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The Impact of Translation Technology on Enhancing English Majors' Translation Competence: A Study within the PACTE Framework

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Abstract: *The acquisition of translation competence constitutes a pivotal aptitude for English language learners, encompassing both receptive and productive linguistic capabilities. It is acknowledged that translation competence is multifaceted, integrating a spectrum of skills. This research primarily concentrates on the development of instrumental competence within the PACTE's proposed translation competence framework, utilizing specialized courses in translation technology. It subsequently examines the cascading influence of this particular competence on overarching translation abilities. The study reveals that the enhancement of this core competence concurrently leads to the improvement of other sub-competences. Consequently, the approach to bolstering translation competence entails not only the augmentation of specific translational knowledge but also a holistic and methodical attention to a spectrum of sub-competencies.*

Keywords: *translation competence, translation technology, PACTE framework, instrumental competence*

1. Introduction

Researchers have categorized and divided translation competence in various ways. For instance, Janet Fraser [2] proposed that the translation competence of professional translators includes language skills, discourse skills, and the application of translation theory; the PACTE model of translation competence consists of bilingual sub-competence, extra-linguistic sub-competence, knowledge about translation sub-competence, instrumental sub-competence, strategic sub-competence [6]. In recent years, scholars have proposed a symbiotic relationship between translators and technology, with human-computer collaboration becoming an irreversible trend in the modern translation industry[8]. Translation tool competence belongs to a non-linguistic ability. A real translation task should start with the acquisition of a corpus, followed by analysis of the translated original, and also embrace pre-translation and terminology finding [9]. Students should not only scratch the surface of information retrieval but also understand its principles, types, and characteristics [1]. The creation of a corpus greatly facilitates access to a vast amount of linguistic data. Students are expected to use corpora to enhance the appropriateness of their translations and understand how corpora are constructed [5]. Thus, this study not only aims to emphasize the necessity of the translation tool sub-competence but also focuses on the coordinated development among various competences of the PACTE model, promoting a harmonious relationship.

English majors possess comprehensive English knowledge and anopen-mindedness for cross-cultural communication. According to the PACTE, instrumental sub-competence requires students to understand the characteristics of various translation technologies [7], assess the quality of translation tools, and flexibly use various translation platforms and technological tools. Currently, some translation colleges have established teaching activities for modern translation technologies, but the teaching focus often remains on the use of basic computer tools without enhancing the underlying significance of the instrumental sub-competence [4]. However, the importance of this translation competence is vague in the current translation market, nor is it well-implemented in translation classroom activities[3]. When it comes to all sub-competences of translation, though recognizing the importance, Chinese-English translator trainers never attach it to their training practice [10].

Therefore, this study has a certain reference value for the research of various translation sub-competences and their interconnections. This research provides practical learning strategies for

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English majors to enhance their translation skills by emphasizing the influence of instrumental sub-competence on other areas. It also highlights the importance of teaching modern translation technology, considering the evolving translation market demands, and nurturing translation talent to adapt to technological advancements.

2.Research design

2.1 Research object and sample selection

To assess the translation competence of the participants, the researchers employed the 2021 China Accreditation Test for Translators and Interpreters (CATTI) Level 3 examination as the evaluation material. Administered by the China International Publishing Group (CIPG), CATTI is widely regarded as a reliable assessment tool for translation professionals and plays a crucial role in regulating the translation market. The utilization of this standardized examination ensures the objectivity and scientific validity of the assessment process.

The selection process involved distributing examination papers to English major students, from which 36 participants were chosen based on their test results. These individuals achieved scores ranging from 60 to 80 in both subjects of the CATTI Level 3 examination, indicating a certain level of translation knowledge and theoretical understanding. However, there is still room for improvement in their translation skills. After the aforementioned screening process, the participants selected for this study are English major students whose translation competence is roughly at the same level.

2.2 Research procedures

This study utilizes micro-lessons delivered through an online course platform. The course comprises five main modules: information retrieval, computer basics, corpus construction, collaborative translation tools, and post-translation editing. Each module addresses specific aspects such as background knowledge, fixed collocations, professional expressions, proper nouns, and bilingual examples. The course emphasizes the importance of information retrieval skills and understanding corpus construction for effective translation. During the experiment, 36 participants were asked to regularly read and study materials and fulfill assigned exercise tasks. Upon completion of the learning tasks, all participants were given a questionnaire, and the results were collected and analyzed.

2.3 Data collection and analysis methods

This study involved 36 students in an online course platform aimed at improving their instrumental sub-competence in using translation tools. To assess changes in their translation sub-competence, a questionnaire was administered after the completion of all online courses. The questionnaire evaluated the instrumental sub-competence across three dimensions: attitudes towards translation technology, using translation technology, and knowledge about translation technology. Participants responded on a five-point Likert scale, ranging from "very conform" to "not at all" with corresponding scores of 5 to 1, respectively. The structure of the questionnaire is outlined in Table 1. The questionnaires were distributed and collected using an online survey platform.

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Table 1: Questionnaire on Learning Modern Translation Technology and its Impact on Translation Competence

Question	Type	Content
1. Is human translation the primary mode used, with computer-aided translation used as a supplementary tool?	single option	translation mode
2. Do you believe that translation technology is a means for translators to showcase their inherent skills and strengths?	scale	views on translation technology
3. Do you believe that understanding modern translation technology and tools is an inevitable requirement for translators in the current era?	scale	views on translation technology
4. Have you become proficient in using certain modern translation technologies and adopted a tool-assisted translation approach?	scale	using translation technology
5. Do you regularly update your knowledge of modern translation technology and consciously put them into translation practices?	scale	using translation technology
6. Are you familiar with the features of leading modern translation technologies such as SDL Trados and memoQ?	scale	knowledge about translation technology
7. Do you have a clear understanding of which types of translation technology to use in different stages of a translation project (pre-translation, while-translation, post-translation)?	scale	knowledge about translation technology
8. Can you detect linguistic intentions in both formal and informal situations?	scale	bilingual sub-competence
9. Can you perceive subtle differences in attitude between different forms of expression?	scale	bilingual sub-competence
10. Do you choose appropriate language and phrasing when conveying your own opinions?	scale	bilingual sub-competence
11. Please select the “very conform” option.	single option	polygraph
12. Do you have a basic understanding of political, economic, cultural, and ideological issues both domestically and abroad?	scale	extra-linguistic sub-competence
13. When encountering cultural similarities and conflicts, do you analyze the problem from multiple perspectives?	scale	extra-linguistic sub-competence
14. Are you tolerant of different values, dietary habits, taboos, etc.?	scale	extra-linguistic sub-competence
15. Do you follow the steps of pre-translation research, post-translation evaluation, modification, and refinement?	scale	knowledge about translation sub-competence
16. Do you select appropriate language forms based on the source text type and target readership?	scale	knowledge about translation sub-competence
17. Do you have an understanding of the translation market and its specific trends, and can plan your translation career accordingly?	scale	knowledge about translation sub-competence
18. When reflecting on translation errors, do you identify your own subjective shortcomings or external factors that influenced the outcome?	scale	strategic sub-competence
19. Do you integrate translation knowledge in a timely manner, summarize translation experience, and form a clear network structure to guide the translation process?	scale	strategic sub-competence
20. Do you identify different translation objects and select appropriate methods to master new knowledge based on your own learning situation?	scale	strategic sub-competence

3. Data analysis

The questionnaire analysis revealed that 28 out of 36 samples were valid after excluding 8 that failed answer the polygraph question. Responses were almost evenly split between human-rendering (46.4%) and machine-rendering (53.6%) translation modes. The overall standardized reliability coefficient for the questionnaire, measuring the impact of learning about modern translation technology, was 0.944, indicating high reliability. This high reliability extends to four other sub-competences related to translation technology learning.

The results of the exploratory factor analysis, with a Kaiser-Meyer-Olkin (KMO) measure of 0.719, indicate a good level of sampling adequacy for the questionnaire. Additionally, the near-zero significance of the revision test supports the rejection of the null hypothesis, further validating the questionnaire's effectiveness.

Participants in a questionnaire on translation technology learning were divided into high, medium, and low-performing groups based on their scores, with each group representing a third of the score distribution. This allowed for a comparative analysis of their attitudes and knowledge across different aspects of translation technology. The high-performing group showed more balanced and higher scores in areas like views, usage, and knowledge of translation technology. However, across all groups, the scores for “knowledge about translation technology” were consistently lower compared to the other dimensions. The analysis of scores in modern translation technology sub-competences reveals that the high-performing group significantly outperforms the middle and low groups in all four

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sub-competences, indicating their superior overall quality. Notably, the "knowledge about translation" sub-competence scored the lowest among the four, suggesting a weaker proficiency in specific translation knowledge domains. In contrast, there was a more balanced expertise distribution in the bilingual, extra-linguistic, and strategic sub-competences.

The independent samples t-test showed that the p-value for differences in views on translation technology between translation modes was 0.552, exceeding the significance level of 0.05. This suggests no significant difference in perceptions of translation technology across different translation modes. Additionally, no significant differences were found in usage, knowledge, and various sub-competences of translation technology based on translation mode, leading to the non-rejection of the null hypothesis. Also, the independent samples t-test shows significant differences in translation sub-competences between high and low-performing groups in translation technology. There is a notable difference in bilingual sub-competence, with a p-value of 0.001, well below the 0.05 significance level, indicating significant variation between high and low performers. Similar significant disparities are found in extra-linguistic, knowledge about translation, and strategic sub-competences, demonstrating that proficiency levels in translation technology significantly affect these specific sub-competence areas.

The correlation analysis indicates positive correlations among all variables, with coefficients greater than 0. A strong positive correlation exists between translation technology knowledge and bilingual sub-competence (coefficient: 0.696). Other variables also show positive correlations. However, the correlations between views on translation technology and extra-linguistic sub-competence (coefficient: 0.362), and between views on translation technology and knowledge about translation sub-competence (coefficient: 0.308), are relatively weak.

In the analysis of regression models concerning translation technology learning's impact on various sub-competences, distinct patterns emerge across different performance groups. For bilingual sub-competence, the high-performing group's model shows a strong correlation (R^2=0.838>0.8), indicating that knowledge of translation technology significantly influences this sub-competence (β=0.658, P=0.016). However, the views and usage of translation technology do not significantly impact it. In contrast, the low-performing group displays a good model fit but no significant influence from any variables. The intermediate group is unique, as all variables—views, usage, and knowledge—positively and significantly affect bilingual sub-competence. Regarding extra-linguistic sub-competence, both high-performing (R^2=0.448>0.4) and intermediate (R^2=0.519>0.5) groups' models reflect the impact of translation technology, but none of the variables significantly affect this sub-competence (P>0.05). This suggests a lack of strong influence of translation technology variables on extra-linguistic sub-competence. In the context of knowledge about translation sub-competence, the regression models for both low-performing (R^2=0.301>0.3) and intermediate (R^2=0.421>0.4) groups show no significant impact from translation technology variables (P>0.05), indicating a weak connection between these aspects and knowledge about translation. However, the strategic sub-competence models for the high-performing (R^2=0.486) and intermediate (R^2=0.676) groups demonstrate significant impacts. Particularly in the intermediate group, the model is statistically significant (F=4.859, p<0.05), with translation technology usage (β=0.730, p=0.015) and knowledge (β=0.889, p=0.017) identified as key influencers. Throughout these models, the absence of multicollinearity (VIF < 5) confirms the reliability of the analyses.

4. Discussion and conclusion

The research on the translation sub-competence of students specializing in English reveals that preferences for either human translation or computer-assisted translation do not markedly influence their overall translation ability. Empirical data gleaned from a questionnaire indicates a positive correlation between proficiency in contemporary translation tools and general translation competence, suggesting that the educational context of the participants fosters the development of translation proficiency.

In exploring the various aspects of translation technology education, it was observed that participants with high levels of competence exhibited a more balanced proficiency across different facets such as conceptual understanding, practical application, and technological knowledge. Conversely, participants with lower levels of competence displayed a disproportionate mastery of these elements, particularly noting a deficiency in the technological knowledge domain. This imbalance underscores the novelty of translation technology in the curriculum for English language students and

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suggests a need for enhanced focus on this area. Additionally, the investigation did not find significant correlations between attitudes towards translation technology and extra-linguistic or translation-specific knowledge sub-competences. This could imply that the integration of modern translation technology is not yet sufficiently impactful on broader cultural knowledge and specialized translation knowledge. However, within the group with higher competence, a clear influence of translation technology knowledge on bilingual sub-competence was noted, indicating that greater technological familiarity correlates with improved bilingual abilities.

In the current digital era, it is practical for translators to utilize a blend of human and machine translation, adapting tools to human-centric workflows. The choice of translation method is subjective and does not appear to substantially affect translation competence, supporting the notion that translators should not be confined to a single method but rather employ a contextual approach to each task.

Further, as learning levels are positively associated with the development of competence, translators can enhance their proficiency through targeted learning strategies, particularly in areas where their knowledge is lacking. Practical engagement with translation projects serves as a vehicle for learning translation technology, with technology selection being informed by the nature of the source material. Through such applied learning, translators consolidate language knowledge and improve their bilingual competences.

Ultimately, the study posits that the strategic application of modern translation technology, informed by theoretical understanding and active practice, can enhance a translator's adaptability and innovation in deploying various competences. However, limitations of the study include a small sample size, a narrow selection of course materials, and a lack of stringent academic environment, which may have influenced generalizability and accuracy of the research findings.

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