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Machine Translation, Post-Editing, and Quality Assessment in English–Romanian Medical Translation: Insights from Professional Practice

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Abstract: The integration of machine translation (MT) and artificial intelligence into translation workflows has significantly transformed professional practice, particularly in high-stakes domains such as medical translation. This study investigates professional translators' perspectives on post-editing (PE) and translation quality assessment (TQA) in English–Romanian medical translation. Drawing on structured interviews and thematic analysis, the findings indicate that MT is primarily used as a support tool due to persistent issues related to terminology and contextual accuracy. Post-editing is considered essential, though often applied without structured adherence to standards such as ISO 18587, while TQA models are unevenly implemented in practice. The study also identifies a significant gap between academic training and professional requirements, particularly regarding technological and domain-specific competences. These findings highlight the need for a more integrated and practice-oriented approach to translator training in the Romanian context.

Keywords: medical translation; post-editing; translation quality assessment; machine translation; translator training

1. Introduction

In recent years, the rapid development of machine translation (MT), particularly neural machine translation (NMT), has reshaped the landscape of professional translation. While these technologies offer clear advantages in terms of speed and accessibility, they also introduce challenges, especially in specialized domains where accuracy is critical. Medical translation is one of the most demanding areas in this

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respect, requiring not only linguistic precision, but also terminological consistency and contextual adequacy. Even minor inaccuracies in medical texts may have serious consequences, affecting both professional communication and patient safety (Kovacs & Dejica 2025a).

Despite recent advances, the performance of NMT in medical translation remains uneven. Although output is often fluent, it may conceal issues such as omission, mistranslation, or inconsistency, particularly at the level of terminology and domain-specific meaning. As a result, MT cannot be used independently of post-editing (PE) and translation quality assessment (TQA) procedures, which ensure that translated texts meet the required communicative and professional standards (do Carmo et al. 2021; Hiebl & Gromann 2023).

Within this context, post-editing has become a key concept for understanding the interaction between automated systems and human intervention. Early discussions of post-editing already emphasized that it is not a uniform process, but involves different levels of intervention depending on the intended use and quality requirements of the translated text (Allen 2001). Formalized through standards such as ISO 18587:2017, PE is now understood as a structured process requiring specialized competences. In high-stakes domains such as medical translation, full post-editing is generally required to ensure both accuracy and usability (ISO 18587:2017; Nitzke & Hansen-Schirra 2021). At the same time, translation quality assessment has developed into a complex field encompassing both theoretical models and operational frameworks. While traditional approaches (Dejica and Stoian 2016) provide solid analytical foundations, and more recent models such as MQM and DQF allow for flexible evaluation, their implementation in professional contexts remains uneven (Manipuspika 2021; Kovacs & Dejica 2025a).

In the Romanian context, these challenges are compounded by limited integration of PE and TQA into academic curricula and professional practice, as well as by a lack of standardized methodologies (Dejica et al. 2022). Although hybrid approaches integrating MT, post-editing, and quality assessment have been proposed as viable solutions (Kovacs & Dejica 2025a; Kovacs & Dejica 2025b), empirical evidence regarding their practical use remains limited. In particular, there is insufficient insight into how professional translators engage with these frameworks and what competences they consider essential.

The present study addresses this gap by examining professional translators' perspectives on post-editing and translation quality assessment in English–Romanian medical translation. Drawing on qualitative data obtained through structured interviews, the article aims to provide insight into current practices, identify recurrent challenges, and highlight implications for translator education and research.

2. Theoretical and conceptual background

The analysis of post-editing and translation quality assessment in English–Romanian medical translation must be situated within the broader framework of translation studies, where issues of equivalence, quality, and professional practice intersect with

technological developments. Equivalence is understood not as formal correspondence, but as the accurate and contextually appropriate transfer of meaning between source and target texts (House 1997; Baker 2018). In medical translation, as a type of specialized translation (Dejica 2026), this requirement is particularly stringent, as communicative adequacy is closely linked to clarity, reliability, and safety. The emergence of machine translation has not diminished the importance of equivalence, but has redefined it within hybrid human–machine workflows.

Within this context, post-editing has become a key concept for understanding the interaction between automated systems and human intervention. Formalized through ISO 18587:2017, post-editing is viewed as a structured process aimed at improving the usability and accuracy of MT output, with a distinction between light and full post-editing (Nitzke & Hansen-Schirra 2021). In high-stakes domains such as medical translation, full post-editing is required to ensure terminological precision and contextual adequacy. At the same time, translation quality assessment has evolved into a multifaceted field encompassing both theoretical models and operational frameworks. Traditional approaches, such as those proposed by House and Waddington, provide a basis for systematic evaluation, while more recent models such as MQM and DQF allow for flexible, context-sensitive assessment (Manipuspika 2021; Kovacs & Dejica 2025b).

Despite these developments, the implementation of post-editing and quality assessment frameworks remains uneven, particularly in contexts where institutional support and training are limited. In the Romanian context, research has highlighted the insufficient integration of these approaches into academic programmes, the scarcity of domain-specific resources, and the reliance on individual rather than standardized practices (Dejica et al. 2022). Hybrid approaches combining machine translation, human post-editing, and structured quality assessment have been proposed as viable solutions, aiming to reconcile technological efficiency with professional requirements (do Carmo et al. 2021; Kovacs & Dejica 2025b).

Recent contributions have further expanded this perspective by examining the broader impact of digital technologies and artificial intelligence on translation practices and global communication. In particular, advances in localization and AI-driven processes have reshaped both workflows and translator competences, while also emphasizing the need to align pedagogical strategies with evolving professional demands (Mali & Dejica 2025a; Mali & Dejica 2025b; Grigoraș & Dejica 2025). Taken together, these developments highlight the need for a coherent framework that bridges theoretical models and real-world practices, and that supports the adaptation of translator training to ongoing transformations in the field.

3. Methodology

The present study adopts a qualitative research design with an exploratory orientation, aimed at investigating professional translators' perceptions and practices related to machine translation, post-editing, and translation quality assessment in the context of English–Romanian medical translation. This methodological choice reflects the

broader objective of complementing theoretical and standards-based approaches with empirical insight drawn from professional practice. As emphasized in previous research, the integration of qualitative inquiry into translation studies allows for a more nuanced understanding of decision-making processes, competences, and contextual constraints that cannot be fully captured through purely theoretical or quantitative models (Creswell and Plano Clark 2017; Hiebl & Gromann 2023).

3.1 Research design

Within the framework of this study, data collection was conducted through structured written interviews aimed at eliciting detailed responses regarding translators' professional experience, workflows, and attitudes toward MT, PE, and TQA. The interview-based approach is particularly suited to exploring complex and evolving practices, as it provides access to practitioners' reflective accounts and experiential knowledge. In line with earlier stages of the research project, which combined theoretical review, pilot surveys, and methodological refinement, the present phase focuses on capturing the professional dimension of translation activity, thus contributing to a more comprehensive research design that integrates conceptual, pedagogical, and empirical perspectives.

3.2 Data collection instrument

The data were collected using a structured interview protocol consisting of multiple sections addressing key areas relevant to the study, including professional background, translation quality assessment practices, use of MT and AI technologies, post-editing knowledge and strategies, risk management procedures, and perceptions regarding competences and training. This structure ensures alignment between the research questions and the empirical data collected, while also facilitating comparability across responses. The design of the instrument reflects established principles of survey and interview construction in translation studies, emphasizing clarity, accessibility, and conceptual coherence. Questions combine closed-ended elements, which allow for the identification of general trends, with open-ended prompts that encourage detailed explanations and illustrative examples. This mixed structure enables the collection of both descriptive and interpretive data, supporting a layered analysis of professional practices and perspectives.

3.3 Participants

The study draws on responses obtained from professional translators with varying levels of experience and expertise. The participants were recruited through a chain-referral (snowball) method, whereby initial contacts were asked to disseminate the interview to other practitioners within their professional networks. The resulting dataset includes translators with diverse profiles in terms of years of experience, language combinations, and areas of specialization, including medical, technical, legal, and other domains. While the number of participants remains limited, the sample provides insight into a range of professional perspectives, reflecting variation

in familiarity with MT tools, adoption of post-editing practices, and awareness of formal TQA models. Such diversity, despite the small scale of the dataset, contributes to the identification of recurrent patterns as well as contrasting approaches to translation and quality assurance.

3.4 Data analysis

The analysis of the interview data was conducted using a thematic approach, combining elements of qualitative content analysis with descriptive interpretation. Responses were examined systematically in order to identify recurring themes related to the central components of the study, namely the use of machine translation and AI tools, post-editing practices, translation quality assessment procedures, and perceptions of professional competences and training needs.

In the first stage of analysis, responses were grouped according to the main thematic areas defined by the structure of the interview. Within each category, patterns were identified based on frequency, consistency, and the degree of elaboration provided by participants. In the second stage, these patterns were interpreted in relation to the existing theoretical framework, allowing for a comparative analysis between professional practice and established models of PE and TQA. This dual approach—descriptive and interpretive—ensures both fidelity to the data and integration with the broader research context.

The analytical process also involved the selection of representative excerpts to illustrate key tendencies and support the interpretation of findings. Particular attention was given to instances where participants explicitly referred to challenges, strategies, or evaluative criteria, as these provide direct insight into the operationalization of translation practices in real-world contexts. Consistent with qualitative research principles, the aim was not to generalize statistically, but to identify meaningful patterns that contribute to understanding the current state of medical translation practice in the Romanian context.

3.5 Methodological considerations

Given the exploratory nature of the study, certain methodological limitations must be acknowledged. The relatively small number of participants and the reliance on self-reported data limit the generalizability of the findings. However, as noted in translation studies research, qualitative approaches are particularly valuable for generating in-depth insights and identifying emerging tendencies, which may subsequently inform larger-scale investigations. In addition, the use of written interviews, while facilitating flexibility and detailed responses, may result in varying degrees of elaboration across participants. Nevertheless, the consistency of themes observed in the dataset, combined with the alignment of findings with existing literature, suggests that the study provides a valid and informative contribution to the understanding of post-editing and translation quality assessment in English–Romanian medical translation.

4. Results and discussion

The analysis of the interview data reveals a nuanced and, at times, fragmented picture of professional practices related to machine translation, post-editing, and translation quality assessment in English–Romanian medical translation. While the small-scale nature of the dataset does not allow for statistical generalization, consistent patterns emerge across responses, offering valuable insight into current tendencies, recurrent challenges, and the broader relationship between theoretical models and professional workflows.

4.1 Use of Machine Translation and AI Tools

A consistent finding concerns the widespread adoption of machine translation and AI tools in professional practice, albeit accompanied by a high degree of caution. All respondents reported some level of engagement with MT or AI technologies, though their frequency and purpose vary significantly. In most cases, MT is not used as a primary translation tool, but rather as a support mechanism, particularly for tasks such as understanding complex source texts, generating initial drafts, or verifying lexical alternatives. The distribution presented in Figure 1 reflects the dominant usage patterns identified through qualitative coding of the responses; as such, the proportions illustrate general tendencies rather than strict numerical frequency counts.

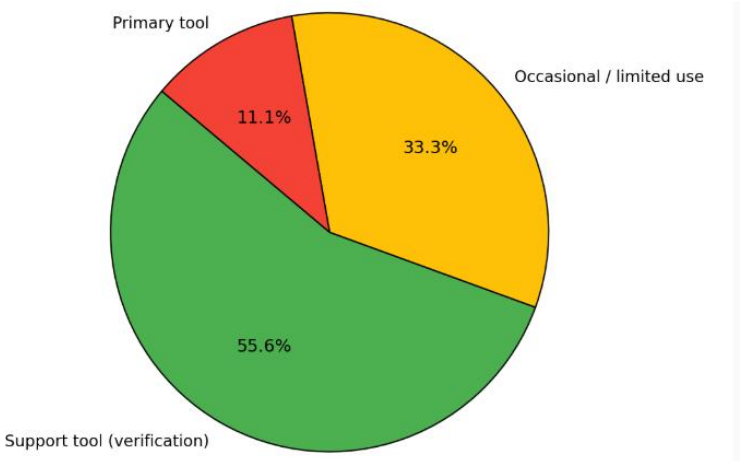

Figure 1. MT/AI Use in Professional Practice (N = 5)

As the chart suggests, the dominant approach is strategic and selective, with translators emphasizing the need for continuous verification. This finding aligns with previous research indicating that, despite improvements in fluency, NMT systems remain unreliable in specialized domains, particularly in relation to terminology and contextual accuracy (Kovacs & Dejica 2025a).

Moreover, respondents repeatedly highlight the risks associated with uncritical reliance on MT, noting that machine-generated output may introduce misleading or incomplete information. This perception is consistent with the literature, which emphasizes that the apparent coherence of NMT output may obscure deeper semantic errors, especially in medical contexts where precision is essential (do Carmo et al. 2021; Hiebl & Gromann 2023).

4.2 Post-Editing Practices and Error Patterns

Post-editing emerges as a central component of professional workflows, though its implementation varies depending on translators' experience, specialization, and familiarity with formal frameworks. While some participants explicitly refer to structured approaches, others describe more intuitive or experience-based procedures. In both cases, however, post-editing is perceived as indispensable for ensuring the quality of MT output. The analysis of reported error types reveals a high degree of consistency across responses. The most frequently mentioned issues include terminology errors, conceptual inaccuracies, and semantic mistranslations, followed by grammar and register-related inconsistencies.

This distribution is illustrated in Fig. 2. The proportions reflect qualitative coding of responses (dominant usage patterns), rather than strict numerical frequency counts.

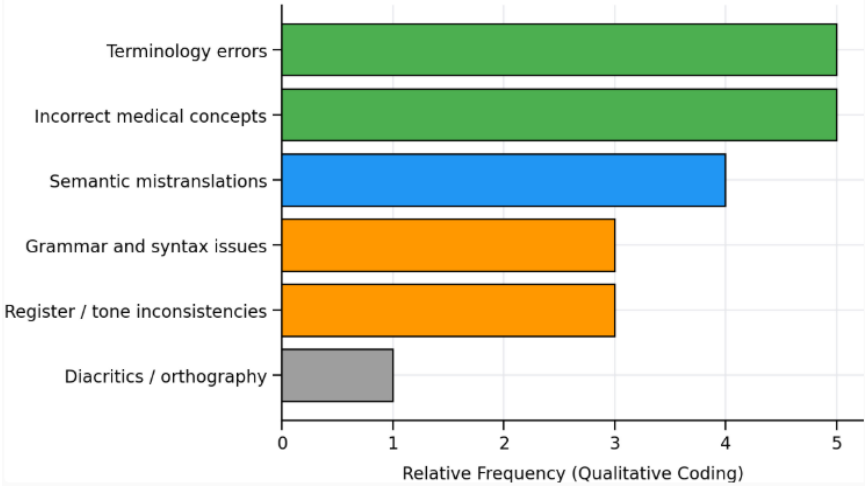

Figure 2. Most Frequent Error Types in MT Output (N=5)

The predominance of terminology and conceptual errors confirms earlier findings in the literature, which identify domain-specific vocabulary as one of the main weaknesses of MT systems in medical translation (Kovacs & Dejica 2025a). This is particularly significant given the high-stakes nature of medical texts, where incorrect terminology or dosage-related information may have serious consequences.

At the same time, the data suggest that post-editing is not limited to surface-level correction, but involves deeper cognitive processes, including cross-checking with reference materials, consulting specialized literature, and evaluating the appropriateness of the translation for the target audience. This observation reinforces the view that post-editing constitutes a complex interaction between human expertise and machine-generated output, rather than a simple revision step (Nitzke & Hansen-Schirra 2021).

4.3 Translation Quality Assessment in Practice

The findings related to TQA reveal a striking disparity between theoretical awareness and practical implementation. While some respondents demonstrate familiarity with established frameworks such as MQM, ATA, or Klaudy's transfer operations (2007), others report little or no knowledge of formal models. The distribution of TQA familiarity is represented in Fig. 3:

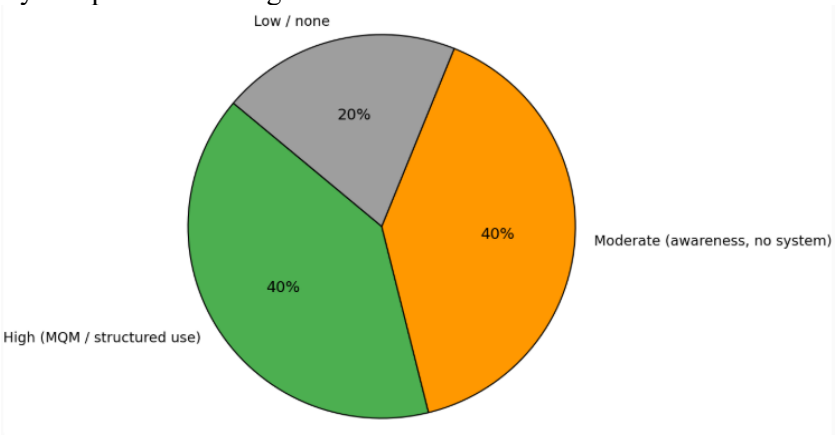

Figure 3. Familiarity with TQA Frameworks (N=5)

Even among those familiar with TQA models, their application tends to be selective and context-dependent. In some cases, MQM-based evaluation is integrated into professional workflows through error categorization and severity scoring. In others, assessment relies on implicit criteria such as accuracy, grammatical correctness, and audience appropriateness.

This finding confirms one of the central observations of previous research, namely that theoretical models of TQA, while well-developed, are not consistently operationalized in professional practice, particularly in contexts where time constraints and market pressures limit the feasibility of systematic evaluation (Manipuspika 2021; Kovacs & Dejica 2025a).

4.4 Competences and Training Gaps

Perhaps the most significant findings of the study concern translators' perceptions of competences and training needs. Respondents consistently emphasize the importance

of practical experience, domain knowledge, and familiarity with technological tools, while pointing to significant shortcomings in current educational programmes.

The key areas identified are summarized in Fig. 4, represented as a diverging bar chart. Positive and mirrored values illustrate relative importance based on qualitative coding of responses (dominant usage patterns), rather than strict numerical frequency counts.

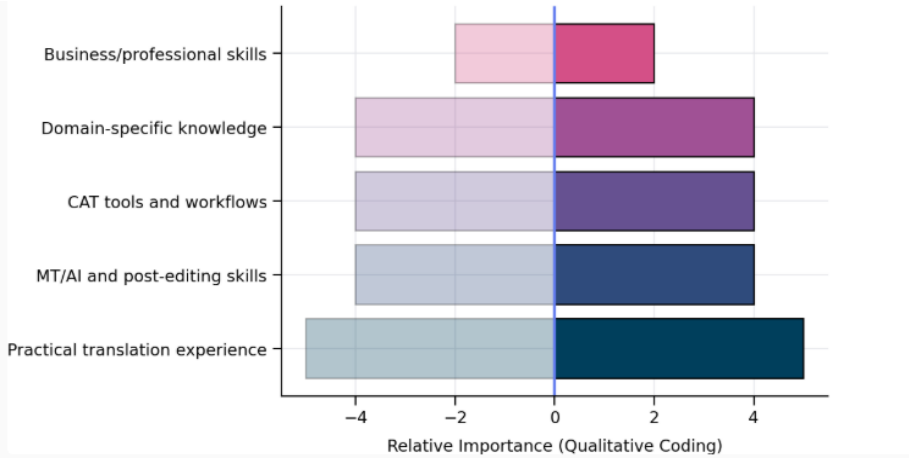

Figure 4. Perceived Training Needs (N=5)

A recurring theme is the perceived gap between academic training and professional practice. Participants note that graduates often lack sufficient exposure to real-world workflows, including the use of MT systems, post-editing techniques, and quality assessment procedures. This observation is consistent with previous analyses of the Romanian context, which highlight the limited integration of PE and TQA into translation curricula and the resulting mismatch between educational outcomes and industry expectations (Dejica et al. 2022).

Moreover, respondents stress the need for a stronger emphasis on comprehension and contextual analysis, suggesting that difficulties in understanding source texts remain a major obstacle even before the translation process begins. This highlights the continued relevance of core translation competences alongside technological skills, reinforcing the idea that automation does not eliminate the need for linguistic and interpretive expertise.

4.5 Bridging Academia and Professional Practice

The findings point to a broader structural issue, namely the persistent gap between academic models and professional practice in the Romanian translation context. While theoretical frameworks such as ISO 18587, MQM, and DQF provide a solid

foundation for understanding post-editing and quality assessment, their practical implementation remains uneven and often limited by contextual constraints.

At the same time, professional practice tends to prioritize efficiency, flexibility, and adaptability, often at the expense of systematic evaluation. This divergence does not necessarily reflect a rejection of theoretical models, but rather the need to adapt them to the realities of the translation market. As recent research has suggested, hybrid approaches that combine structured frameworks with context-sensitive application offer a promising direction for reconciling these perspectives (Kovacs & Dejica 2025b).

In this respect, the present findings reinforce the importance of integrating empirical insights into the development of translation theory and pedagogy. By examining how translators actually engage with MT, PE, and TQA in their daily work, it becomes possible to identify not only recurrent challenges, but also the conditions under which theoretical models can be effectively operationalized. This, in turn, provides a basis for more targeted interventions in both research and training, contributing to a more coherent and responsive framework for medical translation in the Romanian context.

5. Implications for Translator Training

The findings presented in the previous section highlight a number of structural and pedagogical challenges that have direct implications for translator training, particularly in the domain of English–Romanian medical translation. While the growing integration of machine translation and AI tools into professional workflows is widely acknowledged, the results of this study suggest that current educational frameworks have not yet fully adapted to these developments. This misalignment between academic preparation and professional requirements reinforces observations made in earlier research regarding the limited integration of post-editing and translation quality assessment into Romanian translation curricula (Dejica et al. 2022; Kovacs & Dejica 2025a).

One of the most salient implications concerns the need to reconceptualize translation competence in the context of technology-mediated workflows. As the data indicate, professional translators no longer operate solely as text producers, but increasingly as post-editors, evaluators, and decision-makers within hybrid human–machine environments. This shift requires the development of competences that extend beyond traditional linguistic abilities to include technological literacy, critical evaluation skills, and familiarity with MT systems. In line with ISO 18587:2017 and related frameworks, post-editing must be understood as a specialized activity requiring targeted training, rather than an intuitive extension of revision practices (Nitzke & Hansen-Schirra 2021).

Closely related to this is the need to integrate structured post-editing training into translation programmes. The findings show that, while post-editing is widely used in professional contexts, its practice is often shaped by individual experience rather than formal instruction. As a result, translators may rely on ad hoc strategies

that lack consistency and efficiency. Incorporating post-editing modules into curricula would allow students to engage systematically with different levels of intervention, to understand the specific requirements of light and full post-editing, and to develop strategies for dealing with recurrent MT errors, particularly in specialized domains such as medicine. Such training should be grounded in authentic materials and aligned with professional standards, ensuring that students are exposed to realistic scenarios and workflows.

A further implication concerns the role of translation quality assessment in translator training. The study reveals a significant gap between familiarity with TQA models and their practical application, suggesting that current pedagogical approaches do not sufficiently emphasize systematic evaluation. While traditional models such as those proposed by House or Waddington provide valuable theoretical foundations, their operationalization in classroom settings remains limited. At the same time, more recent frameworks such as MQM and DQF, which are widely used in the industry, are not consistently integrated into educational programmes. As previous research has shown, the absence of structured assessment criteria leads to variability in feedback and limits students' ability to develop a coherent understanding of translation quality (Manipuspika 2021; Kovacs & Dejica 2025a).

In this context, translator training should move towards a more explicit and systematic use of TQA frameworks. This involves not only introducing students to different models, but also enabling them to apply these models in practice through error annotation, peer review, and reflective evaluation tasks. By engaging with structured assessment tools, students can develop a more refined awareness of translation quality and a clearer understanding of the criteria that underpin professional evaluation. At the same time, the integration of TQA into assessment practices would align academic evaluation with industry standards, contributing to a more transparent and consistent approach to grading and feedback.

The results of the study also underscore the importance of strengthening domain-specific competence, particularly in medical translation. As respondents consistently emphasize, many of the difficulties encountered in practice stem from inadequate understanding of source texts and insufficient familiarity with specialized terminology. This observation confirms the findings of previous research, which highlights the complexity of medical translation and the need for interdisciplinary knowledge that combines linguistic, terminological, and contextual expertise (Kovacs & Dejica 2025a). Translator training programmes must therefore incorporate specialized modules that focus on medical discourse, genre conventions, and terminology management, enabling students to engage effectively with high-stakes texts.

In addition to linguistic and technical competences, the study points to the growing importance of professional and organisational skills. Respondents emphasize the need for familiarity with CAT tools, translation workflows, and project management practices, as well as an understanding of market expectations and client requirements. These aspects are often underrepresented in traditional curricula, yet

they play a crucial role in shaping professional success. As previous work has shown, the integration of workflow-oriented training and technology-driven practices is essential for preparing students to operate effectively in contemporary translation environments (Kovacs & Dejica 2025b).

Finally, the findings highlight the need to bridge the gap between academia and professional practice through closer collaboration and curriculum alignment. The persistent mismatch between training and industry requirements suggests that educational institutions must engage more actively with the professional community, incorporating feedback from practitioners and adapting teaching practices accordingly. This may involve the use of industry-based case studies, collaborative projects, internships, and guest lectures, as well as the development of partnerships between universities and translation service providers. By fostering such connections, translator training can become more responsive, dynamic, and relevant to the realities of the profession.

In sum, the implications of this study point towards a reorientation of translator training that reflects the evolving nature of translation practice. The integration of post-editing, translation quality assessment, and technology-mediated workflows into educational programmes is no longer optional, but necessary for ensuring that future translators are equipped with the competences required in a rapidly changing professional landscape. By aligning pedagogical approaches with both international standards and empirical insights, Romanian translation studies can contribute to the development of a more coherent and effective model of translator training, particularly in specialized domains such as medical translation.

6. Conclusion

The present study has examined the role of machine translation, post-editing, and translation quality assessment in English–Romanian medical translation, with a particular focus on professional practices and their implications for translator training. By combining a theoretical and conceptual framework with empirical data drawn from professional translators, the analysis has provided insight into how translation workflows are currently shaped by the interplay between technological tools and human expertise.

The findings confirm that machine translation, although widely adopted in professional contexts, remains a support tool rather than a fully reliable solution in professionally sensitive domains such as medical translation. Translators consistently emphasize the need for careful verification, domain knowledge, and critical evaluation of MT output, particularly in relation to terminology and contextual accuracy. These observations are in line with previous research highlighting the limitations of NMT systems in specialized settings and the necessity of human intervention to ensure communicative adequacy and safety (Kovacs & Dejica 2025a; do Carmo et al. 2021).

At the same time, post-editing emerges as a central and indispensable component of contemporary translation practice. However, its implementation is

often shaped by individual experience rather than by systematic application of established frameworks such as ISO 18587:2017. Similarly, while translation quality assessment is recognized as essential, its practical application remains uneven, with many translators relying on implicit criteria or partial adoption of formal models. This divergence between theoretical frameworks and professional practice reflects broader trends identified in the Romanian context, where the integration of PE and TQA into academic and institutional structures remains limited (Dejica et al. 2022; Kovacs & Dejica 2025a).

One of the most significant contributions of this study lies in its identification of persistent mismatches between translator training and professional requirements. The data clearly indicate that current educational programmes do not sufficiently prepare graduates for the realities of technology-mediated workflows, particularly in relation to MT usage, post-editing competences, and structured quality assessment. This underscores the need for a reorientation of translator training that integrates technological, linguistic, and professional competences into a coherent curriculum aligned with both international standards and industry practices.

The study also highlights the importance of domain-specific knowledge, particularly in medical translation, where understanding of terminology, genre conventions, and contextual meaning plays a crucial role in ensuring translation quality. In this respect, the findings reinforce the view that technological tools do not replace core translation competences, but rather transform the conditions under which these competences must be applied. This perspective is consistent with earlier research emphasizing the importance of efficient and well-structured translation workflows as a key factor in ensuring quality and professional performance in dynamic market environments (Pașcalău & Dejica 2021).

At an institutional level, the present study contributes directly to the ongoing reform of translator training at the Politehnica University of Timișoara. Continuing earlier efforts to integrate electronic tools and computer-assisted translation into the curriculum (Dejica-Cartis 2012), the recommendations formulated in this paper will be systematically implemented within the BA and MA translation programmes. This includes the consolidation of post-editing training, the integration of structured translation quality assessment models, and the expansion of technology-oriented course components. In this respect, the study does not merely document professional practices, but actively supports the transition from theoretical frameworks to curriculum design aligned with contemporary market demands.

Despite its contributions, the study has several limitations that must be acknowledged. First, the number of participants is relatively small, which restricts the representativeness of the findings and limits the possibility of generalizing results to the wider population of professional translators. Second, the data are based on self-reported responses, which may be influenced by individual perceptions and professional positioning. Third, the study focuses exclusively on the English–Romanian language pair and on medical translation, which, while highly relevant, represents only one segment of the broader field of specialized translation. These

limitations suggest directions for future research, including larger-scale studies, comparative analyses across language pairs and domains, and the integration of observational or experimental data.

In conclusion, the study contributes to the growing body of research on technology-mediated translation by providing empirical insight into the practical realities of post-editing and translation quality assessment in medical translation. By situating these findings within the broader theoretical and methodological framework of translation studies, it underscores the need for a more integrated and context-sensitive approach to translator training, research, and professional practice. In the Romanian context, such an approach is essential for bridging the gap between conceptual developments and applied training, and for ensuring the development of translation competences that are both academically grounded and professionally relevant.

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