

Assessing AI-Assisted Translation Competency Among Development Economics Students

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Abstract: This research examines the translation capabilities of development economics students at Universitas Negeri Makassar when employing artificial intelligence-based translation tools for economic literature. As AI technology becomes increasingly prevalent in academic and professional environments, evaluating students' proficiency in utilizing these technological resources has emerged as essential for educational strategy formulation and skill enhancement initiatives. A quantitative survey methodology was implemented involving 107 students from the development economics program to measure translation precision, operational efficiency, and analytical assessment abilities during AI-supported translation processes. The findings indicate considerable disparities in skill levels, whereby students exhibited superior competence in fundamental translation activities while encountering difficulties with sophisticated economic vocabulary and contextual subtleties. The outcomes demonstrate that although AI-powered tools improve translation velocity and resource availability, systematic instructional frameworks are required to optimize their pedagogical value. This investigation adds to the expanding scholarly discourse on AI incorporation within translation pedagogy and offers actionable insights for academic program enhancement in economics education.

Keywords: artificial intelligence translation, economic literature, translation proficiency, development economics, educational innovation

1. INTRODUCTION

The rapid advancement of artificial intelligence (AI) technologies has fundamentally transformed various aspects of academic and professional life, with translation services emerging as one of the most significantly impacted domains. Contemporary AI-based automatic translation tools, including ChatGPT, Google Translate, and DeepL, have evolved from simple word-processing utilities to sophisticated linguistic instruments that serve as essential resources for students navigating multilingual academic environments (Komalova & Khranchenko, 2023). Within the discipline of economics, where students routinely encounter multilingual research papers, policy documents, and international economic reports, the capacity to effectively utilize AI translation tools has become increasingly critical for academic success and professional competency development (Gaspari et al, 20215).

Development economics, as an inherently interdisciplinary field that encompasses cross-cultural and multilingual perspectives, presents distinctive challenges for students who must navigate complex economic concepts across diverse linguistic and cultural boundaries (Pym, 2013). In the contemporary global economic context, characterized by intensifying international transactions and cross-border collaborations, the ability to effectively translate, edit, and technically adapt business and economic texts has become essential for professional competency (Kenny & Doherty, 2014). The integration of AI translation tools within this academic context offers unprecedented opportunities for enhancing learning efficiency while simultaneously presenting challenges related to competency development, critical evaluation skills, and pedagogical integration (Moorkens & O'Brien, 2017).

Despite the widespread adoption and remarkable convenience offered by AI translation tools, significant questions persist regarding students' competency in utilizing these technologies effectively for specialized economic content (Daems et al., 2017). The inherent complexity of economic terminology, cultural contexts embedded within theoretical frameworks, and the precision required for quantitative data interpretation demands more sophisticated engagement than simple word-to-word translation, necessitating advanced critical evaluation and contextual understanding capabilities from users (O'Brien, 2012). Translation technology based on artificial intelligence (AI) has gradually matured, yet the gap between technological capabilities and user competency remains substantial, particularly in specialized academic domains such as development economics.

This investigation addresses a critical gap in understanding student competency in AI-assisted translation within specialized academic contexts. The central research problem focuses on the current limitations in our empirical understanding of how development economics students effectively utilize AI translation tools and the factors that influence their competency development. Specifically, this study seeks to answer the fundamental question: What is the current level of AI-assisted translation competency among development economics students, and how do various individual and contextual factors influence their effectiveness in utilizing these tools for specialized economic content?

This investigation is guided by several interconnected research dimensions that collectively address the multifaceted nature of AI-assisted economic translation. The study examines student performance patterns across different categories of economic text translation when utilizing AI tools, with particular attention to identifying specific strengths and weaknesses that emerge across varying levels of content complexity. Individual learner characteristics, including English language proficiency, prior experience with AI tools, academic level, and domain-specific knowledge in economics, are analyzed as potential predictors of translation competency outcomes. The research also encompasses a comparative analysis of different AI translation platforms to determine their relative

effectiveness across various types of economic content, while simultaneously investigating the factors that influence students' decision-making processes in tool selection. These findings ultimately contribute to understanding the broader implications for curriculum development and pedagogical approaches within economics education programs, providing insights that can inform both instructional design and educational policy in the era of artificial intelligence integration.

The primary objective of this research is to comprehensively assess and quantify AI-assisted translation competency levels among development economics students, providing robust empirical evidence to inform educational policy decisions and curriculum development initiatives. This overarching goal encompasses several interconnected subsidiary objectives that collectively address the identified research questions and contribute to the broader understanding of AI integration in specialized academic education.

The first specific objective involves identifying and analyzing particular competency strengths and weaknesses in AI-assisted economic text translation across different complexity levels and content categories. This analysis aims to develop a nuanced understanding of how students navigate various types of economic discourse and the specific challenges they encounter when utilizing AI tools for specialized content translation. The second objective focuses on examining and quantifying the relationships between student demographic characteristics, academic backgrounds, previous AI experience, and translation competency performance, thereby identifying key predictive factors that influence successful AI tool utilization. The third objective encompasses evaluating and comparing the effectiveness of multiple AI translation platforms across various economic text categories, providing evidence-based recommendations for strategic tool selection in educational contexts. Finally, the fourth objective involves developing comprehensive practical recommendations for curriculum enhancement and pedagogical approaches that effectively integrate AI translation competency development into economics education programs, ensuring that students are adequately prepared for contemporary professional demands.

2. LITERATURE REVIEW

The integration of AI technologies in translation education has attracted considerable attention from researchers and educators globally, reflecting the transformative potential of these tools in academic and professional contexts. Recent research has demonstrated that the use of artificial intelligence technologies in educational practices could have a significant impact on the development of key competencies of future translators, with participants identifying essential professional competencies including linguistic, digital, technical, information, communication, special, business, and personal competencies (Komalova & Khramchenko, 2023). This finding underscores the multifaceted nature of contemporary translation competency requirements and highlights the need for systematic investigation of competency development in this rapidly evolving technological landscape.

Theoretical Foundations of Translation Competency

Contemporary models of translation competency have evolved significantly from traditional linguistic-focused frameworks to encompass technological, cognitive, and critical evaluation dimensions (Aiken & Balan, 2011; Teixeira, 2014). The foundational work of Pym (2013) established translation competency as a multidimensional construct incorporating linguistic accuracy, cultural sensitivity, and contextual understanding. However, the emergence of sophisticated AI translation tools has necessitated substantial

expansion of these competency frameworks to include technological literacy, critical evaluation skills, and human-AI collaboration capabilities (Läubli et al., 2018).

Recent theoretical developments by Gaspari et al. (2015) propose a comprehensive framework for AI-assisted translation competency comprising five core dimensions: technological proficiency in AI tool utilization, linguistic competence across multiple languages, domain-specific expertise, critical evaluation skills for AI outputs, and ethical awareness regarding AI application in professional contexts. This expanded framework provides essential theoretical foundations for understanding how traditional translation competencies must evolve to accommodate AI integration in educational and professional environments.

AI Translation Tools in Educational Contexts

The proliferation of AI translation technologies has fundamentally altered the educational landscape for translation studies and related disciplines. AI-based translation software models have become widely available, including Google Translate, Bing, Microsoft Translator, DeepL, Reverso, Systran Translate, and Amazon Translate, each offering distinct capabilities and limitations that necessitate informed selection based on specific translation requirements and contexts (Yamada, 2019).

Comparative effectiveness studies have revealed significant performance variations across AI translation platforms, with implications for educational implementation strategies. Research by Castilho et al. (2017) demonstrated that DeepL consistently outperformed competing tools in European language pairs, while Google Translate maintained advantages in language coverage and accessibility. A survey found that over three-quarters of translators expect generative AI to adversely affect their future incomes, highlighting professional concerns about AI integration while potentially overlooking the enhancement potential when these tools are properly integrated into educational programs.

Economic Text Translation Challenges

Economic discourse presents unique translation challenges due to specialized terminology, cultural specificity of concepts, and precision requirements for quantitative information (Gaspari et al., 2015). Unlike general text translation, economic content demands comprehensive understanding of theoretical frameworks, quantitative methodologies, and institutional contexts that vary significantly across cultural and linguistic boundaries (Kenny & Doherty, 2014).

Research by Daems et al. (2017) identified several critical challenges in economic text translation: terminological precision in specialized vocabulary, cultural adaptation of economic concepts across different institutional contexts, accurate presentation of quantitative data and statistical information, and maintaining coherence in theoretical framework discussions. These challenges become particularly pronounced when students attempt to translate complex academic economic texts without adequate domain expertise or well-developed critical evaluation skills.

Student Competency in AI-Assisted Translation

It is increasingly essential for translators to possess a high level of technological proficiency to succeed in their work, as technology is becoming an integral part and common practice of the translation field (O'Brien, 2012). However, research on student competency in AI-assisted translation reveals concerning discrepancies between technological capabilities and user effectiveness. Moorkens & O'Brien (2017) found that while students readily adopt AI translation tools for academic purposes, they frequently lack the critical

evaluation skills necessary to identify and correct errors, particularly in specialized content areas requiring domain expertise.

Recent studies have identified multiple factors influencing student effectiveness in AI-assisted translation, including prior language learning experience, technological literacy levels, domain-specific knowledge, and critical thinking capabilities (Daems et al., 2017; Läubli et al., 2018). The growing integration of AI dialogue systems within educational settings highlights the importance of understanding how over-reliance on AI affects students' cognitive abilities, particularly in contexts requiring sophisticated analytical skills such as economic text translation.

Pedagogical Approaches to AI Integration

The effective integration of AI translation tools into educational curricula requires careful consideration of pedagogical approaches and learning objectives aligned with contemporary competency requirements. Recent research suggests that traditional translation teaching methods have many limitations, necessitating innovative approaches that leverage AI capabilities while developing critical evaluation skills (Wu & Zhang, 2024). Teixeira (2014) advocates for a scaffolded approach to AI integration in translation education, beginning with basic tool familiarization and progressing through increasingly complex applications that develop both technological proficiency and critical evaluation capabilities. This pedagogical framework allows students to systematically develop competency in both AI tool utilization and sophisticated analysis of AI-generated outputs, preparing them for professional contexts requiring human-AI collaboration.

3. METHODOLOGY

Research Design

This study employs a quantitative research design using a cross-sectional survey approach. The quantitative methodology was chosen to provide measurable and generalizable findings about translation competency levels among the target population.

Participants

The study population consisted of undergraduate students enrolled in development economics programs at a major Indonesian university. A total of 107 students participated in the study, representing a comprehensive sample of the target population. Participants were selected using purposive sampling to ensure representation across different academic levels (sophomore, junior, and senior students) and demographic characteristics.

The inclusion criteria encompassed students who were currently enrolled in a development economics program and had completed at least one semester of economics coursework. Additionally, participants were required to demonstrate basic proficiency in English and Indonesian languages and have prior exposure to academic economic texts.

Data Collection Instrument

A structured assessment tool was developed to measure translation competency across multiple dimensions. The instrument incorporated a Translation Accuracy Test where students were required to translate five economic text passages of varying complexity using AI tools, with accuracy measured against expert translations. An Efficiency Assessment component measured translation speed and tool utilization effectiveness through timed exercises. The instrument also included a Critical Evaluation Component where students evaluated AI-generated translations for accuracy, appropriateness, and potential

improvements. Finally, a Demographic and Experience Questionnaire gathered information about academic background, language proficiency, and prior AI tool usage.

AI Tools Utilized

Students were provided access to three commonly used AI translation tools, namely Google Translate, DeepL Translator, and ChatGPT for translation tasks. These tools were selected to represent the range of AI-powered translation resources commonly available to students in academic settings.

Text Selection

Economic texts were selected to represent different levels of complexity and various subfields within development economics. The selection included basic economic concepts and definitions, policy documents and reports, academic journal excerpts, statistical and quantitative content, and theoretical framework discussions. This diverse range ensured comprehensive assessment of translation competency across different types of economic discourse.

Data Analysis

Data analysis was conducted using SPSS version 28.0. Descriptive statistics were calculated for all variables, and inferential statistics including correlation analysis and regression modeling were employed to examine relationships between variables. The analysis focused on overall competency scores and distributions, performance differences across text types and complexity levels, relationships between student characteristics and competency, and patterns in error types and frequency. This comprehensive analytical approach enabled thorough examination of translation competency patterns and their associated factors.

4. RESULTS

Participants

The sample of 107 development economics students showed diverse characteristics in terms of academic level, language background, and prior AI tool experience. The majority of participants (58.9%) were junior-level students, with 23.4% sophomores and 17.7% seniors. Regarding language proficiency, 73.8% rated their English proficiency as intermediate, while 26.2% considered themselves advanced users.

Prior experience with AI translation tools varied significantly, with 45.8% reporting regular use, 38.3% occasional use, and 15.9% minimal to no prior experience. This distribution provided a suitable range for analyzing the relationship between experience and competency.

Overall Translation Competency

The overall translation competency scores ranged from 42.5 to 87.3 points out of 100, with a mean score of 68.7 (SD = 12.4). The distribution approximated normality, with slight negative skewness (-0.23), indicating that most students performed at or above the average level.

Competency levels were categorized into three distinct groups based on performance scores. High competency, defined as scores between 80-100 points, was achieved by 18.7% of students, demonstrating exceptional translation abilities. The largest group, representing 56.1% of students, fell into the moderate competency category with scores ranging from 60-79 points, indicating satisfactory translation skills. Meanwhile, 25.2% of students

demonstrated low competency with scores below 60 points, suggesting significant areas for improvement in their translation abilities.

Performance by Text Type and Complexity

Analysis of performance across different text types revealed significant variations in student competency levels. Students achieved the highest accuracy rates when translating basic economic concepts ($M = 78.2$, $SD = 8.9$), demonstrating strong competency in translating fundamental economic terminology and simple explanatory texts. This superior performance likely reflects their familiarity with core economic vocabulary through their academic coursework.

Performance declined notably for policy-related content ($M = 65.4$, $SD = 11.7$), with students struggling particularly with bureaucratic language and policy-specific terminology. The formal nature of policy documents and their specialized vocabulary presented challenges that were not encountered in basic conceptual materials.

Academic journal content emerged as the most challenging category, showing the lowest scores ($M = 58.1$, $SD = 14.2$) and reflecting difficulties with complex theoretical discussions and specialized academic language. The sophisticated argumentation and technical precision required in academic texts proved particularly demanding for students at this level.

Statistical content yielded moderate performance levels ($M = 71.8$, $SD = 10.3$), indicating reasonable competency in translating quantitative information, though errors in technical terminology were observed. Students appeared more comfortable with numerical data and basic statistical concepts but struggled with specialized statistical vocabulary.

AI Tool Effectiveness

Comparative analysis of AI tool performance revealed distinct preferences and effectiveness differences among the various platforms available to students. Google Translate emerged as the most frequently used tool, with 67.3% of students expressing preference for this platform, though it showed only moderate accuracy for complex texts. Despite its popularity, likely due to accessibility and familiarity, students recognized its limitations in handling sophisticated economic content.

DeepL received the highest accuracy ratings from students, with 73.8% expressing satisfaction with its performance, particularly for European language pairs. Students noted that DeepL provided more nuanced translations and better preserved the original meaning of complex texts compared to other automated tools.

ChatGPT proved most effective for contextual explanations, with 81.2% of students finding it helpful in this capacity, though it required more sophisticated prompting skills. Students who successfully utilized ChatGPT often employed detailed prompts that included context about the economic concepts being translated, leading to more accurate and contextually appropriate results.

Factors Influencing Competency

Correlation analysis identified several significant predictors of translation competency that provided insights into the key factors determining student success. English proficiency level showed a strong positive correlation with overall competency scores ($r = 0.47$, $p < 0.001$), confirming that language skills serve as a fundamental foundation for effective translation work.

Prior AI tool experience demonstrated a moderate positive correlation with performance ($r = 0.34$, $p < 0.01$), suggesting that familiarity with these technologies

enhances translation effectiveness. Students who had regularly used AI translation tools appeared better equipped to leverage their capabilities and recognize their limitations. Academic level also showed a significant relationship with performance ($r = 0.28$, $p < 0.05$), with senior students consistently outperforming their younger peers. This improvement likely reflects both increased language exposure and deeper understanding of economic concepts through advanced coursework.

Economics background knowledge emerged as the strongest predictor of specialized text translation accuracy ($r = 0.52$, $p < 0.001$), highlighting the critical importance of domain expertise in producing high-quality translations. Students with stronger foundational knowledge in economics were better able to identify and correct translation errors, particularly those involving specialized terminology.

Error Patterns and Critical Evaluation Skills

Analysis of translation errors revealed common patterns that provide insights into the most frequent challenges encountered by students. Terminology mismatches represented the largest category of errors, accounting for 34.6% of all mistakes and typically involving incorrect translation of specialized economic terms. These errors often occurred when students relied too heavily on automated translations without considering the specific economic context.

Contextual misunderstandings comprised 28.1% of errors and reflected students' failure to consider the broader economic context when making translation decisions. These mistakes often resulted in technically accurate word-for-word translations that nonetheless conveyed incorrect meaning within the economic framework.

Cultural adaptation issues accounted for 22.3% of errors and involved inappropriate cultural assumptions that affected the accuracy of translations. Students sometimes applied cultural references or assumptions from their native context that were not appropriate for the target language and economic system.

Grammatical and stylistic problems represented 15.0% of errors and were primarily related to language mechanics rather than conceptual understanding. These errors typically involved sentence structure, verb tenses, or stylistic conventions that differed between languages.

Critical evaluation skills assessment revealed significant variation in students' ability to identify and correct translation errors. While 62.6% of students could successfully identify obvious translation errors, such as clearly incorrect terminology or grammatical mistakes, only 31.8% demonstrated sophisticated evaluation capabilities for more nuanced issues. This finding suggests that while most students possess basic error detection skills, fewer have developed the advanced critical thinking abilities necessary for identifying subtle contextual or cultural translation problems.

5. DISCUSSION

Translation Competency Levels

The results indicate that development economics students demonstrate moderate levels of AI-assisted translation competency, with significant room for improvement (Gaspari et al., 2015). The mean score of 68.7 points suggests that while students can utilize AI tools for basic translation tasks, they lack the sophisticated skills needed for complex economic content.

The distribution of competency levels, with only 18.7% achieving high competency, highlights the need for targeted educational interventions. The substantial group of students (25.2%) performing at low competency levels requires particular attention in curriculum development.

Complexity-Dependent Performance

The clear performance hierarchy across text types (basic concepts > statistical content > policy documents > academic journals) reflects the increasing linguistic and conceptual demands of specialized economic discourse. This pattern suggests that translation competency development should follow a scaffolded approach, beginning with fundamental concepts and gradually introducing more complex content (Kenny & Doherty (2014).

The particular challenges faced with academic journal content align with previous research highlighting the difficulties of translating specialized academic discourse. Students' struggles with this content type indicate the need for explicit instruction in academic translation strategies and disciplinary discourse conventions.

AI Tool Selection and Utilization

The differential effectiveness of AI tools across content types suggests that competent users must develop tool selection skills based on specific translation needs. While Google Translate's popularity reflects its accessibility and general utility, students' higher satisfaction with DeepL for accuracy and ChatGPT for contextual understanding indicates the value of exposing students to multiple AI translation options (Castilho et al., 2017).

The finding that ChatGPT required more sophisticated prompting skills highlights an important competency dimension that traditional translation education has not addressed: the ability to effectively communicate with AI systems to achieve desired outcomes.

Predictive Factors

The strong correlation between economics background knowledge and translation competency ($r = 0.52$) underscores the importance of domain expertise in effective translation. This finding supports the argument that translation competency in specialized fields requires both linguistic and disciplinary knowledge (Daems et al., 2017).

The significant relationships between English proficiency, prior AI experience, and academic level with translation competency suggest that comprehensive competency development requires attention to multiple skill areas rather than focusing solely on translation techniques.

Critical Evaluation Challenges

The limited critical evaluation skills demonstrated by students (only 31.8% showing sophisticated evaluation capabilities) represent a significant concern for educational practice. As AI tools become more sophisticated and their outputs more persuasive, the ability to critically evaluate and post-edit translations becomes increasingly important (O'Brien, 2012).

This finding suggests that current approaches to translation education may be insufficient for preparing students to work effectively with AI tools. Educational programs must explicitly address critical evaluation skills alongside technical translation competencies.

6. CONCLUSION

This study provides valuable insights into the AI-assisted translation competency of development economics students, revealing both strengths and areas for improvement. While students demonstrate basic competency in utilizing AI translation tools, significant gaps exist in handling complex economic content and critically evaluating AI outputs.

The findings suggest that effective integration of AI translation tools in economics education requires comprehensive curriculum development addressing technical skills, critical evaluation capabilities, and domain-specific knowledge. The strong relationship between economics background knowledge and translation competency reinforces the importance of disciplinary expertise in effective translation practice.

As AI technologies continue to evolve and become more integral to academic and professional work, the development of sophisticated AI-assisted translation competencies becomes increasingly important for economics students. Educational institutions must proactively address this need through curriculum innovation and pedagogical adaptation.

The research contributes to the growing understanding of AI integration in higher education while providing practical guidance for improving translation education in economics programs. Future research should continue to explore the evolving relationship between AI technologies and human competency development in specialized academic domains.

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