

# Assessment of Translation Competence Development Needs of Foreign Language Majors at Guangxi University of Foreign Languages

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**Abstract:** This study investigated the translation competence (TC) development needs of foreign language majors at Guangxi University of Foreign Languages (GUFL) amid the AI-driven transformation of the translation industry. Employing a quantitative approach, the study administered a questionnaire to a sample of 359 students, with data analyzed via SPSS for descriptive statistics, correlation, and gap analysis. The research identified ten TC dimensions: Strategic Competence (SC), Critical Thinking (CT), Language Competence (LC), Intercultural Competence (IC), Translation Knowledge (TK), Thematic Competence (ThC), Technology Competence (TechC), Personal Competence (PC), Interpersonal Competence (IpC), and Project Management Competence (PMC). Results revealed significant gaps between current and expected levels of TC across all dimensions ( $p < 0.001$ ), with the largest disparities observed in LC and SC. Correlation analysis demonstrated strong interdependencies among all dimensions, and CT emerges as a central connector linking SC, LC, and IC. CT also showed strong correlations with TK, ThC, TechC, and PMC, and moderate correlations with PC and IpC. The findings validated the holistic nature of TC and highlighted the urgency to integrate human-centric communication with digital literacy in translator training. Based on empirical survey results and relevant theories, an Integrated Digital and Human Communication Platform is proposed to address the needs of TC development. The study enriched the literature on TC models and provided valuable insights for translation education.

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## **Introduction**

**A**S ARTIFICIAL INTELLIGENCE (AI) technologies continue to evolve, the translation capabilities of AI and machine translation (MT), most of which now incorporate large language models, have been tremendously enhanced. As a result, the translation industry has undergone a transition to the modality of human translators collaborating with AI, MT, or computer-assisted translation (CAT) systems. New dynamics require translators to renew their skills in the new technological landscape. However, evidence shows that translator skills, developed under the current training programs, fall short of the requirements of language service markets (Al-Batineh & Al Tenaijy, 2024). This makes educators rethink the abilities that a human translator should have and how to cultivate them. Chinese scholars emphasize the cultivation of technology competencies and post-editing skills in translators (Mou, 2022; Zhu & Guan, 2019; Xu & Hu, 2022). The importance of higher-order cognitive skills is stressed by researchers (O’Dea, 2024; Chiu, 2024), and competencies of a translator and factors affecting student translators’ performance in a human-machine cooperation context are revisited and discussed (Prieto Ramos, 2024; Yang & Wang, 2023). Above all, the key competences of a human translator from an industry-oriented perspective, as well as goals and methods of translator training, shall be re-examined (Prieto Ramos, 2024).

Although existing studies have examined translation competence (TC) models in relation to linguistic, cultural, technological, and strategic dimensions (PACTE, 2003; EMT, 2022; Prieto Ramos, 2024), several important gaps remain, which deserve closer attention. First, much of the literature has been conceptual or based on the perspectives of professional translators, with limited empirical data of undergraduate students from regional Chinese universities, such as Guangxi University of Foreign Languages (GUFL). Second, although scholars increasingly emphasize the importance of technology competence and post-editing skills in the AI era (Mou, 2022; Al-Batineh & Al Tenaijy, 2024), few studies have taken a comprehensive look at the comparison between students’ current abilities and their aspirations across the full spectrum of TC dimensions. Third, the interplay of higher-order cognitive skills, particularly critical thinking, with strategic and intercultural competences in AI-driven translation contexts has not been sufficiently addressed (Darwin et al., 2023; Yang & Wang, 2023). Finally, explorations of how human communication and digital literacy can be effectively integrated into a unified teaching model remain scarce, despite increasing calls for curriculum reform to prepare translators for hybrid human–AI environments (Abu-Rayyash, 2023; Mah & Groß, 2024). This study seeks to bridge these gaps by providing empirical evidence on GUFL

students' TC development needs and by proposing an integrated human and digital communication platform tailored to the challenges of the AI era.

## Research Questions

In order to provide relevant insights for translation competence development for language teaching in GUFL, this article proposes the following research questions:

1. What are the current and expected levels and gaps of TC in foreign language majors in GUFL?
2. What are the relationships among the identified dimensions of TC, based on the data on the current level of TC of foreign language majors in GUFL?
3. What should be an appropriate teaching model for TC development in GUFL? Shall this model be integrated, emphasizing both human and digital communication?

## Research Objectives

The present research is to provide evidence for building an appropriate model for TC development in GUFL students. The objectives include:

1. To examine the current and expected levels and gaps in TC among foreign language majors in GUFL.
2. To analyze the correlations between the dimensions of TC, based on the data on the current level of TC of foreign language majors in GUFL.
3. To propose suggestions for building an integrated human and digital communication model for TC training, appropriate in the context of GUFL.

## Literature Review

### *The Role of AI in the Translation Industry*

According to the UK Language Services Industry Survey and Report 2023 (ATC, 2023), technologies play a fundamental role in delivering translation services, with the translation management system and MT at the top of the

list. Given the wide variety of technologies used by language service companies, developing technological and digital expertise is no longer optional for human translators. Similarly, data in the 2023 China Translation and Language Services Industry Development Report (TAC, 2024) reveals that MT technology has posed a profound impact on the industry. Statistics show that 90.1% of translation and language service businesses in China believed that adopting the “machine translation + post-translation editing” model improved efficiency, of which 24.2% stated that it “greatly improved efficiency” and 65.9% said it “improved efficiency to some extent”. The “machine translation + post-editing” production model greatly improves work efficiency, thus creating more room for increasing business volume and enhancing market competitiveness. Translation services for overseas travel, localization of e-commerce websites with a huge amount of information, and instant translation of social media information are likely to grow rapidly with the maturity of MT technology.

The European Language Industry Survey 2024 (ELIS, 2024) reveals that the most widely adopted technologies in the field are CAT tools and translation management systems, followed by MT and terminology management. Among independent professionals, AI tops the list both in terms of first-time adoption and planned investment. MT has now become “a standard part of professional translation work” (ELIS, 2024: 31). In contrast, technology implementation among university staff has not increased compared to the 2023 level.

Currently, AI models are widely applied in the translation process for searching information, providing translation solutions, and even producing translations together with CAT tools. As the quality of AI translation improves, there is no doubt that the market will perpetuate the working modality of “AI translation+ (human) post-editing.” What qualities or competences a human translator should possess in order not to be displaced by the machine and continue to play a significant role in the translation industry is a question warranting more thorough research for the purpose of giving deeper insights into how higher education can equip the future translators with essential competences in this AI empowered world.

### ***Key Competences of Human Translators***

Linguistic, cultural, and thematic competences are the most recognized aspects in existing TC models and are regarded as the most relevant competences for a translator (Neubert, 1994; Kiraly, 1995; PACTE, 2003;

Göpferich, 2009; EMT, 2022). In the PACTE model, strategic competence is considered the core competence that relates to and coordinates other competences in the process of translation. A survey by Prieto Ramos (2024) further confirmed that language competence, strategic competence, and thematic and cultural competence were ranked highest by professional translators in terms of their relevance to ensuring legal and institutional translation quality. This indicates that, even in the context of AI era, these basic competences remain crucial.

Translation competence theories recognize the significance of a translator's ability to use tools. This capacity for tool use in a broader sense is represented by various descriptors in the models proposed by Göpferich (2009), PACTE (Albir, 2017), EMT (2022), and Prieto Ramos (2024). Referred to as tools and research competence, instrumental competence or technology competence (tools and application), it encompasses the use of a wide range of important tools, such as the computer, communication and linguistic tools, corpora, translation tools and so on. The PACTE Group (2009) highlights "instrumental competence" as essential, defining it as the "procedural knowledge related to the use of documentation resources and information and communication technologies in translation." Similarly, Göpferich (2009: 21) describes "tools and research competence" as the ability to use both conventional and electronic tools specific to translation, considering it one of the three key sub-competences for translators. In other models, this competence is called technology competence. In ISO 17100 (ISO, 2015), technology competence encompasses the knowledge, ability and skills in employing technical resources, tools and IT systems for performing the technical tasks in the translation process. The European Master's in Translation Competence Framework 2017 provides a more contemporary definition of this competence: "all the knowledge and skills required to utilize current and future translation technologies within the translation process," which includes basic knowledge of MT technologies and the ability to apply them as needed (EMT, 2017: 9).

In the pre-AI era, instrumental competence or technology competence was mainly about the application of tools, with humans acting as the principal translators. As AI grows increasingly intelligent and capable of completing large volumes of translation work efficiently, there is increased academic discourse focusing on the relationship between human and digital translators. Within the context of human-machine collaboration, the role of human translators in ensuring high quality translation remains highly valued, especially when addressing cross-cultural and literary texts. AI is not without limitations. Its downsides, such as a lack of personalization, the potential for echo chambers, and difficulties in nuanced understanding may result in translations that embody cultural or political inaccuracies or misunderstandings. AI has difficulties in "capturing the intricate dance of

emotions, cultural subtleties, and layered meanings” (Abu-Rayyash, 2023), especially in translating subjective texts such as cultural and literary ones, which is echoed by other studies (Khoshafah, 2023; Škobo & Petričević, 2023). In a word, language competence and intercultural competence of human translators are still essential to ensuring successful communication across cultures.

Furthermore, critical thinking, professional ethics and attitudes are crucial to a translator’s success in the translation market. AI is like a double-edged sword. When carefully used, it can help improve students’ critical thinking competences including self-regulated learning and analytical skills. However, evidence from many studies also shows that over-reliance on AI may lead to superficial understanding and a decline in critical thinking (Panit & Naneta., 2025; Darwin et al. 2023; Sardi et al., 2025), which suggests that it is essential for students to learn to use AI technologies in a cautious manner. According to Darwin et al. (2023), critical thinking is the overriding competence of human translators, especially in the AI era. Translation ethics are also an important component of TC in the AI era (Xu & Hu, 2022), helping foster self-discipline and avoid the misuse of technology, a necessary step towards enabling new generations to act critically and professionally (Ramírez-Polo & Vargas-Sierra, 2023).

Froeliger et al. (2022) question whether certain descriptors under the Service Provision in the EMT framework, such as “the ability to meet market demands, as well as managing client relationships and negotiations” (EMT, 2022), are essential components of translation training. They argue that unless the future translators wish to be freelancers, such an ability should not be considered one of the core competences in the higher education curricula. On the other hand, they contend that the ability to maintain client relationships and negotiate successfully with clients is part of the interpersonal competence that could affect the long-term development of a translator. As supported by Salamah (2022), employers stress the importance of personal competence, namely the appropriate attitude, personality traits and cognitive skills. Furthermore, practicing translators often report a lack of training in the professional practice of translation and translation business management such as marketing, drawing up translation agreements, determining fees and project management in their pre-service preparation.

Based on the existing models and relevant studies, the key competencies of human translators in the age of AI, with a focus on market-oriented services, are identified as follows (**Table 1**):

**Table 1. Key Competences for TC Development in the AI Era.**

| Item | Competences                         | Description   | References   |
|------|-------------------------------------|---|--|
| 1    | Critical thinking (CT)              | The ability to think critically and independently to identify translation problems, find solutions and solve them. The ability to reason and create new solutions. The awareness of making ethical judgement, risk prediction and the ability to make decisions to prevent damage, harm and risks when using digital technologies, especially AI. | Fahim and Parham (2013); Liu (2019); Ghaemi and Sadoughvanini (2020); Cheng (2022); Yang and Wang (2023)   |
| 2    | Strategic Competence (SC)           | The ability to plan and execute translation projects (including selecting the most suitable method), identify and address translation challenges, evaluate the process and outcomes in relation to the intended purpose, and compensate for any deficiencies in other sub-competences   | PACTE (2003)   |
| 3    | Language Competence (LC)            | Language proficiency in reading, writing, listening and speaking in at least two languages. It encompasses socio-linguistic, pragmatic, textual, grammatical, lexical, phonetic knowledge.  | Relabeled from PACTE (2003)  |
| 4    | Intercultural Competence (IC)       | The ability to interact effectively and communicate appropriately with people from new or different cultures with acquisition and maintenance of culture-specific knowledge and skills.   | Relabeled from extralinguistic of PACTE (2003); culture and intercultural ability under EMT (2022)         |
| 5    | Translation Knowledge (TK)          | Declarative knowledge about various aspects of the profession, including the functions, history, process, strategies and techniques of translation.   | Relabeled from Knowledge about Translation sub-competence of PACTE (2003) and Translation of EMT (2022)    |
| 6    | Technology Competence (Techc)       | The ability to use technologies and tools to finish translation tasks efficiently (spanning the preparation, processing and refinement stages), including using searching tools to do information mining, employing AI, machine translation applications and platforms, perform post-editing and quality control to produce high quality output.  | EMT (2022)   |
| 7    | Thematic Competence (Thc)           | Reasonable multidisciplinary knowledge, such as economic, business, cultural, political, social, environmental and historical knowledge, etc.   | Relabeled from the subject knowledge in specific fields of extra-linguistic sub-competence of PACTE (2003) |
| 8    | Personal Competence (PC)            | The cognitive strengths, behavioural attributes and professional ethics expected of a qualified translator.   | Relabeled from EMT (2022)  |
| 9    | Project Management Competence (PMC) | Plan and manage translation project well and complete tasks on time.  | Relabeled, redefined from EMT (2022)   |
| 10   | Interpersonal Competence (Ipc)      | Be able to communicate, coordinate, cooperate in a team for common objectives and demonstrate generous, friendly and active teamwork spirit. Be capable of performing price negotiation and client contact.   | Relabeled from EMT (2022)  |

Drawing on the dimensions of the above TC framework, the present study conducted a survey on GUFL students' perceptions of TC development needs.

## Methodology

The study adopts a quantitative research method to investigate the current and expected levels of TC among students majoring in foreign languages. Combining research findings with theoretical reviews, the study proposes an integrated human and digital communication model of translation teaching, aiming to engage students in deep learning to develop their professional competences.

## Participants

The study was implemented at GUFL, a regional university in the Guangxi Zhuang Autonomous Region, China, focusing on the field of foreign language education. For the investigation of the current state and expected objectives of TC in GUFL students, a sample of 360 students were selected from a population of 3514 undergraduates in years 1-4, who were majoring in English, Business English, Translation and Interpreting, German, French, Spanish, Thai, Vietnamese, Japanese, Lao, Cambodia, and Indonesia. The sampling procedure followed the cluster-stratified-random method, and the sample size was determined in accordance with the table developed by Krejcie and Morgan (1970).

### ***Instruments***

A questionnaire was developed to assess both the current and expected levels of TC. It was adapted from the Intercultural Competence Scale for Chinese College Students (Wu et al., 2013), China Translation Proficiency Assessment Standards (2022), and EMT Competence Framework (2022), subscale of “Critical Thinking” in MSLQ (Pintrich et al., 1991), and relevant literature cited in the section of Literature Review. The questionnaire adopts a five-point Likert scale. The participants were asked to respond to each question item twice to report their current and expected levels of TC, respectively. As a result, two sets of data, pertaining to the participants’ current state of TC and their future goals, were obtained via one questionnaire.

### ***Procedure and Data Analysis***

The ethical approval was obtained from the IRB Committee of Payap University of Thailand. A total of 360 students, majoring in English, Business English, Translation and Interpreting, German, French, Spanish, Thai, Vietnamese, Japanese, Lao, Cambodia and Indonesian, participated in the questionnaire survey. The questionnaires were distributed to students online through QQ and WeChat. Before participating in the research, they were briefed on the research background, objectives, and the confidentiality and anonymity of their responses. After data collection, SPSS was used to process the data for validity, reliability, descriptive analysis, T test, and correlation analysis.

### ***Validity and Reliability***

Prior to data analysis, the validity and reliability of the data were tested. Preliminary analyses confirmed the suitability of the data for factor analysis. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.952,

indicating excellent sampling adequacy. Bartlett's test was statistically significant ( $p < 0.001$ ), suggesting that the correlation matrix differed significantly from an identity matrix, supporting the appropriateness of factor analysis. Using data on the current levels of students' TC, principal component analysis was adopted to extract the common factors, and the factor loading matrix was optimized through maximum variance rotation. The results revealed a total of 10 factors with eigenvalues greater than 1, collectively accounting for 74.754% of the cumulative variance, which met the criterion of above 60% as recommended by Hair et al. (2010). All the items had a factor loading of above 0.5 threshold, except for items 47 and 48, which loaded below 0.5 on their target component (IpC). The Cronbach alpha of IpC increased from 0.881 to 0.91 after the two items were removed, suggesting enhanced internal consistency after their deletion.

The study assessed the internal consistency of each variable using Cronbach's Alpha. The overall Cronbach's Alpha value of the 56 initial items was 0.974. After the removal of items 47 and 48, the value was 0.973, which exceeds the acceptable standard of 0.7, indicating excellent overall reliability of the questionnaire. According to the classification standard of DeVellis and Thorpe (2021), an Alpha value above 0.9 indicates "excellent" reliability of the scale, while one between 0.8 and 0.9 signals good reliability. The Alpha values of all dimensions in the questionnaire exceeded 0.85, indicating that the items within each dimension were well-designed. The measurement results were stable and reliable.

## Results

### *The Current and Expected Levels of TC*

A total of 360 questionnaires were collected, with one invalid, resulting in 359 valid responses. There were 70 male (19.5%) and 289 female (80.5%) participants. This gender distribution reflects the typical enrollment pattern of language-related majors in most Chinese universities, where female students significantly outnumber their male counterparts. The results also showed that 73% of the respondents had obtained a language-related certificate, and that only 0.3% held a translation certificate.

The results revealed that the current overall level of TC among GUFL students was moderate (mean=2.97, SD=0.55), whereas the expected level was high (mean=4.22, SD=0.51), according to the criteria established by Pallant (2015). A similar pattern was observed across all individual dimensions, aligning with the overall results. This means that the participants perceived each dimension of TC as requiring further development (**Table 2**).

Regarding the current state of students' TC, LC (mean=2.69, SD=0.692) scored the lowest, followed by ThC (mean=2.75, SD=0.728) and

**Table 2. Current Levels vs. Expected Levels.**

| TC Dimensions | Current Mean | Current SD | Expected Mean | Expected SD | T-value  | P-value | Interpretation |
|---------------|--------------|------------|---------------|-------------|----------|---------|----------------|
| SC            | 20.71        | 00.752     | 40.14         | 00.576      | -300.415 | 00.000  | Needs          |
| CT            | 20.99        | 00.679     | 40.17         | 00.615      | -250.777 | 00.000  | Needs          |
| LC            | 20.69        | 00.692     | 40.17         | 00.634      | -310.037 | 00.000  | Needs          |
| IC            | 30.13        | 00.658     | 40.28         | 00.605      | -280.352 | 00.000  | Needs          |
| TK            | 20.87        | 00.825     | 40.27         | 00.708      | -270.713 | 00.000  | Needs          |
| ThC           | 20.75        | 00.728     | 40.04         | 00.701      | -260.9   | 00.000  | Needs          |
| TechC         | 20.83        | 00.748     | 40.11         | 00.713      | -260.189 | 00.000  | Needs          |
| PC            | 30.35        | 00.683     | 40.39         | 00.646      | -270.016 | 00.000  | Needs          |
| IpC           | 30.10        | 00.836     | 40.36         | 00.664      | -250.879 | 00.000  | Needs          |
| PMC           | 30.09        | 00.745     | 40.25         | 00.683      | -240.348 | 00.000  | Needs          |
| TC            | 20.97        | 00.55      | 40.22         | 00.51       | -340.448 | 00.000  | Needs          |

SC (mean=2.71, SD=0.752). This suggested that students' language proficiency, domain-specific knowledge, and translation strategies were in dire need of improvement. Meanwhile, PC (mean=3.35, SD=0.683) scored the highest, followed by IC (mean=3.13, SD= 0.658) and IpC (mean=3.10, SD=0.836), which indicated that the students possessed a relatively solid foundation in professional qualities, ethics, and communication. Their expected levels of PC, IC, and IpC were also the highest, reflecting their high aspirations to build their professionalism in translation services.

### ***The Gap between Current and Expected Levels***

A gap analysis was conducted to identify deficiencies in the cultivation of TC in GUFL's foreign language education. Based on the data collected, the gaps between the current and desired levels of TC were determined and prioritized. The identified needs can then be utilized to develop learning objectives in terms of the knowledge, skills, and attitudes that learners are expected to demonstrate (Hauer & Quill, 2011).

As shown in **Table 2**, all the dimensions exhibited significant differences ( $P = 0.000$ ) between the current and expected competencies, indicating a substantial gap in TC training in GUFL. The high t-values across all dimensions indicated that the perceived "needs" were consistently present among the respondents for each issue. Notably, LC and SC were the dimensions displaying the largest gaps, which reflect a weak foundation in both linguistic proficiency and professional training.

### ***Correlation Analysis among Dimensions of TC***

The correlation matrix revealed significant positive correlations (all  $p < 0.01$ ) across all dimensions, showing dynamic interplay among sub-competences of TC.

**Table 3. Correlation Matrix Among TC Dimensions.**

|       | SC      | CT      | LC      | IC      | TK      | ThC     | TechC   | PC      | IpC     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| CT    | 0.616** |         |         |         |         |         |         |         |         |
| LC    | 0.598** | 0.609** |         |         |         |         |         |         |         |
| IC    | 0.455** | 0.604** | 0.547** |         |         |         |         |         |         |
| TK    | 0.548** | 0.570** | 0.569** | 0.562** |         |         |         |         |         |
| ThC   | 0.463** | 0.586** | 0.564** | 0.628** | 0.673** |         |         |         |         |
| TechC | 0.542** | 0.559** | 0.544** | 0.549** | 0.630** | 0.634** |         |         |         |
| PC    | 0.418** | 0.404** | 0.407** | 0.465** | 0.421** | 0.425** | 0.453** |         |         |
| IpC   | 0.356** | 0.433** | 0.441** | 0.452** | 0.376** | 0.509** | 0.485** | 0.399** |         |
| PMC   | 0.497** | 0.518** | 0.504** | 0.560** | 0.494** | 0.546** | 0.597** | 0.514** | 0.658** |

(\*\*p<00.01, significant correlation)

According to the matrix, CT stood out as a central connector, exhibiting strong correlations with SC (r = 0.616), LC (r = 0.609), IC (r = 0.604), TK (r = 0.570), ThC (r = 0.586), TechC (r = 0.559), and PMC (r = 0.518), along with moderate correlations with PC (r = 0.404) and IpC (r = 0.433). This highlighted CT’s essential role in integrating problem-solving, linguistic analysis, and cultural adaptation.

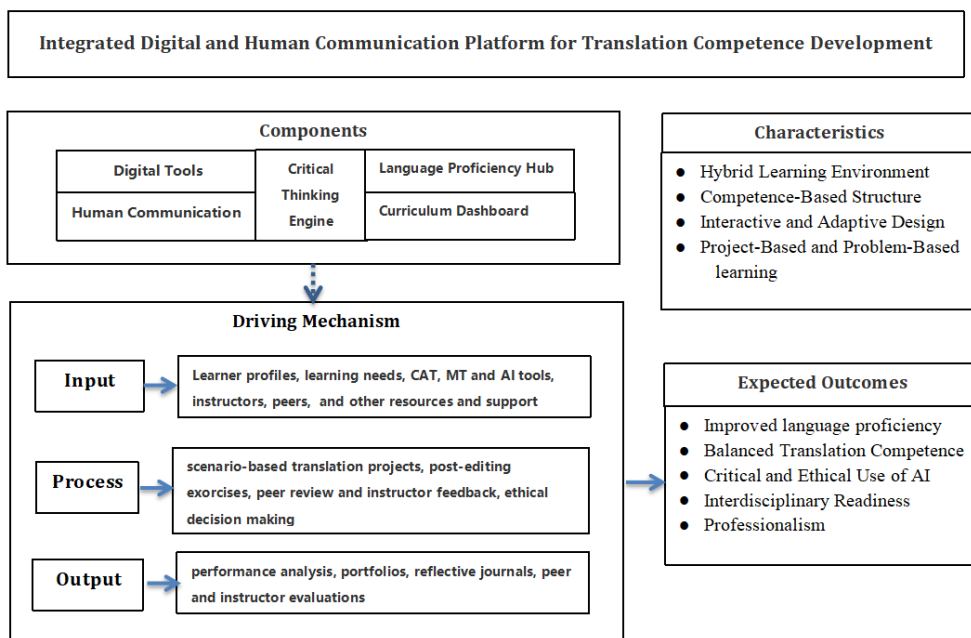
Likewise, LC also displayed strong correlations with most other dimensions, affirming its foundational role in supporting cross-dimensional translation skills. This finding aligns with Esfandiari et al. (2019), who identified language competence as one of the most relevant competences in practice.

There were strong correlations between TK and ThC (r = 0.673), TK and TechC (r = 0.630), and TechC and ThC (r = 0.634), underscoring the significance of interdisciplinary knowledge and translation knowledge for enhancing the use of technological tools.

PMC showed the strongest correlation with IpC (r = 0.658\*\*), indicating a close link between effective project cooperation and collaborative skills.

Combining the findings from the analysis of the current state and desired objectives, gap analysis, and correlation analysis, it was evident that all dimensions need further development. Among the sub-competences, CT and LC stood out as the dimensions that should be prioritized, with CT functioning as the core connector that links other competences, and LC as the foundational element. PC, IC, and IpC received the highest expectations, underlining the important roles of professional qualities and ethics in the AI era. The results suggest that there should be an adjustment in translation teaching to address the learning needs, with an emphasis on the cultivation of critical thinking and ethical engagement with technologies.

### ***Suggestions for Building an Integrated Human and Digital Communication Platform for TC Development in the Context of GUFL***



**Figure 1. Integrated Human and Digital Communication Platform for Translation Competence Development.**

In response to the evolving demands of the translation industry, particularly in the age of AI, this study proposes an *Integrated Human and Digital Communication Platform for Translation Competence Development* (**Figure 1**), designed to support the holistic development of TC among undergraduate students. This platform is not merely a technological solution but a pedagogical ecosystem that blends the strengths of digital tools with the irreplaceable value of human interaction.

The platform should have Four Key Characteristics:

1. **Hybrid Learning Environment:** Combining AI-powered translation tools and human-facilitated learning experiences, this environment ensures that learners benefit from the efficiency and scalability of technology while also developing the interpersonal, critical thinking, ethical, and cultural competences that only human interaction can foster.
2. **Competence-Based Learning Structure:** The platform is structured around ten core dimensions of TC to enable students to receive balanced and targeted training across essential areas.
3. **Interactive and Adaptive Design:** AI tools provide personalized feedback and simulate real-world translation scenarios, while

instructors and peers offer guidance, discussion, and collaborative learning opportunities.

4. Project-Based and Problem-Based Learning: Students engage in authentic translation tasks, including post-editing machine-generated texts, managing translation projects, and resolving ethical and cultural issues.

The Platform Components should comprise five interconnected modules:

1. Digital Tools Module: This module integrates corpus, CAT tools, machine translation systems, and generative AI applications. These tools help students practice translation, post-editing, and information mining, enhancing their Technology Competence (TechC), Thematic Competence (ThC), and Translation Knowledge (TK).
2. Human Communication Module: Designed to facilitate peer collaboration, client simulations, and intercultural exchanges, this module strengthens Interpersonal Competence (IpC), Intercultural Competence (IC), Personal Competence (PC), and Project Management Competence (PMC).
3. Critical Thinking Engine: Students perform tasks that require ethical judgment, problem-solving, and decision-making. AI-generated translations are critically evaluated by students. This process is to foster Critical Thinking (CT), Personal Competence (PC), and Strategic Competence (SC).
4. Language Proficiency Hub: Students engage in immersive bilingual activities, error analysis, and language lab exercises to build a strong foundation in Language Competence (LC).
5. Curriculum Dashboard: This module enables administrators to track student progress across all TC dimensions, align learning outcomes with industry requirements, and guide personalized learning paths.

The Driving Mechanism operates through a dynamic three-tiered structure:

1. Input Layer: Students enter the platform with diverse backgrounds and learning needs. CAT, MT and AI tools, instructors, and peers provide the resources and support, necessary for their TC development.
2. Processing Layer: Learning is facilitated through a blend of digital and human interaction. Students participate in translation projects, receive feedback, collaborate in teams, and reflect on their learning.
3. Output Layer: Competence development is measured using performance analytics, portfolios, peer reviews, and reflective

journals. With these outputs, students and educators inform themselves about progress and areas needing improvement.

The platform aims to help students to achieve the following Expected Outcomes:

1. Improved language and strategic skills, essential for high-quality translation.
2. Balanced translation competence across all ten dimensions.
3. Critical and ethical use of AI, enabling responsible integration of technology.
4. Interdisciplinary readiness, preparing students for domain-specific translation tasks.
5. Collaborative and professional skills, fostering teamwork and effective client engagement.

This platform represents a shift from traditional, teacher-centered translation education to a learner-centered, competence-based model. It empowers students not only to use technology effectively but also to think critically, communicate with ethical awareness, and collaborate meaningfully—skills that are indispensable in today's AI-augmented translation landscape.

## **Discussion**

The present study examined TC of 359 language majors at GUFL, focusing on their current levels of TC, expected learning outcomes, and inter-dimensional relationships. The findings offer valuable insights into how well student capabilities align with industry demands in the AI-driven translation landscape, with implications for curriculum design and pedagogical innovation. This section is devoted to discussing three main issues as follows.

### ***Needs Assessment on TC Development of GUFL***

#### ***Students***

This study applied a needs assessment approach to identify the gaps in TC between the current and expected levels as perceived by the student sample. The overall findings indicate that the current TC level ( $M=2.97$ ) of the students was moderate. This aligns with prior research suggesting that undergraduate translation students often struggle to meet professional demands due to insufficient development of comprehensive competences. They have difficulty in identifying and correcting errors in MT products because of inadequate training and low levels of language proficiency (Zhang & Qian, 2023). Notably, the mean scores for expected levels of TC in all dimensions consistently exceeded 4.0 (range: 4.04–4.39), reflecting students' strong awareness of the professional skills required in this field.

The current levels of LC (M=2.69), SC (M=2.71), and ThC (M=2.75) ranked among the lowest. We need to contextualize these deficits in relation to institutional and pedagogical factors specific to GUFL. As the cornerstone of translation (Neubert, 2000), LC's low mean points to inadequate bilingual proficiency. This may stem from GUFL's student demographics: the majority are language beginners with limited exposure to authentic and immersive language environments. Most of them are enrolled from within the Guangxi Zhuang Autonomous Region, where the basic education system is relatively less developed, and students receive weaker pre-tertiary language training. Traditional teaching methods hinder the development of SC, which is essential for problem-solving in translation. GUFL's reliance on teacher-centered instruction and decontextualized exercises may restrict the opportunities for students to practice real-world strategic decision-making (Kiraly, 2000). Without structured training in error analysis or resource utilization, students tend to rely on literal translation strategies. ThC's low score (M=2.75) indicates insufficient domain-specific knowledge. This can be attributed to the underdeveloped interdisciplinary curricula in GUFL, where few programs incorporate thematic modules or industry partnerships, leaving students unprepared to handle specialized texts.

Furthermore, the research results reveal statistically significant discrepancies between current and expected levels of TC across all ten dimensions (all  $p < 0.001$ ), indicating a need for systematic pedagogical enhancement instead of remediation of a certain competence. This echoes the industry calls for reassessing translation competences and translator training in the context of technological disruption (Hazaea & Qassem, 2024). LC and SC showed the largest gaps (difference value=1.4786 and 1.4279, respectively), aligning with Prieto Ramos (2024), who identified the two competences as top priorities for ensuring translation quality in professional settings. As Hatim and Mason (1990: 223) argue, it is the translator's linguistic competence that enables accurate semantic transfer and directly affects translation quality. The neglect of scenario-based training in traditional classrooms often leads to over-reliance on dictionaries rather than critical judgment. This also resonates with PACTE Group's (2005) study, which suggests that SC is responsible for decision-making and efficiency, and predicts professional readiness. TK displays the third largest gap, supporting PACTE Group's (2005) finding that the level of expertise affects the quality and process of translation. These findings suggest that GUFL's curriculum needs to place greater emphasis on project planning, problem-solving, translation knowledge, and advanced linguistic proficiency, which are deemed foundational even in AI-augmented workflows (EMT, 2022).

In contrast, PC showed the smallest gap (current M = 3.35 vs. expected M = 4.39), reflecting students' ethical awareness and cognitive

readiness—a foundation that pedagogical interventions can build upon (EMT, 2022).

## ***A Holistic and Interconnected Framework of Translation Competence***

Correlation analyses revealed strong interdependencies between competencies, reinforcing the holistic nature of translation competence (PACTE, 2003).

CT emerged as a central connector, correlating most strongly with SC ( $r = 0.616^{**}$ ), LC ( $r = 0.609^{**}$ ), and IC ( $r = 0.604^{**}$ ). CT also had strong correlations with other dimensions, with most correlation coefficients exceeding 0.5, supporting Darwin et al.'s (2023) assertion that CT is the “core competence of human translators” in the AI era. This finding validates Yang & Wang's (2023) proposition that CT integrates problem-solving, linguistic analysis, and cultural adaptation—skills crucial for evaluating AI outputs and ensuring ethical translation (Liu, 2019). It also aligns with Feng and Liu's (2018) post-editing competence model, where metacognitive strategies govern technical execution.

Notably, the strong correlations among TechC, TK and ThC suggested positive relationships between digital tools, professional skills and domain-specific expertise. This supports Prieto Ramos's (2024) finding that domain-knowledge is highly valued for ensuring translation quality despite the hype around technology. It also resonates with the EMT model's emphasis on “thematic competence” as a bridge connecting domain-specific expertise with technological application (EMT, 2022). For instance, students with sound economic or cultural knowledge may better leverage corpus tools or MT post-editing to address contextual nuances (Abu-Rayyash, 2023). These findings indicate that technological training should not solely focus on technical operation but should also be guided by translation knowledge and supported by corpus and domain-specific projects, thereby infusing purpose and relevance into the application of tools.

Nevertheless, the weak correlation between CT and TechC ( $r = 0.433^{**}$ ) is inconsistent with the EMT's 2022 technological competence framework, which posits digital literacy as integral to critical engagement. This discrepancy implies that current AI-assisted translation tools may be implemented without adequate metacognitive scaffolding.

## ***An Integrated Human and Digital Communication Platform***

The findings underscore the need for a human-centered, technology-integrated training model (Mah & Groß, 2024), which combines human and digital communication. First, curriculum reforms should prioritize LC, SC, and CT through problem-based and project-based learning. For instance, with simulated translation projects, students learn to plan workflows, troubleshoot MT errors, and justify revisions (Xiao & Wei, 2021), supported by digital translation instruments. Second, to foster the TK-ThC-TechC synergy, interdisciplinary electives, such as translation in business, culture, news, etc., could be combined with training in CAT tools, AI, or corpus analysis, together with strategic translation training of domain-specific texts. As suggested by Prieto Ramos (2024), post-editing skills shall be integrated within the scope of strategic competence in various translation tasks. Third, the gap in IpC (current  $M = 3.10$  vs. expected  $M = 4.36$ ) highlights the need for collaborative learning opportunities, such as team-based translation competitions or client role-plays, to enhance teamwork and negotiation skills (EMT, 2022). Finally, given the possible adverse effect of AI on CT (Panit & Naneta, 2025), it becomes increasingly important to “teach ethical and critical thinking in relation to technology” (Ramírez-Polo & Vargas-Sierra, 2023), and instructors should design tasks that require students to critically evaluate AI outputs—for example, comparing MT drafts with human translations to identify cultural biases or pragmatic errors (Abu-Rayyash, 2023). Critical thinking could also be cultivated through Gen AI-assisted scaffolding, which provides customized feedback and interactive learning (Owidi & Lyanda, 2025), with curriculum design aimed at encouraging students to think critically and actively (Wu, 2024). Additionally, GenAI is capable of working “as a valuable social interaction and cultural simulation tool for learners to practice collective sensemaking skills” (Borge et al., 2024).

The future development of the model can be grounded on six interrelated theories that collectively inform the pedagogical and technological design of the Integrated Human and Digital Communication Platform:

1. Technological Pedagogical Content Knowledge (TPACK) (Mishra & Koehler, 2006)). This framework ensures the meaningful integration of digital tools, such as CAT, MT, GenAI, into translation pedagogy, aligning technology with instructional goals.
2. Transactional Model of Human Communication (Barnlund, 2008)). This model emphasizes reciprocal and dynamic communication, shaping the Human Communication Module of the platform to foster interpersonal, intercultural, and ethical competencies.

3. Digital Literacy Theory (Belshaw, 2011). The theory advocates for critical engagement with digital tools, guiding the platform's ethical use of AI in culturally sensitive translation contexts.
4. Critical Thinking Pedagogy. This pedagogy encourages learners to use technologies in creative, wise and ethical manners (Walsh, 2016). It is operationalized through the Critical Thinking Engine, fostering questioning of assumptions and informed decision-making.
5. Competency-Based Education (CBE) (Wesselink, et al., 2017; Gervais, 2016). Focusing on measurable outcomes and mastery, the approach is implemented via the Platform's Curriculum Dashboard and Output Layer to track progress across ten competence dimensions.
6. Constructivist Learning Theory. It supports experiential and active learning, encouraging knowledge construction through experiences, interactions, and reflection (Shahini, 2025). This theory underpins the platform's project-based and problem-based learning design.

Together, these theories form a cohesive foundation for a learner-centered, competence-focused translation education model that balances digital innovation with human interaction.

Based on the above discussions, education reform is required to address the deficits in students' TC. GUFL should adopt the proposed Integrated Human and Digital Communication Platform with three pillars:

1. Foundational Strengthening: Prioritize LC training to lay a solid groundwork for TC development. Curricula should integrate advanced language training (e.g., corpus linguistics) with theoretical courses (targeting TK) to address LC and SC gaps.
2. CT-Centered Pedagogy: Adopt problem-based learning to foster CT. For instance, students can debate on ethical issues in machine translation or collaborate to revise flawed translations (Kiraly, 2000). By using AI as one of the learning agents, students engage in deep problem solving and translation quality evaluation, actively applying and enhancing their CT.
3. Digital-Industry Alignment: Integrate digital tools (such as AI, CAT and MT) and thematic projects (e.g., domain-specific translation workshops) to reduce TK, TechC, and ThC deficits and improve students' post-editing skills through real-scenario projects (Wang & Wang, 2023; Wang & Yang, 2023).

By integrating digital and human communication, an interactive learning environment could be created that encourages student engagement in activities designed for TC development.

## Conclusion

### *Implications*

Theoretically, the finding that CT acted as a “core connector” ( $r = 0.616$  with SC,  $r = 0.609$  with LC,  $r = 0.604$  with IC,  $r = 0.570$  with TK,  $r = 0.586$  with ThC,  $r = 0.559$  with TechC, and  $r = 0.518$  with PMC) extends the PACTE Group’s (2003) TC model. While prior research treated CT as a standalone skill, our correlation matrix suggests that it functions as a meta-competence, integrating linguistic, strategic, and cultural abilities. This reconceptualization underscores the need to shift from isolated competence training to a more holistic approach to TC development.

This study also offers insights for translation teaching and educational administration. LC should remain the top priority for all language majors. Program designers or managers shall place more weight on language proficiency to establish a solid foundation for TC development. SC and CT shall also be emphasized, which means teaching should focus on fostering students’ higher-order cognitive skills in their language acquisition and TC development rather than limiting itself to lower-order tasks like basic understanding and memorization. As Ghaemi & Sadoughvanini (2020) point out, there is a significant relationship between TC acquisition and higher-order thinking skills, as well as a strong and meaningful relationship between strategic competence and higher-order thinking skills, in novice translators. In the age of AI, uncritical use of AI tools could undermine analytical skills (Abu-Rayyash, 2023). As a result, AI-empowered learning shall be implemented alongside active and effective human interaction among teachers, students, clients, users, and professional translators (Wang & Wang, 2023). In short, students shall be guided to use technologies in technically sound and ethically responsible ways through integrated human and digital communication. The proposed Integrated Human and Digital Communication Platform will provide a useful reference to educators. The model outlines the overarching structure of TC development and could be applied in practical teaching and administration, such as course design, implementation, and evaluation.

### *Suggestions for Future Research*

This study is a case study of one educational institution. Future research could adopt longitudinal design to track changes in student TC after intervention. Additionally, incorporating faculty perspectives would yield insights into pedagogical barriers to TC development. Finally, applying this study’s findings to other regional universities in China can help assess and enhance their generalizability.

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