as well as assessing the information quality of digital texts. Based on the investigation of the rhetoric of science, the characteristic features of the specialised text, digital rhetoric and digital texts, the rhetorical model has been proposed in specialised translation teaching.

Chapter 4, "Empirical Research Methodology: Approbation of the Rhetorical Model of Specialised Translation Teaching", presents the methodological approach of the present research. The author introduces the data collection methods and characterises different types of data obtained within the research. The chapter analyses the results of the students' translation performance and the development of translation competence. Examples are provided in the chapter to demonstrate how the data have been approached and used in the framework of the research.

2. OVERVIEW OF THE RESEARCH

2.1. The Rhetoric of Translation

The first chapter of the Doctoral Thesis examines the development of translation studies through the exploration of essential historical interactions with other disciplines. The chapter addresses the first research question: *What are the rhetorical, philosophical, cultural, linguistic and technological aspects related to the field of translation?* It investigates deep historical roots with rhetoric in order to identify rhetorical theories and apply them in translation practice.

From antiquity to the 21st century, theoretical statements about translation fell into traditionally defined areas of thinking about language and culture, rhetoric, pedagogy and philosophy. Within the practice of rhetoric, translation was considered a tool of language teaching and learning. As part of rhetorical training, translation methods were used to develop students' understanding of their native language. Making *use of rhetorical principles*, five different imitative methods were proposed for learning: (1) translation; (2) paraphrase; (3) metaphrase; (4) epitome, i.e., the extraction of the main idea; (5) amplification, i.e., active implementation of adaptation.

Rhetoric had an enormous influence in the history of human knowledge development, including reading, writing, translation and pedagogy, and, therefore, encompassed diverse definitions. Rhetoric can be seen as "a universal phenomenon, a universal facet of human experience" (Jasper, 1993: 16). In "The Rhetorical Tradition: Readings from Classical Times to the Present" (2000), Patricia Bizzell and Bruce Herzberg present numerous definitions of rhetoric, such as *the study of strategies of effective oratory; the use of language (written or spoken); the study of the persuasive effects of language; the study of the relation between language and knowledge; the classification and use of rhetorical devices and strategies.* Among all the possible definitions of rhetoric, the one made by James J. Murphy (1987), who called rhetoric "the art of future discourse", is the most important as it may describe both translation practices and pedagogies in the history of rhetoric. This definition is one that most relates to the present research taking into consideration the necessity of reimagining and reconceptualising the concept due to the development of digital rhetoric.

In an attempt to treat the rhetoric of translation in relation to teaching and learning, translation involves such categories as the rhetoric of accuracy, violence, faithfulness, and, in general, communication. The main concepts of rhetoric, such as *ethos*, *logos, pathos* and *kairos*,

are highly applicable to translation. For example, the notion of the "translator's invisibility" coined by Lawrence Venuti in the 1990s, is primarily the study of ethos. The need in historically and culturally grounded studies of rhetoric and translation was substantiated by Hadley & McElduff (2017) who studied the intersections between rhetoric, oratory and a range of translation practices and theories. Examining translation from the perspective of rhetoric can provide a bridge between practice-oriented approaches and highly theorised approaches, which tend to view translation within other domains of knowledge, such as cognitive linguistics, literary studies, and pedagogy.

Within rhetorical pedagogy, *requirements* for the translator were proposed: translator should have a thorough *knowledge of both the source and target languages* in order to produce a good translation, as well as a translator should be well educated in the *field of knowledge chosen for translation.* First translation *guidelines* were also formulated: (1) understanding of the sense and matter of the text to be translated; (2) avoiding word-for-word translation and the use of neologisms; (3) applying rhetorical strategies and devices to make translation sound natural, fluent and appealing.

Translation was approached as *a creative force*, in which translation strategies served a variety of cultural and social functions, paving the way for the construction of nations, literatures and languages. It was recognised that the translated text should be aesthetically oriented, bringing *beauty in sense and in meaning*. Translators, therefore, strived for elegance in translation through the application of *rhetorical strategies and devices, as well as the creation of images.*

Translation status changed only in the 20th century, when translation studies developed into an independent discipline. Since the 1940s, each decade has generated a new wave of concepts and theories contributing to translation studies, such as autonomy, translatability, equivalence, Skopos theory, cultural turn, post-colonial translation theory, relevance theory, corpus translatology, etc. The range of theories applied to the study of translation demonstrates its complex nature and the resulting fragmentation into empirical research, hermeneutic and literary studies, as well as linguistics and cultural studies. As the discipline moved towards the present state, the level of its sophistication and relation to various domains of science produced new theories, approaches and methods. The "technological turn" has led to translation research into machine translation, computer-assisted translation, localisation, crowd-sourcing, pre-editing and post-editing.

An *integrated view of translation studies* is presented in Fig. 2.1 that demonstrates how rhetorical traditions, philosophy, cultural studies, linguistics and advances in technology have contributed to the development of translation studies as a discipline.
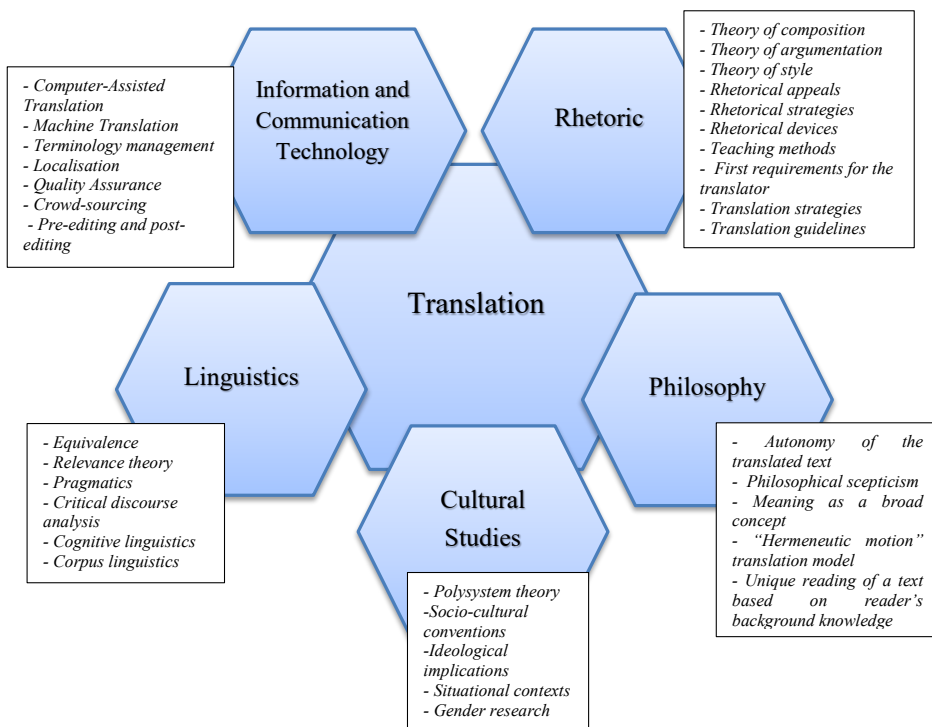
Fig. 2.1. Contributions of other disciplines to the development of translation studies. (Developed by the author based on the literature review)

Future advances in translation studies suggest paying special attention to the translation environment comprising the internal and external factors influencing the learning process. The task of instructors is to direct the students along a path of *meaningful reasoning, logical argumentation and creative thinking,* as well as support their *desire to study, learn new skills and reach new horizons*. In the translation classroom, it is necessary to develop new perspectives from the application of translation theory and rhetorical pedagogy. The acquisition of digital skills relevant for translators is also compulsory for the digital analysis of source and target texts and the application of computer-assisted and machine translation tools.

Translation studies has evolved into a field that adopts approaches from a variety of disciplines, adjusts them and elaborates new theories and models. Owing to its rich history, translation studies is now experiencing the overlapping and crossing of borders, relying on the previous disciplines and moving towards new areas based on technological developments.

2.2. Translation Pedagogy as Applied in Real Educational Contexts

The second chapter of the Doctoral Thesis offers contextual background to the field of translation teaching. It begins by identifying a pedagogical gap in translation teaching and then presents different approaches to translation teaching.

Translation scholars have started to address many new issues raised in translation pedagogy as a result of the world of fast-paced changes and modernisation. One major concern is the process of translation teaching taking into account technological advancements and the changing role of translators. There is a lot of debate among scholars about the relationship between translation theory and practice since the discipline has been established. For a long time, the focus on the necessary skills and knowledge of translators did not keep pace with theoretical considerations on how to resolve translation challenges at the word, sentence and text levels. According to Hanna Risku (2002), a change in attitude towards translation practice appeared in the 1980s with what the scholar considered the milestones of 'situated translation', including Skopos theory and theory of translational action.

Recognising the need for translation pedagogy, Holmes (1988 reprinted from the 1972 original paper) proposed an overall framework for Translation Studies, being classified into "pure" (subdivided into "descriptive" and "theoretical" studies) and "applied" areas (the application of translation in other fields and disciplines). Descriptive Translation Studies is categorised into product-oriented, function-oriented and process-oriented, while Theoretical Translation Studies is either "general" or "partial". Partial theories are restricted by medium, area, rank, text type, time, etc. Applied Translation Studies is of importance for the present research and covers translator training, translation textbooks and other tools and materials, as well as translation criticism.

2.2.1. An Overview of Approaches to Translation Teaching

In the *product-oriented approach*, translation focuses on an error analysis that is performed in three steps: identifying errors, explaining their cause and correcting them (pedagogical assistance). First of all, all the mistakes made in the translation are classified into primarily linguistic categories, and then all the mistakes are evaluated by the degree of significance with regard to translation quality. In the product-oriented approach, the target text readers are in the centre of attention. The starting point of product-oriented theory is the description of individual translations or text-focused translation description. Comparative

analysis of various translations of the same text, either in a single or in various languages, is also the area of research. These individual and comparative descriptions provide the data for investigation of large corpora of translations, focusing on a specific historical period, language, text type, etc.

After the dominance of linguistic and cultural approaches in the study of translation, the cognitive dimension emerged, bringing with it the shift in focus from the translation product to the translation process. *Process-oriented approach* mostly focuses on the translation process itself. The "black box" of the translator's mind as they create a new text in another language has become the subject of research of translation theorists. Recent publications on translation teaching demonstrate an increasing shift in scholars' focus from the study of translation as a target text end product to the source text analysis and the process of translation, involving the cognitive processing of a translator's mind. The process-oriented approach to translation teaching is based on two perspectives: internal and external. The internal perspective focuses on mental and psychological processes arising in translation, while the external perspective takes into account the social aspects of translation, in which many stakeholders are involved (cf. Palumbo, 2009). Thus, the process-oriented teaching approach demonstrates an increasing shift from the study of translation as a newly created text to the source text analysis and the process of translation itself, involving the mental processing that makes complex cognitive behaviour like translation possible. This teaching approach is also based on examining the behaviour of students while resolving translation challenges during the process of translation.

The *task-based approach* was developed within communicative language teaching in the 1990s. The teaching methodology advocates the authenticity of materials and activities, focusing on the students, the process of learning as well as the reflective practice of learning (Willis, 1996). The idea behind the task-based approach is that students learn more effectively when they are focused on a particular task they have to complete. The approach views the task as a unit on the basis of which the learning process takes place. The focus of task on student independence, authenticity and real-life situations makes it an efficient medium for acquiring and developing professional competences. In addition, the task-based approach draws students' attention to both the translation process and the translation product rather than the translation product alone.

Research into corpus-based translator training has attracted scholarly attention, particularly with respect to the application of corpora for pedagogic purposes. In *corpus-based teaching*, students examine corpus data using the principles of data-driven learning proposed by Tim Johns (1991) in foreign language teaching. Data-driven learning is an inductive approach in which students learn bottom-up from data observation. The scholar sees a student

as a researcher whose learning should be driven by access to linguistic data in order to identify the rules and patterns in the examples, thus discovering the characteristics of the translated text. The instructor, in turn, should provide the context in which students can develop their ability to note and learn regularities. In translation pedagogy, specialised corpora serve both as resources that assist in terminological work and as databases used for raising students' awareness of the process of translation.

Telecollaboration as a pedagogic practice, which is also referred to as virtual exchange, collaborative online international learning (Rubin & Guth, 2016) and globally networked learning, has been increasingly adopted in translator training over a recent decade. The growing attention of scholars and instructors has resulted in theoretical and empirical studies, which aim at creating a theoretical framework for the design of telecollaborative projects as well as sharing best practices. Telecollaboration translation projects employ a range of didactic solutions available to translation teachers. They may be simulated or real, online or blended with face-to-face activities. Furthermore, telecollaborative practice may vary in terms of project duration, degree of students' autonomy or teacher guidance, and reflection and assessment types. It may also involve various student roles, for example, the role of a commissioner, project manager, software localiser, terminologist, translator, editor, proofreader, etc. Thus, the presence of many adaptive working modes enables instructors to optimise the learning environment in order to meet students' needs. It should be noted that by expanding the learning space, technologies may also affect the cognitive, social and emotional development of students. The pedagogically sound use of technologies promotes active learning as it stimulates students' interest, increases motivation, improves productivity and ensures self-paced mode of learning.

In *emergentist pedagogy*, knowledge is a complex adaptive system which emerges "through the translator's embodied involvement (habitus) in actual translation experiences" (Kiraly, 2015: 203). Within the emergentist approach, students are active participants who seek to acquire knowledge, while teachers act as learning partners who guide students towards translation competence, which is a situated outcome of the dynamic interplay of human and material resources, personal, interpersonal and psycho-physical dispositions. The emergentist approach also relies on Donald C. Kiraly's (2000) social-constructivist approach, which is based on Lev S. Vygotsky's (1978/1994; 1986) concept of the social construction of knowledge and John Dewey's (1938) concept of learning through action.

Translation ecology is viewed as "the study of social, cultural, political, and economic factors affecting the interaction of humans with other humans, other organisms and the physical environment" in order to include "all forms of translation thinking and practice that knowingly engage with the challenges of human-induced environmental change" (Cronin, 2017: 2).

Translation principles, from the perspective of eco-translatology, involve multi-dimensional and selective adaptation being regarded as a three-dimensional transformation covering the dimensions of language, culture and communication in order to study translation for its broader development (cf. Hu, 2010). Hence, "the work of teaching and learning incorporates practice, research and teaching in equal measure" (van Lier, 2010: 1). Therefore, in the translation environment, it is necessary to take into account language communication, cultural background and practice environment.

With regard to translation teaching, this theory views the entire translation teaching process as a large and complex ecosystem. Eco-translatology focuses on macro research, developing a new vision for translation studies, which is based on the sustainable development of the reform of translation teaching.
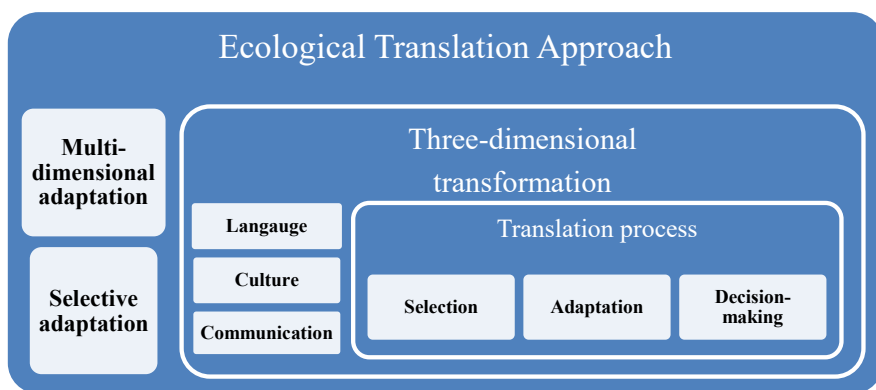
Fig. 2.2. Ecological approach to translation as a three-dimensional transformation process based on Hu (2010). (Developed by the author)

The number of theories devoted to translation teaching has considerably increased over the past decade. From the perspective of the evolution of the translation theories, the pedagogical implications of these theories can be evaluated in translator training. Translation theories were initially related to the study of translation end product, focusing on the issue of equivalence between the source and target languages. Therefore, they considered different types of equivalence, translation errors, text typology, translation approaches, strategies and methods. After the adoption of linguistic and cultural approaches to the study of translation, the scholars' attention was drawn towards the cognitive dimension that initiated the shift from the translation product to the translation process theories. The advances in technologies have considerably promoted the research into translators' activities as the contemporary digital tools can provide information on different stages of the translation process. The development of machine

translation and computer-assisted translation tools has affected not only the environment of professional translators but also the areas of teaching and learning. The acquisition of ICT skills relevant for translators can also be useful for the development of pedagogy due to requirements for the creation of appropriate learning environment, the use of computer-assisted and machine translation tools, and textual analysis of source and target texts.

The literature review has also revealed that there is an apparent shift from a teacher-centred to a student-centred approach. The digital age has enabled a shift from the transmissionist learning theory to the constructivist model. Thanks to social networking, learning has become a social experience taking place in a setting where an instructor supports the learning process and students construct their knowledge themselves.

Based on the literature review, the author considers the following principles to be important for specialised translation teaching:

- balance, integrity and relevance;
- knowledge as a complex adaptive system;
- students' construction of knowledge;
- combination of individual, collaborative and interactive learning;
- strategically designed learning activities and materials;
- reflection;
- student-instructor-technology interaction;
- use of computer-assisted and machine translation software, digital text analysis tools, translation corpora and termbases, etc.

Each teaching approach considered aims at improving and developing certain students' skills and competences by focusing on a *specific area, such as translation quality, translation process, personality development, collaboration, reflexive practices,* and *technology integration*. New translator's roles and competences required by the translation industry undoubtedly affect the translator education system, which calls for a deeper understanding of translation teaching and requires the implementation of reforms with regard to the teaching mode, student–instructor–technology interaction and translation teaching environment.

2.3. Teaching Specialised Translation in the New Media Age

The concept of competence implies more than just the acquisition of knowledge and skills; it involves the mobilisation of knowledge, skills, attitudes and values in a range of specific contexts to meet complex demands (cf. OECD, 2018). Recent research shows that the patterns of students' professional development vary. Students can demonstrate different levels of skills and competences at different moments depending on the learning situation. As students develop their competence in different domains of knowledge, they experience repeated cycles of learning in which their performance level may rise quickly and then drop as the focus of the task or the situational context changes. A challenge for education is to help students develop deeper understanding by facilitating both disciplinary and procedural knowledge, and connecting them with the skills, attitudes and ability to transfer knowledge (cf. Benander, 2018).

The process of translation competence acquisition is outlined through the study of various translation models. Understanding of the nature of translation competence is of high importance in translator training since it allows identifying the areas on which instruction should focus. Many models of translation competence have been developed to identify sub-competences that should be approached in translator training. According to Gregory M. Shreve (1997: 125), translation competence is "an endless process of building and rebuilding knowledge, evolving through exposure to a combination of training and continuous practical experience and leading to changes in the way that translators actually conceive of translation". In general, translation models "combine a number of different sub-competences that seem to include the world, the universe […] and are intricately interrelated" (Beeby, 2000: 185).

The analysis of translation competence has been primarily based on the theories presented by Pym (1992), Toury (1995), Hatim and Mason (1997), Schäffner (2000), Neubert (2000), Chesterman (2007), PACTE group (2017) and EMT (2009, 2017). With the increasing use of computer tools, the scholars have been expanding the multi-component model of competences to include new skills and proficiencies required in the field of translator training. Each area of translation competence is further subdivided into skills and abilities. The skills are clearly related to the integration and interrelation of the competence areas in the translation process. The overview of translation models has contributed to revealing the essential translation sub-competences.

Table 2.1. Translation Competence Models (Developed by the author)

Translation competence models by	Translation sub-competences					
Bell (1991)	Target language knowledge	Source language knowledge	Subject area knowledge	Contrastive knowledge	Communicative competence	
Nord (1991)	Transfer competence	Text production competence	Translation quality assessment	Linguistic competence	Cultural competence	
Hatim and Mason (1997)	Source text processing	Transfer competence	Target text processing			
Neubert (2000)	Language competence	Textual competence	Subject competence	Cultural competence	Transfer competence	
Schäffner (2000)	Linguistic competence	Cultural competence	Textual competence	Domain/subject specific competence	Transfer competence	Research competence
PACTE (2017)	Bilingual sub-competence	Extra-linguistic sub-competence	Knowledge of translation sub-competence	Instrumental sub-competence	Strategic sub-competence	
EMT (2017)	Language and culture	Translation competence	Technology	Personal and interpersonal competence	Service provision	

The EMT translation competence model is further referred to in the research. It should be emphasised that the model envisages that the competences do not exist in isolation.

2.3.1. The Contemporary Rhetoric of Specialised Text

Contemporary specialised texts as a rich source of field-specific knowledge are discussed to identify their information structure, hierarchical organisation and rhetorical modes of expression. The analysis of rhetorical strategies and devices in specialised texts may contribute to identifying the cognitive value of rhetorical devices beyond their specific persuasive and aesthetic value, thus overcoming difficulties of meaning decoding at different levels during information processing.

The language of science refers to professional communication or to a system of meaning creation. As part of professional communication system, specialised texts are the ones that contain vocabulary and terminology specific to a particular domain of knowledge. Initially, the frame of scientific writings implied the use of rules and conventions that limited the play of words, as the main aim was to avoid figurative language. However, today specialised texts are not purely neutral as they tend to incorporate mythical thinking, classical images and rhetorical

devices in scientific reasoning and explanation. Literary characters and celebrities have become the rich source of modern scientific terminology, such as *Faust program, Anna Kournikova worm, Ceylon programming language*. At present, rhetoric usually operates at the language level, but also, more or less frequently, at the contextual level of communication to get acquainted with new meanings of well-known lexical items.

The contemporary scientific rhetoric includes "those persuasive forms of reasoning or argumentation that aim at changing the belief system of an audience in scientific debates" (Pera 1994: 58). The concept of rhetoric is understood not only as "persuasive discourse" but also as the system triggering deep cognitive mechanisms that might provide reasonable explanations in the rhetorical model. Various forms of communicating (arguing, persuading, etc.) can be achieved through various language means. Therefore, rhetorical studies are concerned with how language and other symbolic forms influence the way a particular audience thinks, feels or acts.

Classical rhetoric has developed a set of rules, approaches, functions, strategies and methods that are used to achieve a certain communicative purpose. According to Daniel Anderson (2011: 178), rhetorical strategies are "methods of communicating the details of a message". With regard to specialised texts, the common rhetorical strategies are order (time order, space order, order of importance), comparison/contrast, metaphor/analogy, and illustration (cf. Trimble, 1985). Cezar Ornatowski (2007: 4) states that rhetorical approaches to science begin with different assumptions about the relations between practice, discourse and knowledge. They can also be described as the author's means of encoding information for the reader (cf. Baltiņa, 1999). The authors of specialised texts use rhetorical strategies to share their knowledge, to promote audience's awareness, understanding and acceptance of inventions and discoveries, and to shape public opinion. Rhetorical elements should transfer information in such a way that it would coincide or partially coincide with the world knowledge of the readers.

Information and communication technology has transformed the work environment of the 21st century translators, who must follow the trends in the industry and work with new channels of information. As a result of the development of digital media, the modes of creating and conveying relevant meanings in the translated texts have changed. It is apparent nowadays that information is transferred using different channels of communication. Visual–verbal mode refers to the application of drawings, schemes, tables, images, charts or any illustrative material, as the rhetorical function of visual aids is to add information, which is not provided in the text. It is the purpose of the translation instructor to train students in understanding the most difficult visuals used in special digital texts, such as flowcharts, graphs, etc. Thus, to address the

challenges raised by digital transformations, translation instructors should also place special emphasis on the importance of the non-textual information evolving around digital texts.

In the same way as information and communication technology has changed the range of competences to be possessed by translators, it has also extended the perception of specialised translation, which is no longer associated solely to specific terminology in the field. At present, specialised texts include new formats and new channels of information, requiring transcreation and localization of content. The language, structure and format of the specialised text have been changing and developing due to various factors, such as transdisciplinary character of scientific discourse, emerging domain of Internet linguistics, development of digital rhetoric, an apparent tendency for hybridisation of genres, and a shift from formal to the more colloquial style of writing (foregrounding) (cf. Iļinska, Ivanova, & Senko, 2016). Therefore, due to the development of multimedia and information technologies, the contemporary specialised texts have experienced rapid transformation with respect to *changing traditional modes of expression, promoting genre hybridity, foregrounding, intertextuality and multimodality.*

As a result of the above-mentioned changes, specialised translation teaching is characterised by the growing complexity of information structure and information density, as well as reliance on the background knowledge of the students. To activate the readers' background knowledge, the authors often use allusions to well-known sources (e.g., the Bible, Greek mythology, historical events) and/or professional books in different scientific domains, including the names of famous scientists. Intertextuality as a phenomenon strongly influences text interpretation. It consists of multiple layers and is based on background knowledge expressed in references, citations, metaphoric images, etc. The use of authentic specialised texts in a translation classroom helps develop students' ability to decode and create meaning through metaphorical and creative thinking, raise students' awareness of intertextual devices, promote their cross-cultural competence, as well as responsible decision-making skills.

At present, some scholars interpret the rhetorical aspects with greater focus on the digital aspect. Digital is no longer just one of the many different tools that can be used to enhance traditional rhetoric. In other words, as technology becomes more and more ubiquitous, the difference between traditional and digital rhetoric starts to blur. It is also assumed that technology and rhetoric can influence and change each other. Digital rhetoric may use traditional rhetorical theories, strategies and methods, as well as incorporate contemporary theories of visual rhetoric and computational rhetoric. Technologies have promoted the use of different modes to transmit information, and the digital environment, in its turn, has changed the modes of creating meaning, thus leading to multimodality of digital texts. Therefore, to

achieve effective communication, it is suggested to combine modes since some meanings are characteristic of particular modes that have their own potentials and/or limitations.

2.3.2. The Rhetorical Model of Specialised Translation Teaching

The rhetorical model aims at engaging cognitive dimensions of learning and enhancing students' ability to discover and maximise their unique strengths through collaborative inquiry. The model also emphasises the role of procedure, during which students learn how to learn. The model proposed by the author of the Doctoral Thesis can also be useful for the design and development of teaching materials and tasks in the context of specialised translation and digital rhetoric at the tertiary level.

The author of the Doctoral Thesis suggests that the translator training with regard to teaching and learning activities should be based on the following principles:

- authenticity (with regard to materials and activities);
- variability (selection of texts for translation from simple towards more complex);
- translatability (focus on overcoming different translation challenges);
- personalisation (selection of tasks to meet specific students' needs);
- digitalisation (application of digital tools).

Specialised translation teaching should be extended in the classroom to include more than terminology alignment and adherence to the scientific style of writing. The translation tasks should contain translation difficulties at a level of difficulty appropriate for students. Moreover, the activities should be meaningful in order to engage students in the problem-solving and decision-making process. It is necessary to ensure the interaction of student-instructor, student-student and translation teaching environment.

Training activities should enable students:

- to identify potential localisation problems of a special text in a particular field;
- to become aware of the digital analysis tools;
- to promote their awareness of translation challenges caused by intertextuality, foregrounding, cross-cultural aspects, contextual meanings, and field-specific terminology;
- to become aware of the principles of linguistic economy as a recent trend of scientific and technical language;
- to strengthen their collaboration and teamwork skills.

The rhetorical model of specialised translation teaching takes into account the principle of wholeness. It focuses on the critical analysis of the source text (by identifying its form and function, lexical means, created effects, readers) and creation of the target text in compliance with the conventions of the target culture and commissioner's requirements (see Fig. 2.3). The application of the model results in practicing all types of activities representing the real professional environment.

Harmonising the TT by ensuring the balance of rhetorical appeals → **Creating** the harmonised TT

Evaluating the TT based on the translation quality assessment metrics → **Evaluating** the TT

Comparing the ST and TT through the analysis of rhetorical strategies and devices → **Analysing** the ST and TT

Producing the TT applying the rhetorical theory of argumentation, composition and style → **Applying** the knowledge in TT production

Understanding the macro and micro structure of the ST through the rhetorical analysis → **Understanding** of the ST

Identifying the general information of the ST (manually or using digital tools) → **Recognition** of the ST

Fig. 2.3. Rhetorical model of specialised translation teaching in relation to Bloom's revised taxonomy. (Developed by the author)

The author suggests distinguishing the following stages in translator training to develop students' translation competence: *data collection and analysis*, *target text creation, editing/proofreading and reflection*. Within practical activities, students learn to identify text types, determine characteristic features of a particular text type, apply the basic principles of text organisation and choose appropriate digital tools to facilitate the process of text analysis.

At the *stage of data collection and analysis*, students first are introduced to a text; then they identify key concepts (the main idea of the source text, the keywords of the source text, the relevant and even irrelevant information) and collect available information on the main concepts. Such digital tools as TextAnalyst, MALLET, Leximancer, InfraNodus, and WordCloud can be used to gather and process the information of the source text. Using the appropriate digital tools students determine the frequency of words, identify patterns characteristic of a text, find all meanings and undertones, draw a diagram of the concept sphere

of the source text, make a glossary of terms, etc. Training activities can be based on the use of specific methods of digital text analysis, such as concordance, the frequency analysis, topic modelling identifying the reoccurring theme of texts based on computational linguistics and common words, and the statistical analysis of style (stylometry) (cf. Ivanova, 2019). Specialised translation teaching requires students to become more educated, capable of using different tools and resources in order to understand, convey or create additional, often implicit, meanings.

The author proposes focusing on the following categories during the **text analysis**:

- thematic environment (subject of the text, the principles of content organisation);
- overall structure of the text (the use of rhetorical strategies);
- meaning relationships (identifying links at the linguistic and conceptual levels of the text);
- special language (terms, professionalisms, abbreviations, slang, nonce formations);
- literary language (the use of rhetorical devices such as metaphor, metonymy, simile, personification, etc. to masterfully strengthen the text);
- sentiment (the application of positive/neutral/negative expressions to demonstrate the attitude to the topic/idea communicated);
- multimodality (the use of different sign systems for meaning representation).

On the basis of the identified categories for text analysis, the respective activities can be proposed to students. The tasks can be divided into groups depending on their overall purpose. The author of the study proposes the following groups: tasks related to the *macro and microstructure* of the source text (see Tables 2.2 and 2.3).

Table 2.2. Evaluating Macro Perspective of the Specialised Text (Developed by the author)

Element under analysis	Question-based analysis
Author	Who is the author of the text under discussion?
Reader	Who is the author's intended audience? Determine the author's attitude to the audience. Identify techniques and methods used by the author to capture interest of the audience.
Text purpose	What is the purpose? (To inform? To educate? To amuse? To persuade? To argue? To criticize?)
Text function	What is the function of the text?
Text type and genre	Define the type and genre of the source text and substantiate your decision. Specify the main features of the source text.
Mode of communication	What modes are used in the text to convey meaning? What is the function of each mode?

Table 2.3. Analysing Microstructure of the Specialised Text (Developed by the author)

Element under analysis	Question-based analysis
Terminology	Make a list of terms related to the topic under consideration.
Rhetorical strategies	Identify rhetorical strategies, as well as determine their role in the text.
Intertextual references	Identify intertextual references in the text.
Cross-cultural aspects	Identify culture-specific items (if any) and find their interpretation.
Aspects of linguistic economy	What means of compressed information transfer are present in the text?

Text analysis that can be considered one of the constituents of translation training allows investigating the organisation of specialised texts. The new possibilities to text analysis provided by digital tools show a rich potential that should be employed in the teaching process of translators.

During the *target text creation stage*, students also work with text corpora, explanatory and etymological dictionaries, termbases, as well as use computer-assisted translation tools. Producing the translation, students should take into account the rhetorical theory of argumentation, composition and style.

Editing stage involves the critical analysis of rhetorical strategies and devices used in the target text. Students should carefully examine each translated sentence, making sure that it complies with the aim, structure, and style of the source text. Students also check for errors related to terminology alignment, accuracy, linguistic conventions, style and locale conventions. *Proofreading* involves checking for grammatical and spelling mistakes.

At the *reflection stage*, students evaluate the analysis/summary abstract or the translation produced by the group mates and reflect on the feedback provided by an instructor. Reflection is important for student self-evaluation, which fosters an attitude of inquiry. This way, students may discover what they have learnt, identify what they still lack, formulate learning needs and more actively direct their process of learning.

For the 21st century translator affected by digitalization, artificial intelligence and smart automation, the rhetorical model also serves as a description of the emerging skill sets. Rhetoric involves not only learning and implementing new tools and techniques; it also involves making information understandable, relevant and appropriate. Specialised translation teaching has been examined through the prism of rhetoric as a process of meaning creation. Within practical activities, students learn to identify text types, determine characteristic features of a particular text type, apply the basic principles of text organisation and choose appropriate digital tools to facilitate the process of text analysis.

2.4. Empirical Research Methodology: Approbation of the Rhetorical Model of Specialised Translation Teaching

The fourth chapter of the Doctoral Thesis presents the methodological approach of the present research.
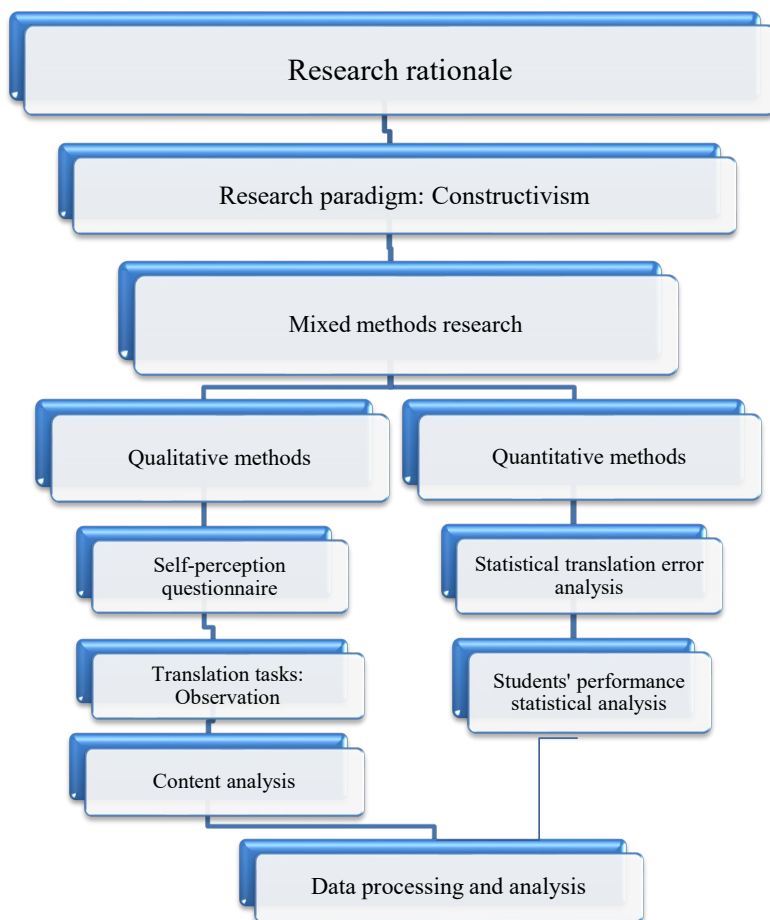
Fig. 2.4. Methodological approach of the research. (Developed by the author)

Research paradigm. The use of research paradigms, in general, depends on the goal of the research. A research paradigm can be viewed as a system of interrelated practice and thinking that define the nature of enquiry along these three dimensions. Ontology concerns the nature of reality, epistemology deals with the nature of knowledge, and methodology focuses on the ways to understand the world and on justified approaches to exploring it. The three-fold

classification of research paradigms into such philosophically distinct categories as *positivism, interpretivism* and *critical postmodernism* (Gephart, 1999) is considered relevant for the present research. The philosophical assumptions underlying the present research come from *interpretivism* and *critical postmodernism* (as it supports constructivist philosophies). Interpretive approaches can provide a better understanding of the nature of the educational process by addressing issues of influence and impact and asking questions such as "why" and "how", which help design an effective learning experience (Fink, 2013). It should be noted that constructivism is closely related to interpretivism. If interpretivism addresses essential characteristics of shared meaning and understanding, constructivism extends this issue with the process of knowledge construction. In the context of the research, students construct their knowledge within the socio-cultural context, which is influenced by their prior knowledge and understanding. It is essential to emphasise that translation is the process of constructing meaning: translators decode the meaning of the source text and construct it in the target language, which is then reconstructed by the target readers (cf. Williams, 2013). From this perspective, the constructivist paradigm is relevant for exploring the translation process. Therefore, applying the constructivist paradigm to the current research, the author attempts to explore the way students construct knowledge and apply it in practice. As the focus is on the socially constructed nature of reality, the translation environment has to be created taking into account the internal and external factors influencing the learning process (such as student–instructor interaction, peer-to-peer collaboration, the choice of teaching methods and approaches, and digital tools employed).

Qualitative Approach

Qualitative research focuses on the behaviours and meanings that participants bring to situations, and intends to obtain a deep understanding of participants' experience. It allows a variety of empirical data to be collected. To explore the nature of specialised translation teaching, several research methods have been used: self-perception questionnaire, translation tasks, and content analysis.

Translation tasks provide the data with regard to learning activities, themes, and knowledge students construct. Translation tasks are authentic materials selected from the real world. University-level teaching of translation tends to focus on task knowledge by practising text production for two reasons. First, by analysing and discussing translation, students can be trained as translation thinkers and problem solvers (Dam-Jensen and Heine, 2009). Second, one of the goals of translation tasks in teaching is to provide students with an experience of professional reality: target text creation can help reveal translation skills and competences

acquired by students. Within the framework of the research, authentic English-specialised texts have been chosen for students majoring in technical translation. Specifically, the exploration of the translated texts was to provide a general idea of how the students would manage the task and how they would deal with translation difficulties. Content analysis has been used to evaluate students' performance and knowledge in producing translations and examining the relevant pedagogic issues.

Quantitative Approach

Quantitative research relies on measuring variables, analysing these measurements, and reporting relationships and associations among the studied variables (Table 2.4).

Table 2.4. Data Collected for the Analysis through the Translation Tasks

Translation Process Assessment	
Primary competence(s) to be assessed	*Personal and interpersonal competence, technological competence, strategic and thematic competence.* The ability of students to translate a text by following a procedure consisting of data collection and analysis, target text creation and editing/proofreading.
Variable	Duration of data collection and analysis stage, target text creation stage and duration of editing stage.
Analysis	• Relationship between the time spent in each stage before training, during training and after training. • The total time spent to perform a translation task before training, during training and after training.
Translation Product Assessment	
Primary competence(s) to be assessed	*Language and culture competence, translation (strategic, methodological and thematic) competence, service provision.* The ability of students to find an acceptable target text functional analogue to the difficulties proposed in the text.
Variable	The weight of translation errors.
Analysis	• Relationship between the time spent on data collection and analysis and the quality of translation measured by the number of errors. • Relationship between the time spent on editing and the quality of translation measured by the number of errors.

Students were given translation task No. 1 to understand the students' initial performance and to compare the data received from the self-perception questionnaire. The data measured included how much time the students spent to perform a translation task in general and the time invested in each stage of translation process (data collection and analysis, target text creation and editing). The aim of translation tasks No. 2 and No. 3 was to determine students' approach to solving translation challenges and whether their approach changed during the training that was focused on the application of the rhetorical strategies and techniques, translation methods, and computer-assisted translation tools. Changes in the editing stage are assumed important as they signal a moment of critical and creative thinking, decision making thus indicating that students are searching for solutions to the translation challenges encountered. The duration of editing stage can be caused by different reasons: to search for a translation variant, to assess, improve or delete the previously translated segment. It is assumed that a decrease in the time and number of changes might signal an improvement in the students' ability to solve translation challenges. Translation task No. 3 was also aimed at assessing the quality of translation tasks fulfilled by students before training and after training.

2.4.1. Translation Quality Assessment

Over the past 30 years, many methods of evaluating translation quality have been developed and proposed. Malcom Williams (2004) classifies these methods into two categories: quantitative-centred systems and argumentation-centred systems. Williams characterises quantitative-centred methods by some method of error counting, while argumentation-centred methods take a more holistic approach. The advantage of the quantitative-centred methods is that they quantify errors and, therefore, make measurements possible.

As translation quality can be measured by the ratio of errors, a distinction should be made between a change and a correction because not every change corrects a real error. Therefore, the error should be identified in terms of category (a type of an error), subcategory (a subtype of an error), and weight (severity of an error).

Category and Subcategory

To categorise errors, the present research uses the Multidimensional Quality Metrics (MQM) (https://themqm.org/), which is a translation quality assessment framework that provides metrics for evaluation of target text.

The most important criteria for evaluation of translation:

- There are no spelling or grammatical mistakes.
- The translator has used the appropriate terminology consistently.
- The translation conveys the meaning of the source text accurately.
- The style of the translation corresponds to the source text (unless required otherwise by the commissioner).
- The translated text is fluent.
- Culture-specific aspects have been adapted to the target culture.
- The translation complies with the commissioner's guidelines and requirements.

The above-mentioned criteria are reflected in the five main quality categories of MQM that have been adopted for the goal of the research:

- terminology;
- accuracy;
- linguistic conventions;
- style;
- locale conventions.

Weight

Following best practices, errors can be divided according to their relative importance (or the severity of their impact on translation quality) into three groups: **minor, major** and **critical**. Minor errors "are noticeable but […] do not have a negative impact on meaning […], [m]ajor errors […] have a negative impact on meaning […], and critical errors […] have major effects not only on meaning but on product usability […]" (O'Brien, 2012: 62). Not all errors are equal. For example, there is a difference between a typo on the front cover of a manual and the same typo in a footnote. There are also typos that alter the meaning of a word, and typos that do not lead to confusion. Therefore, different weights should be assigned to errors depending on their consequences. Each type of error was awarded a point on the scale from 1 to 3.

Table 2.5. Type of Translation Error and Score (Developed by the author)

Type of translation error	Score	Description
Minor	1	Noticeable errors that do not have critical effect on meaning
Major	2	Errors that have a negative impact on meaning
Critical error	3	Errors that have a negative impact not only on meaning at a word/sentence level but also at a paragraph/text level.

As each translation task consisted of 10 challenges, translation of which was evaluated from the perspective of the translation errors made (0 – no errors; 1 – minor error; 2 – major error and 3 – critical error). The maximum weight of errors is 30 (unacceptable translation). See Table 2.6 for conversion scale of errors to the assessment of translation quality according to a 10-grading scale.

Table 2.6. Error Conversion Scale (Developed by the author)

Weight of errors (points)	Mark
0–1	10
2–3	9
4–6	8
7–9	7
10–12	6
13–15	5
16–18	4
19–30	Failed

2.4.2. Respondents

The respondents were two groups of students of the professional Bachelor study programme "Technical Translation" at the Faculty of Computer Science, Information Technology and Energy (before the consolidation process (until 31 December 2023) the Faculty of E-learning Technologies and Humanities) of Riga Technical University. The first group consisted of 8 students in academic year 2019/2020, and the second group consisted of 19 students in academic year 2022/2023 (autumn semester). The students of both groups were in their fourth semester of study and had passed several courses in grammar, analytical reading, fundamentals of written speech, and specialised theoretical and practical courses in the field of translation. In order to have a homogenous group of respondents, the author of the Doctoral Thesis selected the students specialising in the translation of specialised texts from English to

Latvian and vice versa. There were both male and female respondents. All of them were in the age range of 20 to 26 years.

Ethical practices and strategies were taken into consideration to ensure that the research was conducted in an ethical research environment. The respondents were informed about the aim of the research and their right to refuse to participate in the research. Participation was voluntary. Data were collected anonymously. The principles of the Code of Conduct for Scientists were applied and followed through the entire process of the research (Latvian Academy of Sciences, 2017).

2.4.3. Procedure of the Research

First, a self-perception questionnaire was given to the both groups of the students. The questionnaire had eight questions related to students' translation habits. The questionnaire aimed at identifying students' awareness of the translation process stages and determining any gaps in translation related skills and abilities. The first four questions dealt with the stages of the translation process and students' activities, skills and abilities at each stage. The purpose of the fifth question was to find out translation issues that students found most difficult. Questions 6 and 7 addressed the issue of computer-assisted and machine translation tools. Question 8 served to reveal the students' activities undertaken to improve their professional skills (see Appendix 1).

According to the results of the self-perception questionnaire, the students should improve skills in the analysis of the source text at the micro level, as well as acquire basics of editing and proofreading skills. Based on students' responses, attention should be paid to the creation of target texts that have different purposes compared to the source text, and the use of computer-assisted/machine translation tools. The results related to the proofreading and editing stage demonstrate that students consider that they are able to correct linguistic and style errors, organise and structure the text, as well as work with visual information. The challenging issues concern the knowledge of established reference manuals and guidelines. The students should practise using various computer-assisted/machine translation tools depending on the situation, and they should be able to determine which tools to use and for what purpose.

All three tasks were English-to-Latvian translation tasks. The texts to be translated were excerpts (with a length of between 1700 and 1800 printed signs) from popular science books in English. Each translation task focused on 10 translation difficulties pre-identified by the author

of the research, such as accuracy, linguistic and style errors, terminology alignment as well as locale conventions.

In all translation tasks, students were allowed to use translation tools and resources, such as computer-assisted tools, online termbases, glossaries, etc. The texts were selected on the basis of pre-identified translation difficulties from a translation decision-making perspective, which required students to search deeper in order to find a relevant solution online. The choice of target language variants for some translation challenges required students to develop their own translation techniques and approaches. Each subsequent task contained some familiar translation difficulties from previous tasks and some new situations to students. This way, the students' progress in fulfilling their translation tasks could be evaluated.

Analysis of Students' Performance

The research was carried out in academic year 2019/2020 and 2022/2023 at the Institute of Applied Linguistics of the Faculty of E-learning Technologies and Humanities at Riga Technical University (since 1 January 2024 – the Institute of Digital Humanities of the Faculty of Computer Science, Information Technology and Energy). The research involved 27 students of the professional Bachelor study programme "Technical Translation".

The quality of the text students created before the training was assessed using the error analysis. As the translation task contained 10 translation difficulties pre-identified by the author of the research, the translation of the challenging items was evaluated using the scale 0–3, where 0 refers to no error, 1 – minor error, 2 – major error and 3 – critical error. The weight of errors varied from 3 to 15. According to the error conversion rate, the student's weight of errors was converted to the mark. As discussed previously, one of the variables measured in the research is the duration of the data collection and analysis stage, target text creation and editing stage. The students were grouped by the mark obtained, and the average duration of each stage was calculated (see Appendices 2 and 3).

The results of both groups of students (comprising a total of 27 students) are analysed to demonstrate trends in students' translation behaviour.

Data collection and analysis stage. The students were grouped by the mark gained for the translation tasks fulfilled and the mean value of the data collection and analysis stage (in seconds). According to the results of students' translation behaviour before training, not all of them had a full understanding of the efficient translation process, because students approached the translation process differently.
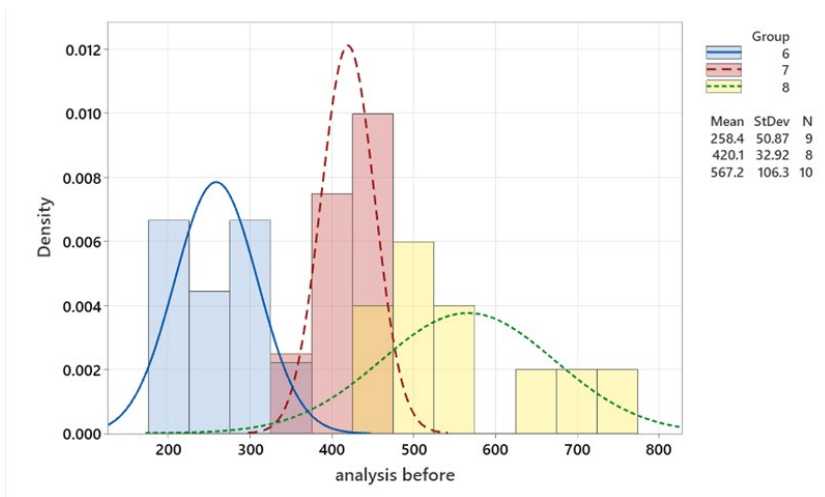
Fig. 2.5. The data collection and analysis stage before training.

Two contrary attitudes were observed before the training, as there were students who spent much time to perform the analysis of the source text (up to 20 % of the total time), and, on the other end, there were students who devoted insufficient attention to the analysis stage (less than 5 % of the total time). The students with initially low level of competence performed the analysis stage quickly as they did not recognise the importance of this stage for the whole translation process (students' efficiency) and the quality of the translation product. The students with the competence level above average took an excessive amount of time to perform the analysis, which could be explained by the fact that the development of competence and application of knowledge in practice takes time.

At the end of the training, the students' performance demonstrates a smooth trend towards the analysis ratio comprising 10–15 % of the total time devoted to complete the translation task (see Fig. 2.6). The finding is in line with the Deming's theory that implies that planning/analysis is a crucial component in the quality assurance system. Having recognised the importance and benefits of the analysis stage, students, who initially devoted insufficient time to it, changed their approach to translation by performing the systematic analysis of the source text. According to the data, as the analysis time increases, the total time to perform a translation task decreases. The analysis process is determined by the analysis efficiency (skills) and the analysis time.
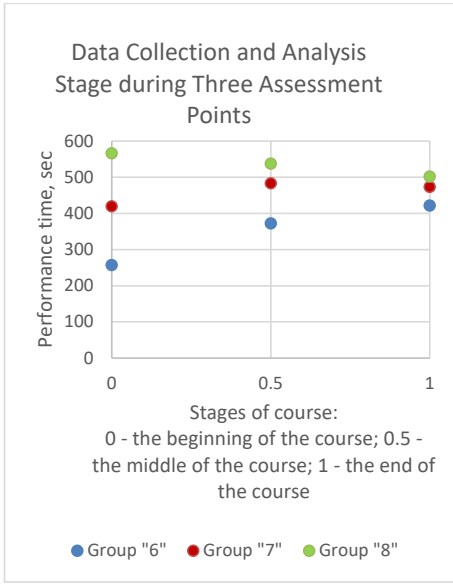
Fig. 2.6. Changes in the data collection and analysis stage during three assessment points.
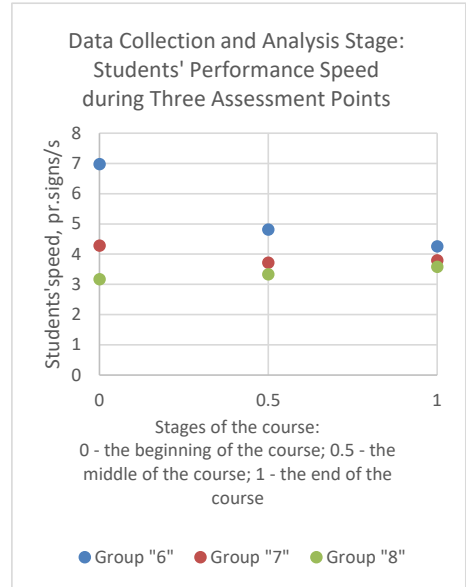
Fig. 2.7. Students' performance speed at the data collection and analysis stage during three assessment points.

The results obtained for the data collection and analysis stage (Fig. 2.6) have been used to demonstrate the trend in the students' speed of conducting the analysis of the source text (see Fig. 2.7).

The research results are in line with the Dunning–Kruger effect. According to the Dunning–Kruger model (1999), people who are incompetent in a given area do not recognise their incompetence, i.e., they lack skills, and they are unaware of their incompetence. As people learn more about the topic, they begin to recognise their own lack of knowledge and ability. Then as people gain more information and training, their competence levels begin to improve. It can be stated that as students learn more, they are better able to recognise their errors. The Dunning-Kruger model brings in a time dimension, i.e., knowledge evolves over time.
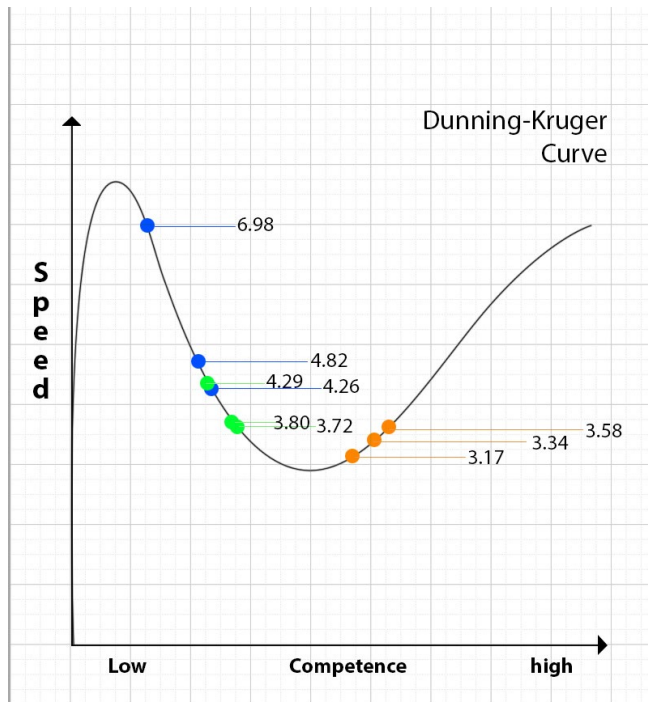
Fig. 2.8. The changes in the performance of three groups of students depending on their level of competence during training. *Blue points represent the students with the competence level below average, green points represent the students with the average level of competence, and orange points represent the students with the competence level above average.*

Figure 2.8 demonstrates changes in the performance of three groups of students depending on their level of competence during training. The results of the students' performance are plotted on the Dunning–Kruger curve. The students with the competence level below average (blue triangles) perform the analysis stage fast (6.98 pr. signs per second). During training, their speed decreases (4.26 pr. signs per second), while competence increases. On the contrary, the students with the competence level above average (orange triangles) perform the analysis stage slowly (3.17 pr. signs per second). In the process of training, they strengthen their competence and performance, which leads to a gradual increase in speed (3.58 pr. signs per second).

Applying the Dunning-Kruger model in the teaching process makes students aware of their unknown areas and provides the opportunity to change their learning style and practice. Low performers usually prefer ready-to-use resources and guidelines, they do not properly receive criticism, overestimate their skills, fail to recognise the expertise of other people and do not recognise their own mistakes and lack of skills. Therefore, for the students with the level of

competence below average, it requires reflecting on their actions and experiences to realise that their own self-assessments and, as a result, their actions are likely incorrect. For example, if decisions to solve certain learning tasks are made based solely on their own personal knowledge and skills, there is a high probability of making mistakes and misinterpreting information.

The students with the average level of competence spend much time to make informed and reasonable decisions, they constantly check if something is supported by evidence. To increase their motivation, the learning process should be meaningful and relevant. Instructors should remember that allowing for self-doubt is an important step in the learning curve that results in improved performance. Overconfidence does not motivate the student to improve; there should be periods of doubt and low self-confidence in order to develop skills and improve performance with time and perseverance.

The students with the level of competence above average perform tasks easily and do not realise that it is challenging to others. They often underestimate their level of skills relative to their group mates. Training should help them to become more aware of their own and other students' skill levels. It would help them in the group activities (teamwork) to communicate more clearly with group mates who are less proficient than themselves.

Recognising and understanding the Dunning–Kruger curve helps students to take responsibility for their professional development and sense of self-confidence. It can encourage students to recognise their weaknesses, skill gaps and beware of the inverse correlation of self-confidence and competence. For overconfident students with a level of competence below average, it is necessary to provide facts and feedback from multiple sources, as well as to set clear expectations for measures of competence (learning outcomes) and formulate potential consequences if the requirements are not fulfilled.

2.5. Interpretation of the Results

As for the analysis of the data gained from the students' self-perception questionnaire, it has served as the framework to collect information about the students' translation behaviour and their awareness of the translation process stages. However, it should be noted that the results of translation task 1 demonstrated a discrepancy between students' perceptions of their abilities in the main stages of the translation process and their performance in real life. It can be concluded that not all students are able to appropriately assess their skills and competences. Therefore, student activity in completing translation tasks can be used to predict the progress of other groups of students in the same course.

By comparing the results of translation task 1 and translation task 3, it can be noted that the ability of students to translate has changed from rendering the direct meaning of short translation units to providing a sense-for-sense translation taking into account the macro level of the text. The training made students resolve the translation issues by collecting additional information, analysing the context, consulting reliable sources, etc.

The obtained data demonstrate improvement (and, in some cases, stability) for the parameters related to the weight of errors and the mark gained. Considering that the complexity level of translation tasks was higher, stability in the mark earned could be considered a positive indicator, since students were able to deal with the new challenges.

Applying the Dunning–Kruger model in the translator training allows locating the students on the performance–competence curve, which demonstrates that students at the lower end of the competence spectrum have lesser capacity to recognise the level of their skills. The model describes students' performance and provides explicitly structured feedback on their prospective scenario of development. Recognising and understanding their position on the Dunning–Kruger curve help students to take responsibility for their professional development and sense of self-confidence. It can encourage students to recognise their weaknesses, skill gaps and beware of the inverse correlation of self-confidence (performance) and competence. The Dunning–Kruger effect has major implications on students' decision-making process and actions taken.

According to the results obtained, the application of the developed rhetorical model for specialised translation teaching resulted in the understanding of students' learning process and progress in the course.

The results covered:
- linguistic and cultural competences as the students started to consciously, responsibly and creatively approach culture-specific items by proposing appropriate functional analogues in their translations taking into account the target culture norms and conventions;
- technological competence as the students started to effectively use search engines, corpus-based tools, text analysis tools, computer-assisted and machine translation tools;
- translation (strategic, methodological and thematic) competence as the students demonstrated progress in performing the analysis of the source text, which resulted in the choice of appropriate translation strategies and resources needed for target text creation; they demonstrated their ability to justify their translation

solutions, applying the appropriate theoretical approaches; they also started to apply quality control checklists in the editing process of their translations;

- personal and interpersonal competence by rationally planning and managing time, complying with deadlines, instructions and specifications, collaboratively working with group mates;
- service provision competence by demonstrating compliance with professional ethical codes and standards (sense of responsibility, confidentiality) and applying the quality management and quality assurance procedures to meet the pre-determined quality standards.

The research results contribute to existing teaching and learning practices through the adoption of the rhetorical model to the translation process of authentic specialised texts.

The rhetorical model of specialised translation teaching can be used to plan and design learning activities, as well as guide the acquisition of translation sub-competences. For the rhetorical model to work efficiently in specialised translation teaching, it is necessary to observe several requirements. First of all, specific theoretical aspects should be taken into account before designing the tasks based on the use of authentic specialised texts. As has been noted above, contemporary specialised texts have experienced rapid transformation with respect to new modes of expression, genre hybridity, foregrounding, intertextuality and multimodality. The intertextual devices express implicit meanings that are often hidden in special words and images. Therefore, the tasks designed for the students should cover the issues of hidden meaning interpretation, cross-cultural and intertextual awareness raising, analysis of visual information, as well as the study of principles of linguistic economy achieved through the use of abbreviations, allusions, metaphors, etc. The students should develop their information processing skills, recognising that the interpretation of the specialised text should be performed taking into account not only pragmatic aspects but also the most complicated cognitive aspects. Translation is the continuous process of making rhetorical choices in linguistic forms and communicative strategies. With regard to the development of translation sub-competences, specialised texts have been accurately selected in terms of translation challenges, as well as tasks were designed based on the principle of increasing difficulty.

3. Research Conclusions

The conclusions have been made with regard to the developed rhetorical model of specialised translation teaching and the performance data obtained during the students' translation process.

1. The developed rhetorical model of specialised translation teaching describes the translation process that is based on the critical analysis of the source text and the creation of the target text according to the accepted linguistic and textual norms of the target culture. The rhetorical model offers six stages of action from the identification of the source text features to the creation of the target text: Identifying – Understanding – Producing – Comparing – Evaluating – Harmonising. The identification stage focuses on recognising the key concepts, determining the rhetorical situation. The understanding stage involves the detailed analysis of the macro and micro structure of the source text. The production stage involves creating the target text using the appropriate computer-assisted translation tools and digital resources. The comparison stage deals with careful examination of each translated sentence in terms of correspondence to the aim, structure, and style of the source text. The evaluation stage involves assessing the quality of translation with regard to such categories as terminology alignment, accuracy, adherence to linguistic conventions, style and locale conventions. The harmonising stage involves the improvement of translation based on the feedback provided either by a group mate(s) or an instructor.

2. Practical activities have been proposed in the Thesis to develop students' ability to meaning creation and comprehension through the Conceptual Blending Theory and Cognitive Metaphor Theory. With the tasks provided, it has been demonstrated how the interpretation of specialised texts should be based on the interdisciplinary analysis and the application of background knowledge, including information about arts, sciences, history and philosophy. The set of exercises presented in the Thesis has been designed to develop students' problem-solving skills in different translation situations. The development of translation competence involves information literacy, analytical, critical and creative thinking skills, responsible decision-making, collaboration and self-organisation.

3. Translation is one of the types of activities "in progress" and, as a result, the acquisition of translation competence is an open-ended and life-long process. The author of the Thesis assumes that the exchange of experience and good practices is influential in the development of the translation competence.

4. The interpretation of students' translation teaching process results has been based on the Dunning-Kruger model. The application of the Dunning-Kruger model allows the instructor to

evaluate the learning process of the students with different levels of competence and provide a personalised learning support.

5. The students' performance data are obtained directly from the data of learning process, rather than the survey data used by Dunning and Kruger in their model development. Compared to the students' self-perception questionnaire, the students' performance data provide more accurate results as they are less affected by the students' subjective attitude.

6. Determining the students' location on the Dunning-Kruger model enables instructors to apply relevant teaching approaches in order to encourage students to improve their skills and abilities. The downward and upward trends of the performance-competence curve illustrate the student's development dynamics allowing the instructor to forecast a minimum and maximum increase in student's performance upon completion of the study course.

7. Based on the performance and competence level, students are grouped into low performers, average performers and high performers.

8. Low performers who possess a level of competence below average are highly confident in their skills and, therefore, should be encouraged to perform an activity more fully instead of relying on their experience. It is necessary to provide evidence, factual information and feedback from multiple sources, as well as to determine clear, measurable results (learning outcomes) and explain the consequences if the set requirements are not fulfilled. Without feedback about what is regarded as an effective performance, students with a competence level below average overestimate their own skills and do not progress.

9. Average performers are characterised by an inquiring learning pattern and doubting behaviour, i.e., they constantly check if the chosen translation variants, terms and expressions are supported by evidence. To develop their skills takes time as they need to practise in order to gain experience in different situations, thus receiving a possible scenario for action in similar cases. Prior knowledge is important to be able to find new perspectives on challenges and evaluate and propose effective and relevant solutions.

10. High performers usually perform tasks easily and do not realise that they are challenging to others. Training should focus on making them more aware of their own and other students' skill levels. It would help them in the collaborative activities to communicate more clearly with group mates who possess a lower competence level.

11. The author forecasts that specialised translation training will have its place in the future since machine translation will not be able to resolve all the translation issues in specialised translation, such as conceptual differences, intercultural differences or interpretative issues.

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Appendices

Appendix 1: Self-perception Questionnaire

Dear students,

Your participation in the survey is voluntary. The survey is intended to be anonymous, and all efforts have been made to ensure anonymity. Please complete the questionnaire on your translation process.

1 a) For each translation stage, tick the option(s) you think matches your skills best.

Pre-translation stage: Data collection and analysis of the source text.

- ☐ I can identify necessary background information (the audience, text type, end-use of the target text, etc.).
- ☐ I can identify key concepts (the main idea of the source text, the keywords of the source text, the relevant and even irrelevant information).
- ☐ I can collect available information on the main concepts.
- ☐ I can identify rhetorical appeals.
- ☐ I can perform the microstructure analysis of the source text.
- ☐ I know how to use digital tools (e.g., WordCloud, TextAnalyst, MALLET, InfraNodus) to gather and process the information of the source text.

2 b) Translation stage

- ☐ I can select the most suitable translation strategies, lexis, terminology, syntax, and style and reformulate texts where necessary.
- ☐ I can select translation strategies, lexis, terminology, syntax and style and justify their choice.
- ☐ I can easily reformulate a wide range of texts and produce target texts with a different purpose from their source texts.
- ☐ I know how to use computer-assisted/machine translation tools and state-of-the-art software.

3 c) Proofreading and Editing stage.

- ☐ I know editing methods and practices.
- ☐ I know established reference manuals and guidelines.
- ☐ I can determine whether the content of the text suits the target audience.
- ☐ I can correct errors related to terminology consistency and accuracy.
- ☐ I can correct linguistic and style errors.
- ☐ I can organise and structure the text.
- ☐ I can ensure consistency of style and information within a text.
- ☐ I can work with visual information.

4 d) Reflection stage.

☐ I request constructive feedback on my work.
☐ I accept criticism with the intent to learn and improve my skills.
☐ I never reflect on the translations made.

5. Rank the following translation issues that you find less difficult (1) to most difficult (5):

	1	2	3	4	5
Terminology alignment	○	○	○	○	○
Accuracy	○	○	○	○	○
Linguistic conventions	○	○	○	○	○
Style	○	○	○	○	○
Locale conventions	○	○	○	○	○

6. Which translation tools do you regularly use and why?

7. What do you use machine translation for?

☐ Draft translation
☐ Gist
☐ Other purposes

8. How do you improve your professional skills?

☐ I keep up with changes in the field(s) of specialization.
☐ I read in my source and target languages to keep up my vocabulary.
☐ I develop glossaries and share them with my group mates.
☐ Other.

Appendix 2: Data obtained from the translation process of translation tasks by the students (academic year 2019/2020)

Distribution of Students by the Mark and Duration of Each Stage before Training (academic year 2019/2020)

Mark before	Duration of data collection and analysis stage (sec)	Average duration of data collection and analysis stage (sec)	Duration of target text creation stage (sec)	Average duration of target text creation stage (sec)	Duration of editing stage (sec)	Average duration of editing stage (sec)
6	277		4200		490	
6	280	279	3920	4060	440	465
7	380		3700		520	
7	420		3426		362	
7	458	419	3206	3444	386	423
8	652		2832		264	
8	448		3648		472	
8	563	506	3208	3428	316	394

Mark before	Average data collection time (sec)	Data collection and analysis stage, %	Average target text creation time (sec)	Target text creation stage, %	Average editing time (sec)	Editing stage, %	Total
6	279	5	4060	85	465	10	4804
7	419	10	3444	80	423	10	4286
8	506	12	3428	79	394	9	4328

Distribution of Students by the Mark and Duration of Each Stage during Training (academic year 2019/2020)

Mark during	Duration of data collection and analysis stage (sec)	Average duration of data collection and analysis stage (sec)	Duration of target text creation stage (sec)	Average duration of target text creation stage (sec)	Duration of editing stage (sec)	Average duration of editing stage (sec)
6	356	356	3900	3900	420	420
7	480		3522		526	
7	390		3607		418	
7	465		3106		368	
7	617	488	2640	3219	256	392
8	472		3150		364	
8	469		3279		456	
8	536	492	2962	3130	304	375

Distribution of Students by the Mark and Duration of Each Stage after Training (academic year 2019/2020)

Mark after	Duration of data collection and analysis stage (sec)	Average duration of data collection and analysis stage (sec)	Duration of target text creation stage (sec)	Average duration of target text creation stage (sec)	Duration of editing stage (sec)	Average duration of editing stage (sec)
7	402		3200		418	
7	450		2900		506	
7	410	421	3180	3093	410	445
8	493		2880		345	
8	496		2886		352	
8	485	491	2960	2909	423	373
9	584		2608		248	
9	482	533	2436	2522	295	272

Mark after	Average data collection time (sec)	Data collection and analysis stage, %	Average target text creation time (sec)	Target text creation stage, %	Average editing time (sec)	Editing stage, %	Total
7	421	11	3093	78	455	11	3969
8	491	13	2909	77	373	10	3773
9	533	16	2522	76	272	8	3327

Distribution of Students by the Mark and the Total Time Spent (academic year 2019/2020)

Before training			During training			After training		
Mark	Total time (sec)	Average time (sec)	Mark	Total time (sec)	Average time (sec)	Mark	Total time (sec)	Average time (sec)
6	4967		6	4676	4676	7	4020	
6	4640	4804	7	4415		7	4000	
7	4600		7	4518		7	3856	3959
7	4208		7	3939	4269	8	3718	
7	4050		8	3986		8	3734	
7	4568	4357	7	4204		8	3868	3773
8	3748		8	3513		9	3440	
8	4087	3918	8	3802	3767	9	3213	3327

Students' Results of Translation Tasks (academic year 2019/2020)

	Before training		During training		After training	
Student	Weight of errors	Mark	Weight of errors	Mark	Weight of errors	Mark
Student 1	12	6	10	6	8	7
Student 2	9	7	9	7	8	7
Student 3	10	6	8	7	7	7
Student 4	7	7	6	7	5	8
Student 5	7	7	5	8	4	8
Student 6	5	8	4	8	3	9
Student 7	7	7	7	7	5	8
Student 8	4	8	4	8	3	9

Appendix 3: Data obtained from the translation process of translation tasks by the students (academic year 2022/2023, autumn semester)

Student	Duration of data collection and analysis stage (sec)			Duration of target text creation stage (sec)			Duration of editing stage (sec)		
	before	during	after	before	during	after	before	during	after
1	250	326	392	4115	3975	3251	503	433	507
2	397	494	446	3765	3504	2892	596	516	516
3	315	387	405	3878	3763	3083	432	399	390
4	505	549	512	2952	2318	1932	346	260	254
5	452	466	476	3146	3036	2566	378	336	347
6	762	626	517	2932	2932	2296	265	259	250
7	446	478	465	3391	3166	2778	494	452	374
8	516	534	470	3067	2963	2367	312	347	340
9	212	346	398	4278	4105	3732	446	442	438
10	208	398	412	4154	3912	3486	486	458	374
11	434	474	506	3245	3143	2915	392	314	318
12	496	517	502	3151	2895	2438	354	326	311
13	711	622	516	2737	2536	2304	258	252	249
14	551	568	517	3364	3026	2956	276	270	257
15	204	372	446	4599	4248	3738	202	297	265
16	231	349	516	4338	4115	3822	246	269	262
17	349	347	377	3968	3968	3492	391	391	316
18	468	495	466	3259	2977	2525	313	336	320
19	374	472	472	3807	3509	2676	507	517	403

Distribution of Students by the Mark and Duration of Each Stage before Training (academic year 2022/2023, autumn semester)

Mark	Duration of data collection and analysis stage (sec)	Average duration of data collection and analysis stage (sec)	Duration of target text creation stage (sec)	Average duration of target text creation stage (sec)	Duration of editing stage (sec)	Average duration of editing stage (sec)
5	204		4599		202	
5	231	218	4338	4469	246	224
6	208		4154		486	
6	212		4278		446	
6	250		4115		503	
6	315		3878		432	
6	349	267	3968	4079	391	452
7	374		3807		507	
7	397		3765		596	
7	434		3245		392	
7	446		3391		494	
7	452	421	3146	3471	378	473
8	468		3259		313	
8	496		3151		354	
8	505		2952		346	
8	516		3067		312	
8	551	507	3364	3159	276	320
9	711		2737		258	
9	762	737	2932	2835	265	262

Mark before	Average duration of data collection and analysis stage (sec)	Data collection and analysis stage, %	Average duration of target text creation stage (sec)	Target text creation stage, %	Average duration of editing stage (sec)	Editing stage, %	Total
5	218	4	4469	91	224	5	4911
6	267	6	4079	85	452	9	4798
7	421	10	3471	79	473	11	4365
8	507	13	3159	79	320	8	3986
9	737	19	2835	74	262	7	3834

Distribution of Students by the Mark and Duration of Each Stage during Training (academic year 2022/2023, autumn semester)

Mark during	Duration of data collection and analysis stage (sec)	Average duration of data collection and analysis stage (sec)	Duration of target text creation stage (sec)	Average duration of target text creation stage (sec)	Duration of editing stage (sec)	Average duration of editing stage (sec)
6	326		3975		433	
6	387		3763		399	
6	346		4105		442	
6	372		4248		297	
6	349		4115		269	
6	347	355	3968	4029	391	372
7	494		3504		516	
7	478		3166		452	
7	398		3912		458	
7	474		3143		314	
7	472	463	3509	3447	517	451
8	549		2318		260	
8	466		3036		336	
8	534		2963		347	
8	517		2895		326	
8	568		3026		270	
8	495	522	2977	2869	336	313
9	626		2932		259	
9	622	624	2536	2734	252	256

Mark during	Average duration of data collection and analysis stage (sec)	Data collection and analysis stage, %	Average duration of target text creation stage (sec)	Target text creation stage, %	Average duration of editing stage (sec)	Editing stage, %	Total
6	355	7	4029	85	372	8	4756
7	463	11	3447	79	451	10	4361
8	522	14	2869	77	313	9	3704
9	624	17	2734	76	256	7	3614

Distribution of Students by the Mark and Duration of Each Stage after Training (academic year 2022/2023, autumn semester)

Mark after	Duration of data collection and analysis stage (sec)	Average duration of data collection and analysis stage (sec)	Duration of target text creation stage (sec)	Average duration of target text creation stage (sec)	Duration of editing stage (sec)	Average duration of editing stage (sec)
6	516		3822		262	
6	377	447	3492	3657	316	289
7	392		3251		507	
7	446		2892		516	
7	405		3083		390	
7	398		3732		438	
7	412		3486		374	
7	446		3738		265	
7	472	424	2676	3265	403	413
8	512		1932		254	
8	476		2566		347	
8	465		2778		374	
8	470		2367		340	
8	506		2915		318	
8	502		2438		311	
8	517		2956		257	
8	466	489	2525	2560	320	315
9	517		2296		250	
9	516	517	2304	2300	249	250

Mark after	Average duration of data collection and analysis stage (sec)	Data collection and analysis stage, %	Average duration of target text creation stage (sec)	Target text creation stage, %	Average duration of editing stage (sec)	Editing stage, %	Total
6	447	10	3657	83	289	7	4393
7	424	10	3265	80	413	10	4102
8	489	15	2560	76	315	9	3364
9	517	17	2300	75	250	8	3067

Distribution of Students by the Mark and the Total Time Spent (academic year 2022/2023, autumn semester)

Before training			During training			After training		
Mark	Total time (sec)	Average time (sec)	Mark	Total time (sec)	Average time (sec)	Mark	Total time (sec)	Average time (sec)
5	5005		6	4734		6	4600	
5	4815	4910	6	4549		6	4185	4393
6	4868		6	4893		7	4150	
6	4625		6	4917		7	3854	
6	4936		6	4733		7	3878	
6	4848		6	4706	4755	7	4568	
6	4708	4797	7	4514		7	4272	
7	4758		7	4096		7	4449	
7	3976		7	4768		7	3551	4103
7	4331		7	3931		8	2698	
7	4071		7	4498	4361	8	3389	
7	4688	4365	8	3127		8	3617	
8	3803		8	3838		8	3177	
8	3895		8	3844		8	3739	
8	4001		8	3738		8	3251	
8	4191		8	3864		8	3730	
8	4040	3986	8	3808	3703	8	3311	3364
9	3959		9	3817		9	3063	
9	3706	3833	9	3410	3614	9	3069	3066

Results of Translation Tasks (academic year 2022/2023, autumn semester)

Student	Before training		During training		After training	
	Weight of errors	Mark	Weight of errors	Mark	Weight of errors	Mark
Student 1	11	6	10	6	8	7
Student 2	9	7	9	7	7	7
Student 3	10	6	10	6	8	7
Student 4	6	8	5	8	4	8
Student 5	7	7	6	8	4	8
Student 6	3	9	3	9	3	9
Student 7	8	7	7	7	6	8
Student 8	4	8	3	8	3	8
Student 9	12	6	10	6	9	7
Student 10	11	6	9	7	8	7
Student 11	9	7	8	7	6	8
Student 12	5	8	5	8	4	8
Student 13	3	9	3	9	2	9
Student 14	5	8	4	8	4	8
Student 15	14	5	10	6	9	7
Student 16	15	5	11	6	10	6
Student 17	12	6	12	6	11	6
Student 18	6	8	5	8	4	8
Student 19	9	7	8	7	7	7

Oksana Ivanova was born in 1981 in Gulbene. Oksana obtained professional higher education and qualification as a Technical Translator-Desk Officer at Riga Technical University in 2005. She completed RTU professional Master study programme "Technical Translation", obtaining a professional Master's degree in Technical Translation (2009). Oksana started her career at RTU in 2006 as an LSP (languages for specific purposes) lecturer and coordinator of the professional Bachelor study programme "Technical Translation". Since 2012, she has been a member of the Steering Committee of the International Scientific Conference "Meaning in Translation: Illusion of Precision". Over the past three years, she has been actively involved in scientific research activities, participating in such projects as "Language Technology Initiative", "Development of Efficient Governance of Riga Technical University", and "Support for RTU International Cooperation Projects in Research and Innovation". Her research interests include applied linguistics, specialised text translation, computer-assisted translation tools, language technologies, sustainability in higher education, and the design of e-learning environment.