Journal of English Language and Pedagogy (JELPA)
Vol. 3, No. 1, May 2025, Page 46-67
P-ISSN: 2988-2826 | E-ISSN: 2987-8225

The Role of Machine Translation in English Language Learning: A Systematic Review

Judelyn P. Alones
Benguet State University, Philippines
Corresponding Author: alonesjhudelyn@gmail.com

Article History:
Submitted: 18/12/2024
Revised: 08/05/2025
Accepted: 20/05/2025

Keywords:
Systematic Review; Translation Bias; Generative AI; Gender-Neutral

Abstract. This systematic literature review (SLR) examines the functions, limitations, and effectiveness of machine translation (MT) tools in English language learning. Most of the reviewed studies addressed the context of English as a Foreign Language (EFL), with few references to other linguistic environments. MT tools have been successful in translating text quickly and improving personalized learning experiences. Yet, these tools continue to grapple with context-sensitive translation, including that which demands cultural sensitivity or gender fidelity. The review identifies an increasing demand for incorporating MT tools into pedagogical approaches, underlining learner attitudes and cultural as well as linguistic difference challenges like gender bias. Even so, the research also necessitates better MT systems, proposing a blended approach with human post-editing to counter these weaknesses. The research identifies a wide knowledge gap in areas such as the Philippines and other underrepresented scopes, restricting the generalizability of findings to various learning settings. Consequently, overcoming biases, improving tools accuracy, and offering transparent usage instructions remains an unexplored area. Subsequent research needs to broaden the scope through a range of research designs, especially mixed methods and experimental studies, and investigating the utilization of MT tools in various learning environments. Furthermore, researchers need to enhance the incorporation of MT in language instruction, fixing biases, and refashioning these tools for more inclusive, sensitive applications. Lastly, more research needs to examine the sociolinguistic effects of gender bias in MT and AI tools for a variety of gendered and low resource languages to promote an ideal and productive learning environment.

Citation: Alones, J. P. (2025). The Role of Machine Translation in English Language Learning: A Systematic Review. *Journal of English Language and Pedagogy (JELPA),* Vol 3(1), 46-67. DOI: https://doi.org/10.51826/jelpa.v3i1.1388

INTRODUCTION

Not only has technological development accelerated the speed and number of translations, but it has also developed the skills of learners in language learning. NMT's expansion in 2016 has introduced tremendous changes in productivity, consistency, and accuracy of MT tools. These tools, undoubtedly, can improve language learning by offering instant translation, in addition to translanguaging practice, and enabling language discovery. It has also made these tools cheaper and easier to access. Because of their potential, MT tools have become keystone for language learners globally, however, they have limitations that need to be addressed.

Literature indicates that while MT tools have developed significantly over time, there is still room for improvement in accuracy, gender bias and context. For instance, Yoon and Chon (2022) reported errors in verb tense and mistranslation, while Abdulaal et al. (2022) reported polysemy and syntactic ambiguity in MT output. Moreover, Olkhovska and Frolova (2020) found students

tended to over-depend on MT tools without analyzing the output critically, thus resulting in more mistakes. MT tools have also been accused of misgendering characters and perpetuating stereotypical gendering (Blodgett, 2021; Farkas et al., 2022). Despite those drawbacks, MT tools are still capable of assisting language learning, especially in assisting students in transitioning between languages. Nevertheless, experts warn against making too much of these aids, underscoring the need for human intervention and post-editing to guarantee accuracy. For example, research by Winiharti et al. (2021) and Awadh and Khan (2020) indicates that MT can sometimes provide contextually incorrect results, particularly with intricate texts or neologisms. Yet, as MT tools partnered with generative AI technologies, improved, their application in language learning opens exciting possibilities. Though, drawbacks, such as gender and other sociocultural biases, remain a concern. Furthermore, most studies on the localities and MT tools have not yet been explored. Although researchers have stressed that MT tools should be properly integrated into educational environments to gain their benefits to the full, combating its biases in language acquisition continues to be an issue. The situation emphasizes the significance of professional training for teachers, so they can effectively employ MT and incorporate it into inclusive classrooms. Finally, the implementation of MT tools in educational settings must be well designed to measure the advantages and disadvantages, leading to both linguistic skills and cultural awareness among students.

MT software such as ChatGPT, Google Translate, and others are continuously changing, being combined, revised, or criticized with the passage of time. Therefore, a sequential approach is required to determine a more coherent understanding and pinpoint meaningful insights from past similar studies and prevent the possibility of replication. Furthermore, it is also important to determine research gaps to assist future educators and researchers focusing on areas where more research is required. Also, evidence-based research on what, why, and how MT tools are effective, particularly in language learning is essential. With these trends, misconceptions, proper dependency, and new teaching and learning methodologies will be emphasized.

Given these challenges, there is a need to carry out a systematic literature review (SLR) in order to aggregate current research studies on the functions, influence, effectiveness, and possible developments of MT on building language skills that would further improve language learning. To meet the objectives of this study, the following review questions were addressed:

1. Which specific areas of study are addressed?
2. What are the research designs and instruments utilized in the studies?
3. Where are the studies conducted?
4. What are the significant findings, conclusions and recommendations of the reviewed articles on MT tools?.

METHOD

The systematic searching of relevant literature was carried out in three prominent electronic databases. Educational Research Information Center (ERIC), Taylor & Francis, and ScienceDirect were used by the researcher with the keywords Machine Translation in English Language Learning to find each study. The search was restricted to publications between 2020 and 2024 that investigated the application of MT tools for English Language Learning. Only those studies that were included based on the inclusion criteria and quality appraisal process were kept. Subsequently, an operational definition of the problem was created in defining inclusion and exclusion criteria so that clear guidance could be provided (Abrami, Cohen, & De Apollonia, 1988). The eligibility criteria were first used in a flexible manner so that all studies relevant to the problem were captured, and proper evaluation was carried out before any study was excluded. Exclusions were only made up to the point that studies met one or more of the exclusion criteria

in a strict evaluative framework to select studies that met high methodological standards (Meline, 2006).

The researcher also followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. As such, publications are crucial in facilitating discussions among researchers regarding significant approaches and methodologies (Kalichman, 2001). Then, a repertory grid was utilized in plotting responses to the research questions. It is originally called Kelly's grid (1955), an innovative method for systematically assessing individual personal constructs (Fransella, Bell, Bannister, 2006).

In screening, the researcher made use of criteria in choosing journal articles: a) database, b) journal publication type, c) time frame, and d) descriptors. Particularly, the researcher's search was on studies on MT in English Language Learning published in the last five years from 2020-2024. In addition, only peer-reviewed journal articles with available full-text were considered.

This search resulted in 34,022 research articles. Following the filtering process for peer-reviewed, full-text articles published in the past five years, the researcher limited the articles to 1,916 articles. Then, adding the descriptors second language learning, translation focus, and journal articles, the researcher narrowed the articles down to 161. The researcher then used the Taylor & Francis database, which initially yielded 34,022 articles. By restricting the search to the last five years of articles published (2020-2024) and social sciences research, the researcher came up with 13 articles of relevance. Lastly, the researcher also tried the ScienceDirect database with the same keywords used in ERIC and Taylor & Francis. Restricting the search to articles within the themes of Linguistics and Teaching Education, the researcher came across 13 relevant articles. A total of 187 research papers were screened for potential inclusion and coding.

To validate the quality of the included studies, each study was assessed according to criteria such as research objectives' clarity, adequacy of methodology, procedures for data collection and analysis, and validity of conclusions. The overall studies' quality was classified based on the Systematic Review Accelerator (SRA), which is a set of automation tools built by the Institute for Evidence-Based Healthcare at Bond University in Australia (Clark et al.,2020). The SRA key software such as screenatron and deduplicator were also used during the screening process to increase efficiency, accuracy and completeness of screened articles for review. Particularly, all the abstracts were carefully read, then screened according to topic relevance.

Exclusion of English language literature and grey literature particularly conference proceedings and institutional reports may have affected the comprehensiveness of the review. These are limitations that the researcher recognized. The articles met the following preliminary inclusion and exclusion criteria using the keywords Machine Translation in English Language Learning. The research articles were ensured to meet the above-quoted criteria and further assessed and selected to be reviewed. In addition, every article must include the commonly accepted format of a scientific paper divided into introduction, methods, results/findings, and discussions (Sharp, 2002). Out of 187 remaining studies, it was further screened according to completeness as retrieved with the assistance of SRA suite. Completeness includes author, title, abstract and must have been published in the English language. Researches with authors omitted, titles, or abstract and done in other languages besides English were excluded. Hence, 83 research articles were coded and thematically analyzed.

Table 1. Inclusion-Exclusion Criteria for Selecting Journal Articles in the Present Study

Parameters	Inclusion Criteria	Exclusion Criteria
Type of Research	Primary research published in peer-reviewed journals; scientific	Book reviews, opinion pieces, literary reviews, policy documents, articles that are

	papers available in full text and open access.	not peer-reviewed, unavailability of open access and full text.
Results of the Study	Research articles or scientific papers that dealt with Machine Translation and Translation in English Language Learning.	Research articles or scientific papers that did not focus on Machine Translation, Translation, and English Language Learning.
Language	Research articles that made use of English as a medium of writing.	Research articles or scientific papers that did not make use of English as a medium of writing.
Data Base	ERIC, Taylor and Francis, and ScienceDirect.	Databases not accessible to the researcher.
Time Frame	Research articles that are published from 2020 to 2024.	Research articles published beyond the set time frame.

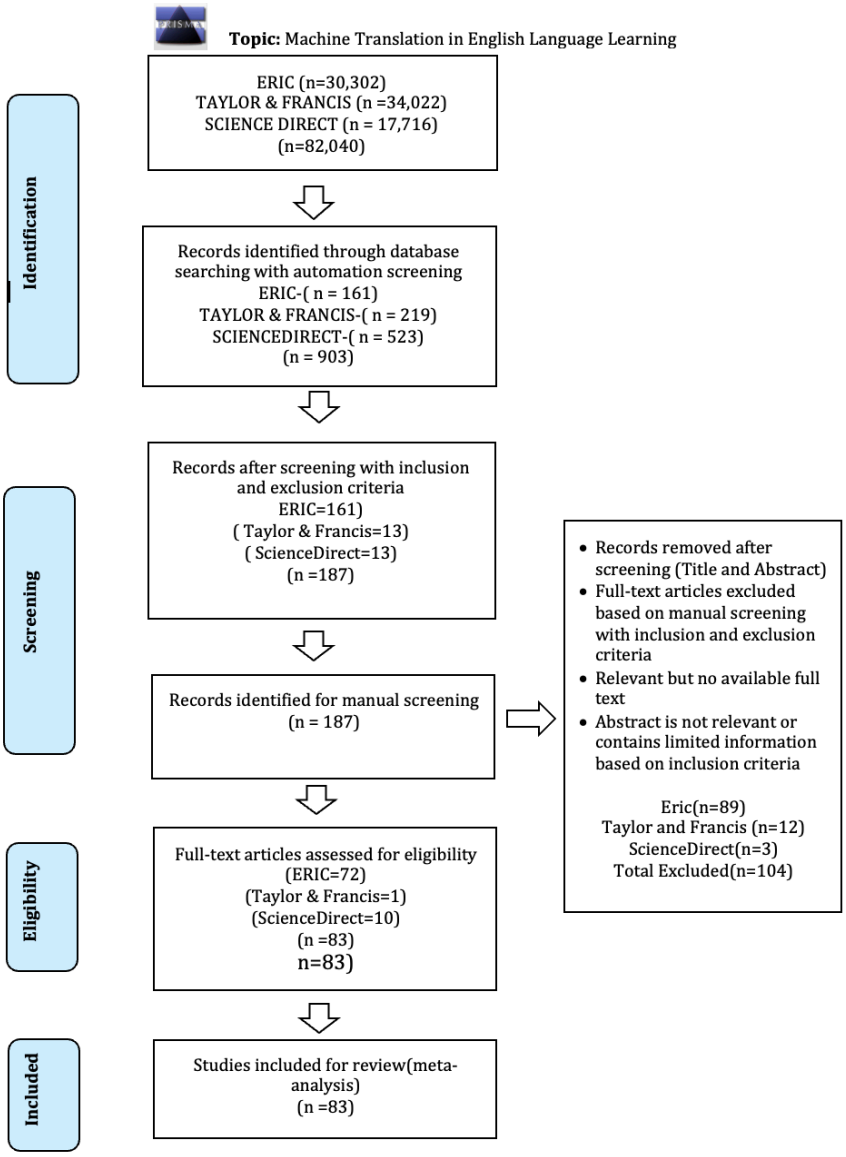

Figure 1. PRISMA Chart

Reults and Discussions

This paper synthesized the studied articles based on the research addressed, research methodologies, key findings and results of the studies. Then, the major themes and trends in relation to the MT tools' role, impact and role on English language learning were established through coding and categorization. Thereafter, important themes and trends concerning the areas focus, location of studies, tools utilized, results, and accountability of MT tools in learning English were using coded and categorized.

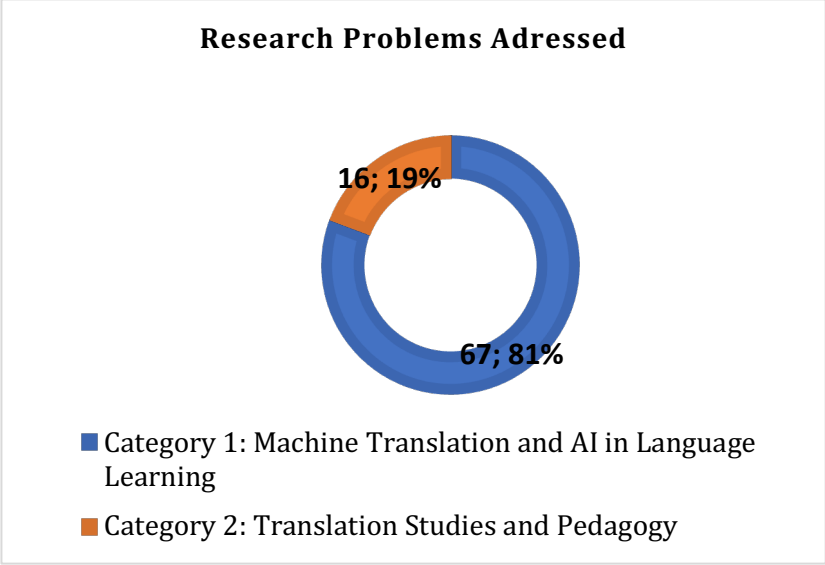

Figure 2. Areas of Studies Addressed

Through systematic coding and categorization on the areas of studies addressed, two major themes were uncovered: (1) MT tools AI roles in language learning, and (2) Translation studies pedagogical challenges and limitations.

Interestingly, the dominant theme composing 67 studies from the articles reviewed is the application of MT and AI tools specifically in the field of enhancing vocabulary and writing skills. Particularly, it encompasses the success of MT tools in acquiring language learning competencies in classroom learning environments, autonomous learning environments, their influence, the success of incorporating MT and AI tools in language teaching pedagogies and designing new MT tools tailored for language learners. For example, Loock et al. (2024) studied the effectiveness of such tools in improving students' understanding of complex English compounds for French learners of English as a second language. Additionally, Alharbi (2023) compared the quality of writing drafts created with and without the aid of Google Translate. Similar studies on the effectiveness of machine translation tools were recently explored (Alsadoon et al., 2021; Fernández-Costales et al., 2023; Hidayat et al., 2023; Jeharsae et al., 2024; Menik et al., 2021; Mojtaba & Vahid, 2020; Ting et al., 2021). Moreover, Yoon et al. (2022) analyzed the types of MT errors encountered by learners and evaluated the effectiveness of various error correction strategies based on the learners' English proficiency levels. Similarly, Lo et al. (2023) evaluated the effectiveness of using parallel texts in translation tasks to improve lexical gains and vocabulary retention among EFL learners. Specifically, these studies explored the skills required for the effective use of MT tools, highlighting the need for training programs to enhance user competence. Hence, the full potential of MT and AI tools in language learning are already explored, recognized and utilized as aids in enhancing language learning skills but has yet to be fully realized.

Other significant related categories are teachers' and learners' perceptions, quality, and uses of MT. For example, Kim and Oh (2023) explored the functional uses and quality evaluation of MT performance by EFL learners. Tongpoon-Patanasorn and Griffith (2020) also assessed the understandability and usability of Google Translate translation errors of academic abstracts and user experience and satisfaction with these tools. In addition, other studies investigated the beliefs and attitudes of students and teachers towards MT tools and offered insights into their adoption in learning environments. It emphasizes the necessity to evaluate the quality and efficacy of incoming tools in learning and facilitating smooth flow and quality and improvement of language acquisition. Therefore, with or without algorithmic progress, studies keep on developing focusing on the precision, functions, influence, and efficiency of MT tools in language teaching and learning.

Out of the articles reviewed,19% were focused on translation studies and pedagogy addressing researches pertinent to the wider field of translation studies and language teaching application. This indicates that the current trend is shifting towards incorporating digital aids like MT and AI tools towards developing and refining learners' language learning capabilities. Conversely, though fewer articles (16) fall under this theme, it is still a substantial body of research indicating the need for traditional practice and how it applies to language education. Thus, this alerts users to the appropriate integration of MT and AI in language education while addressing the ongoing significance of traditional ways of language learning.

For example, Kimsesiz et al. (2022) examined the cultural and linguistic problems of Turkish students of English in translating some English proverbs into their Turkish counterparts. Also, Demir et al. (2020) examined the difficulties encountered by students in properly translating ablative and locative cases from Turkish into English. Also, Mohammadi, Beiki, and Keyvanfar (2022) evaluated the effect of back-translation training combined with collaborative tasks on the translation performance of students. In concurrence, Almaghlouth et al. (2024) examined metaphorical expression in economic discourse based on conceptual metaphor theory. Also, Algryani, et al. (2021) investigated bilingual public signage's ability to increase translation students' critical literacy, language consciousness, and translation ability. Then, AlAqad and Al-Saggaf (2021) determined practical procedures for surmounting the translation difficulties of cultural words between Malay and English. Moreover, Werdiningsih et al. (2024) investigated advantages of employing ChatGPT in academic writing and pinpointed challenges and ethical implications of its application. These studies highlight the significance of sociolinguistics in translation processes.

Another research examined the kinds of spelling mistakes committed by Saudi university English majors (Alenazi et al., 2021). Additionally, Köksal et al. (2020) measured and examined the differences in the cultural competence based on demographic characteristics development of students and determined which courses are responsible for this development. Furthermore, Peng et al. (2021) compared and examined the process of translation among students while translating ancient Chinese poetry. Moreover, Bekereci-Sahin et al. (2022) assessed how translation courses benefit pre-service EFL teachers. Further, Vura et al. (2022) investigated correlations among certain personality features of translators. Combined together, these indicate that effective translation is not only a matter of language skills but also of grasping cultural contexts that need appropriate training and digital proficiency.

The two major themes that were identified in the studies reflect a tension between MT affordances and constraints in language learning. Although learners gain advantage from language support, the use of pedagogical design and ethical framing by MT is essential to its success. It initiates a shift from the conventional perception of MT tools as a substitute for human

intervention to a balancing tool that facilitates autonomy, awareness, and language learning competence. Also, significant heterogeneity was observed between the 83 studies within this review. The studies differed in several key respects, including study design, population and locale of the studies.Table 2. Data Gathering Tools

Rank	Instrument/Tool	Frequency
1	Test Questionnaires	59
2	Corpus of Data and Recordings	23
3	Interviews	20
4	MT and AI Tools	9
5	Focus Group Discussion	4
6	Observation	4

The table above illustrates the prevalent data collection tools utilized across the reviewed articles, ordered by frequency. Six prevailing patterns and preferences were identified following a review of the research instruments adopted by the reviewed articles. The diversity in methodology and different means of testing language learning through MT tools are thus evidenced in the tools utilized.

Overall, the reviewed studies have a subjective methodological viewpoint. The dominance of test questionnaires illustrates an inclination towards measurable results, while corpora, interviews, and observation illustrate an insistence on recording the distinct linguistic features and learners' experience of using MT tools. The thematic trends indicate a constraint on the qualitative component as supported in the limited bases of research which utilize the focused group discussion and observation. Thus, carrying out case and ethnographic studies as well as combining quantitative and qualitative instruments will provide a clearer picture of understanding the linguistics experiences of users of how MT tools have an impact on language learning and development.

Table 3. Research Design Employed

Research Approach	Research Design	Research Article	Total	Percentage
Quantitative	Descriptive/Comparative/Correlational	21	37	**45%**
	Quasi-Experimental	7		
	Experimental	9		
Qualitative	Descriptive	14		**33%**
	Case Study	13	27	
Mixed-Methods	Sequential Explanatory	6	19	**22%**
	Sequential Exploratory	13		
Total		**83**	**83**	**100%**

The 83 reviewed articles shows that quantitative methodologies were most utilized, with 45% of the studies utilizing quantitative descriptive designs for giving objective information on MT in English language learning. (Alalimi et al., 2020; Kim et al., 2022). Experimental and quasi-experimental were less used, as only seven studies employed quasi-experiments to cope with limitations in causal inference (Alharbi, 2023; Ting et al., 2021), whereas nine studies employed experimental designs to obtain more distinct causal relations (Alshehri et al., 2021; Yuah & Shin, 2020). Concurrently, qualitative descriptive designs were employed in 33% of the studies to delve into learners' experiences in-depth (Al Aqad & Al-Saggaf, 2021), albeit this method falls short of quantitative research's generalizability. Some Case study designs were also revealed, providing

rich contextual information regarding learners' interactions with MT tools (Algryani et al., 2021; Loock et al., 2024).

Moreover, 19 studies utilized mixed-methods research, with six applying sequential explanatory designs and thirteen applying sequential exploratory methods (Kemaloglu-Er et al., 2022; Kim & Oh, 2023). This emerging trend depicts an ongoing realization to weigh statistical analysis against more in-depth qualitative inquiry for comprehension of language learning's complex dynamics of MT. The application of mixed methods reflects researchers' aim to bridge quantitative findings with users' insight to obtain a more complete picture. Generally, the dominant application of descriptive and mixed methods designs indicates a trend in research toward the recording of measurable effects and richer user experiences, to contribute to more complete findings in MT and language acquisition.

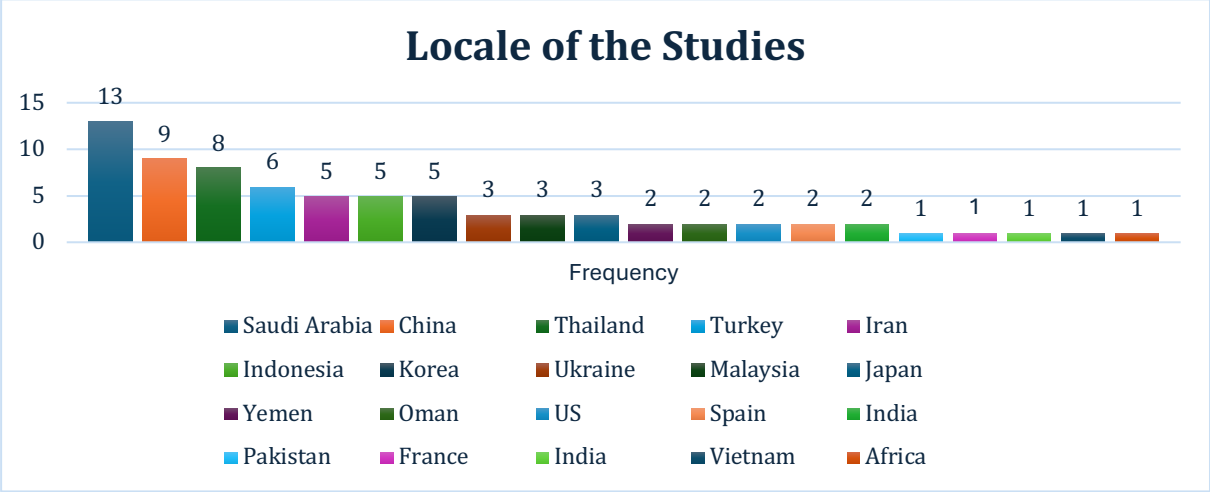

Figure 3. Locale of the Studies Reviewed

The variety of countries on which the studies were carried out reflects the international interest in MT and its functions and uses in English language acquisition.

Among 83 locations reviewed in the studies, a considerable percentage featured Asian nations. Indeed, Saudi Arabia, with nine articles, emerged as the leading location in reviewed articles. China was the second location, and Thailand the third location. Further, Turkey took the fourth spot, while Iran, Indonesia, and Korea took the fifth position in studies under review. Notably, Japan, Malaysia, and Ukraine ranked sixth, with three research articles carried out in each of the countries. Yemen, Oman, the United States, Spain, and India followed with two articles from each of the nations. Finally, Pakistan, France, India, Vietnam, and Africa ranked seventh with single research carried out in each country. They were major contributors in this area, representing a large percentage of the studies. This indicates that these settings favor online learning through investigating, utilizing, and recognizing MT tools as a facilitator of independent language learning.

Secondly, areas like Iran, Indonesia, Korea, Ukraine, Japan, and Thailand also made an important contribution but fewer studies were undertaken in these countries. Additionally, South Asian nations like India and Pakistan and European countries like Spain, France, and Ukraine were covered under the study. All these varied geographic regions reflect the extensive use and research on MT tools across different linguistic and cultural scenarios. Surprisingly, none of the studies from the Philippines were identified through the screened lists, hinting a possible geographic representation gap. Hence, it suggests limited research on the applications, functions, and roles of MT tools in language learning in the Philippines and other underrepresented regions.

This result further captures that while growing use of MT tools is geographically specific, the articles pointed out small groups, namely the university-level learners in the studies. Thus, there is a necessity for geographically distributed studies represent varying learners, institutions of type, and technology bases yielding more inclusive and generalizable findings.

Table 4. Significant Research Findings

Significant Findings	Research Articles	Percentage
Translation Pedagogy and Assessment	22	27%
Effectiveness of Machine Translation in Language Learning	20	24%
Learner Perceptions, Strategies and Factors Affecting Translation Outputs	19	23%
Challenges and Limitations in Translation	11	13%
Need for ICT Translation Skills and Training for MT users	10	12%
Machine Translation Errors	1	1%
Total	**83**	**100%**

The table shows the significant findings of the reviewed research articles categorized by their primary focus categorized into six themes.

First, MT has become an increasingly important tool in translation pedagogy and assessment as advocated by 27% of the articles. This is viewed as an effective bridge to enhance understanding and improve language skills. However, MT's limitations in accuracy highlights the need for critical thinking and evaluation skills when using MT tools. As reliance on MT grows, various strategies for assessing MT output have emerged as learners can actively evaluate the accuracy and appropriateness of MT translations.

Moreover, the effectiveness of MT in Language Learning is featured by 24% of the articles. Research by Loock et al. (2024) suggests that while MT provides certain advantages, generative AI tools like ChatGPT are more effective in helping students understand complex noun phrases. Similarly, Koralage, Choi, and Cross (2023) emphasize that the effectiveness of digital tools varies depending on factors such as students' language proficiency, cultural background, and first-language influence. In contrast, Jeharsae et al. (2024) claim that students showed notable improvements in translation competence, particularly in problem identification, evaluation, and correction, though their decision-making regarding translation outputs remained slower. Lao et al. (2023) also found that translation courses significantly enhance pre-service teachers' linguistic competence and reading comprehension, benefiting their teaching skills. However, participants recommended increasing the number of translation courses and redesigning content to better support aspiring translators and advanced learners. These findings reinforce the value of modular instruction and training in translation competence, highlighting the role of translation tasks in vocabulary retention. Thus, these underscore the growing demand for translation-related activities in English and scientific fields.

Under the Learner Perceptions and Strategies theme, 23% of the articles show that learners have developed strategies to effectively use MT tools. These include assessing MT output, leveraging it for specific tasks, and combining it with other learning techniques. However,14 research articles focus on Translation Pedagogy and Assessment. These findings emphasize the importance of effective pedagogy in teaching translation skills. Modularized instruction and training courses can enhance translation competence. In addition, integrating translation tasks into language curricula can improve vocabulary retention and overall language proficiency. However, challenges like the lack of information about translation programs and compatibility between teaching and testing methods persist.

Challenges and limitations in translation emerged in 13% of the articles. It shows notable discrepancy that emerged between learners' and instructors' perceptions concerning online MT tools (Ata & Debreli, 2021). Additionally, Alaboud et al. (2022) found that the experimental group, which engaged in translation tasks prior to comprehension activities, significantly outperformed the controlled group. Additionally, learners generally perceived a positive impact of generative AI tools on their writing skills, textual analysis revealed only slight improvements (Nguyen et al., 2023). However, many lexical and syntactic errors were attributed to negative transfer from their first language. In fact, Maghsoudi and Mirzaeian (2020) found a negligible difference in reading comprehension between students exposed to human translation and those exposed to MT, suggesting that MT has significantly improved and can be competitive with HT. However, Tongpoon-Patanasorn and Griffith (2020) reported that both the comprehensibility and usability of translated abstracts were at a moderate level, indicating that generative AI may not have fully meet the language requirements for academic writing. In fact, Awadh and Khan (2020) found that most students struggled to understand English neologisms or find suitable Arabic equivalents, and MT produced poor results for most types of neologisms. Overall, human translations were found to be more acceptable than those generated by MT. For instance, Kimsesiz et al. (2022) discovered that learners performed better in translating maximally equivalent proverbs than in translating roughly equivalent ones.These demonstrate that learners and educators have varying perceptions and strategies in language learning indicating that language background, age and professions are factors affecting MT utilization.

Furthermore, the need for ICT translation skills and training for MT users are underscored by 12% of the articles like Alharbi (2023), Ata and Debreli (2021), Kim and Oh (2023), Loock et al. (2024), Olkhovska and Frolova (2020), Sittirak and Ranong (2023), and Winiharti, Syihabuddin, and Sudana (2021). Thus, using generative AI tools as an aid in learning can suggestively enhance students learning experiences by fostering greater independence. This indicates that MT and AI tools serve as effective bridges to enhanced language learning repertoire.

In contrast, while the translations were generally accurate, some inaccuracies were observed (Winiharti et al., 2021). This suggests that future research is needed to monitor the advancement and improvement of MT tools in language learning per se. Despite the significant progress of MT tools, limitations in terms of accuracy remains evident. Consequently, this has led to a notable increase in research output related to MT and AI tools in academia. Furthermore, there has been a significant rise in reliance on MT and AI tools in the field of language learning. Despite the drawbacks, Thowaini et al. (2024) revealed that online, industry-driven training programs positively impacted trainees' translation skills. This indicates that developing language skills can be achieved through a balanced use of digital tools, human translation expertise, and training programs.

The need for translation skills and training for MT users was underscored by 10% of the articles. Mohamed et al. (2023) found that both English as a Foreign Language (EFL) teachers and learners have positive perceptions of Second Language Acquisition through Learning with Language Technology (SALL). However, many teachers expressed a need for further skills to improve their SALL activities and reported various challenges. Also, Ting et al. (2021) reported that nearly all participants achieved high scores in the post-test, indicating significant improvement in vocabulary knowledge. Interviews revealed that they found Google Translate beneficial for enhancing their English proficiency. Though, Baishymyrova et al. (2022) discovered that participants' overall ICT skills were moderate, with low hardware knowledge but high access and communication abilities in virtual environments.

Users' reliance on MT and AI tools comes with the potential risks and benefits of such reliance, and the ethical implications. For instance, Alharbi (2023) found that students are increasingly reliant on AI-enabled MT, particularly in higher educational settings. Despite facing significant barriers, students interestingly utilized various strategies to navigate their learning processes (Ao et al., 2021). They exposed that some students relied on generative AI output without editing due to a lack of confidence in their own abilities. Students primarily focused on correcting lexical and syntactic errors but did so at a superficial level (Chompurach et al., 2021). Key findings indicate that students value ChatGPT for its ability to clarify vocabulary, provide content suggestions, and help overcome uncertainties in writing (Werdiningsih, Rusdin Marzuki, Diyenti et al., 2024). This signifies that learners are aware of the capabilities of MT and AI tools in the field of writing but not its limitations.

Finally, only 1% of the articles explored the types of errors that MT systems produce, the factors contributing to these errors, and potential strategies for error detection and correction. A significant number of translations result in English active voice constructions, demonstrating a limitation in accurately reflecting the original passive meaning (Kim, 2022). Surprisingly, Yoon et al. (2022) showed that mid-proficiency learners benefited from relying on literal translations, while low-proficiency learners who used multiple strategies also saw improvements in error corrections. Interestingly, Farkas et al. (2022) found a notable bias against women in translations, with biased results occurring frequently. The translations tended to align more closely with societal perceptions of occupations rather than objective statistical distributions of gender representation. With the rise of these digital tools as aids in writing, results indicate that further research is needed to address inconsistencies in translating grammatical gender in gender-neutral and gendered languages.

Overall, the table reveals a strong focus on the affordances and pedagogical implications of MT, learner perceptions, and the challenges and limitations of MT systems. Language learners are increasingly interested in understanding how MT can be effectively integrated into language learning and translation practices. Hence, addressing the issues associated with cultural and linguistic differences including gender bias in translation are necessary.

Table 5. Conclusions and Recommendations

	Conclusions	Number of Research Articles
A.	Enhancing Linguistic and Translation Skills	**15**
B.	MT as a Pedagogical Aid in Language Learning	**11**
C.	Training for MT Accuracy and Critical Evaluation	**7**
D.	MT and Technology in Translation Education	**8**
E.	Challenges and Limitations in MT Quality	**8**
F.	MT's Role in Vocabulary and Translation Skill	**7**
G.	Development of Cultural and Linguistic Skills	**8**
H.	Competence in Translation Practical Skill	**8**
I.	Development of Translation Tasks	**7**
J.	Recommendations for Future Research on MT	**8**
	Total	**87**

The most salient result is to prioritize enhancing linguistic and translation skills making up 18% of the articles. This is evidenced by the research of AlAqad and Al-Saggaf (2021), Alenezi et al. (2020), Al Thowaini and Qassem (2024), Ata and Debreli (2021), Awadh and Khan (2020), Chon and Shin (2020), Fernández-Costales et al. (2023), Kemaloglu-Er et al. (2022), Karpushyna et al. (2021), Lai et al. (2023), Li et al. (2020), Loock et al. (2024), Pornwiriyakit and Dandee (2022), Sittirak and Ranong (2024), and Winiharti et al. (2021), which concluded that MT and AI

tools improve linguistic analysis and instrumental ability. Consequently, they propose incorporating MT and AI technologies into language learning courses to encourage skill acquisition, especially in skills like post-editing and accuracy training.

Following closely is the recognition of MT as a pedagogical aid in language learning representing 13% of the articles as postulated by Alharbi (2023), Chompurach et al. (2021), Chon and Shin (2020), Kim (2022), Kim and Oh (2023), Koralage, Choi, and Cross (2023), Maghsoudi and Mirzaeian (2020), Mohamed et al. (2023), Mohammed et al. (2020), Rohan et al. (2021), and Ting et al. (2021). The results suggest that educators should be trained to teach MT effectively to maximize the learning feats. Then, some studies recommended training for MT accuracy and critical evaluation, development of cultural and linguistic skills, competence in translation practical skill, and development of translation tasks.

MT quality challenges and limitations, representing 10% of the articles, point to continued issues regarding the reliability and productivity of MT tools in educational contexts. The studies propose creating systematic frameworks for MT integration, modular teaching practices, and collaborative learning methods in curricula. For example, research conducted by Alalimi et al. (2020), Chernovaty et al. (2024), Farkas et al. (2022), Jie et al. (2020), Lee et al. (2023), Leivada et al. (2023), and Mohammadi et al. (2022) advocate the need to explore MT's learning potential in more detail to maximize its contribution to language learning and translation education.

The studies of Alhassan, Sabtan, and Omar (2021), Deng et al. (2020), Lo et al. (2023), Okagbu et al. (2023), Peng et al. (2021), and Zakeri and Kasikhan (2020) endorse the inclusion of parallel-text methods and corpus-based materials in English as a Foreign Language (EFL) and translation studies for improved vocabulary acquisition and understanding. Besides, research by Angkana and Griffith (2020), Awadh and Khan (2020), Bekereci-Sahin et al. (2022), Farkas et al. (2022), Jabu et al. (2021), Kim (2022), Mohamed et al. (2023), and Yagi et al. (2024) shows that MT is faced with difficulties in dealing with special language features and upholding academic quality. These researchers suggest upgrading MT algorithms to maximize academic and linguistic precision and issuing user training to cope with MT limitations, especially in specialized environments using neologisms and passive structures.

According to the results, technology supports vocabulary acquisition and success in spelling (Akbari et al., 2020; Alenazi et al., 2021; Alsadoon et al., 2021; Baishymyrova et al., 2022; Jahangard et al., 2022; Werdiningsih et al., 2024; Younus et al., 2023). Therefore, they motivate language teachers to utilize MT and AI software, such as chatterbots, for vocabulary learning and error detection. The results indicate that incorporating cultural competence is necessary for successful translation (AlAqad & Al-Saggaf, 2021; Almaghlouth et al., 2024; Demir et al., 2020; Fishman et al., 2021; Kimsesiz et al., 2022; Köksal et al., 2020; Lo et al., 2023). They suggest curriculum revisions to include the study of cultural and heritage languages to improve translation skills and highlight the importance of culturally similar proverbs in learning. Practical skills in translation are enhanced with cooperative teaching models and real-life applications such as subtitling (Aminudin & Hidayati, 2022; Alhaj & Albahiri, 2022; Hidayat et al., 2023; Stoeckel et al., 2024; Thowaini et al., 2024; Xiao et al., 2023). Recommendations are comprised of practical work, equilibrated learning methods, and increased subtitling training for accessibility.

The results highlight balancing technology integration during instruction with critical assessment of MT's potential. Thus, practicing trends are respectable, while further research on MT fronts needs to be investigated (Abdel-Reheem Amin et al., 2020; Boonsuk et al., 2024; Jahangard et al., 2022; Kim et al., 2020; Mpalami et al., 2022; Powell et al., 2022; Simatupang et al., 2024; Vural et al., 2022; Yao et al., 2021).

CONCLUSION

Most of the reviewed articles focused on exploring MT and AI tools as facilitators for learners' communication and translation activities. Recently, there has been increased focus on exploring the effectiveness and impact of these tools on teaching and learning languages.

Most studies concerning the impact of MT tools on English Language Learning have paid particular attention to EFL learners and even professional practitioners. This area has recently started to gain attention from the general and the professional public. Furthermore, localized MT tools can translate content to cultures or languages making sure that the translation is accurate. Besides, AI can improve translation accuracy by identifying and amending grammatical, syntactical, and semantic errors. To achieve optimal results, a balanced solution involving human intervention coupled with AI technology is advisable. With ongoing advancements in generative AI, leveraging its integration with MT tools is vast. Nevertheless, it is important to utilize such tools wisely, taking into consideration their pros and cons. It is only by realizing their weaknesses and tapping their strengths that users can utilize new digital tools in language learning development efficiently.

Furthermore, researchers employed various research designs in their studies for an in-depth analysis. For example, most research employed quantitative research approach in data collection but only a few explored on the experimental approach. The dominance of quantitative methods, with limited experimental studies, suggests a need for more diverse methodologies to provide a holistic understanding of MT in language learning. Experimental analysis and mixed methods design researches with a wider population scope could offer deeper insights into the causality and effectiveness of MT tools not only in academic settings but also to the public and specialized users. Moreover, most of the reviewed articles were conducted in Asian countries engaged in EFL subjects.

Asian countries tested MT tool's role and importance in independent language acquisition and learning environments but revealed that there is limited research from the Philippines. The concentration of studies in countries like Saudi Arabia, China, and Thailand indicates that research on MT tools in EFL contexts is geographically skewed. This could result in findings that may not fully capture the experiences or needs of learners in other regions. There is a clear need to localize research to assess MT's impact in diverse educational systems, ensuring that findings and recommendations are relevant and actionable for specific contexts. This highlights an opportunity for researchers to investigate MT's role in language learning, content creating and addressing the unique linguistic and cultural characteristics of the underrepresented areas.

Concerning the important findings, a strong emphasis on the pedagogical implications of MT, learner attitudes, and MT challenges and limitations imply that future researchers should address issues related to cultural and linguistic differences. Gender bias in translation should be undertaken by future MT developers. This necessitates the formulation of instructional strategies that can assist educators to design learner-centered instructional materials that maximize the potential of MT in teaching. The emphasis on challenges, including cultural and linguistic differences and gender bias in translation, reflects the need for critical assessment of MT systems. It implies a need for interdisciplinary studies that not only examine the technical developments of MT but also tackle sociolinguistic matters, promoting more inclusive and equitable language learning practices.

The reviewed articles advocate that MT tools, especially, Google Translate, DeepL and other neural machine translation are recognized and used in English language learning specifically in improving language skills and writing accuracy. Generally, they are also seen to be used positively

not just by students and teachers but also by professionals. Therefore, it recommends careful integration and supervision because of their limitations.

MT tools are utilized by learners and educators with different perceptions and integration in language education; however, most studies reveal that MT tools are useful albeit some risks and bias. Moreover, studies need to investigate how MT could be effectively merged with generative AI tools to reduce errors and biases and enhance their use in translation tasks.

In addition, researchers can include other types of resources such as textbooks, book chapters, conference papers, and other types of conference proceedings that can aid in advancing the research. Besides, more complex designs should be added to the research in addition to the predominant quantitative approaches used in the study. Moreover, while the causal mechanisms boost the learning of a language using MT tools, it can also be through deep experimental studies that will shed more light on the efficacy of such tools. There is also the need to go beyond the locales of the reviewed articles. Studying less popular areas such as the Philippines will provide new insights about the inequal adoption of MT tools across different educational settings. More cross-sectional and regionally focused research that appreciates the cultural and linguistic diversity of different countries is required. The research should focus on investigating what role MT tools can have towards the effective facilitation of instruction in targeted educational contexts to respond to solutions that are contextually appropriate. Moreover, other research can focus on the relations between MT tools, educational systems and cultures across the globe to foster strategies that would suit all users.

Researchers should consider using a wider range of research designs to conduct a more in-depth analysis. While previous studies have primarily focused on word-level and phrase-level analysis of MT translations, future research could explore the translation of entire paragraphs and literary texts. This would provide a deeper understanding of the potential and limitations of MT tools providing a clearer understanding of MT's capabilities and limitations in complex texts. Additionally, researchers should incorporate translation studies and AI-related theories to gain a more comprehensive grasp of the purpose, roles, and limitations of these tools.

Moreover, future studies should focus on improving MT systems to better handle cultural and linguistic differences to address challenges like gender bias eventually contributing to a more inclusive and culturally sensitive MT systems. For more in-depth studies, future research should extend the time frame beyond 2020 to 2024 to capture language learning impact with the evolution of MT tools. Additionally, research on gender bias in MT and AI translations should be replicated in other gendered languages, such as Spanish, French, Russian, German and other linguistic contexts. Moreover, future studies should explore gender bias in MT tools in gender-neutral languages, such as Filipino and other Asian and local languages. This is essential to understand how MT and AI tools handle gender neutrality in a more comprehensive approach.

Finally, to ensure meaningful realization, clear guidelines on scope of use, interdisciplinary domains and specific tasks within translation frameworks should be set. In addition, inadequate training in the usage of MT tools impacts the value it offers. Therefore, training for teachers is urgent.

ACKNOWLEDGMENTS

I extend my heartfelt appreciation to my professor, Dr. Jhordan Cuilan, for his valuable guidance, constructive feedback and encouragement throughout the course of this review. I am also thankful to my family, classmates, and colleagues for the shared support, suggestions, and friendship reflected in this work.

REFERENCES

Abrami, P. C., Cohen, P. A., & d'Apollonia, S. (1988). Instructional interventions that reduce the effects of school transition on students' attitudes and behavior. Review of Educational Research, 58(3), 309-339. https://doi.org/10.3102/00346543058003309

Aigerim, B., Aida, S., & Tulebike, K. (2022). Investigating information and communication technology (ICT) skills and professionally-based competencies of translator candidates. International Journal of Education in Mathematics Science and Technology, 10(4), 894–917. https://doi.org/10.46328/ijemst.2647

Abdulaal, M., Alqaralleh, B., & Alzoubi, H. (2022). Polysemy and syntactic ambiguities in machine translation output. Journal of Translation Studies, 34(2), 112-125.

Alaboud, A. (2022). The positive effect of translation on improving reading comprehension among female arabic learners of english as foreign language. Arab World English Journal, 13(2), 424–436. https://doi.org/10.24093/awej/vol13no2.29

Alalimi, M. (2020). The impact of weblogs on teaching translation: yemeni learners' attitudes and perceptions. Anatolian Journal of Education, 5(2), 59–72. https://doi.org/10.29333/aje.2020.525a

AlAqad, M. H., & Al-Saggaf, M. A. (2021). Issues in translating cultural terms between english and malay: a comparative analysis. Pedagogical Research, 6(4), em0106. https://doi.org/10.29333/pr/11272

Alenezi, A. M. (2020). Task-based approach in teaching translation: a case study in Jouf University. Higher Education Studies, 10(2), 189. https://doi.org/10.5539/hes.v10n2p189

Algryani, A., & Syahrin, S. (2021). Utilizing learners' linguistic landscape as a pedagogical resource in the translation classroom: A case study in the Sultanate of Oman. Arab World English Journal, 12(1), 357–373. https://doi.org/10.24093/awej/vol12no1.24

Alhaj, A. a. M., & Albahiri, M. H. (2020). The effectiveness of cooperative work procedure in enhancing translation skills among Saudi students of translation at King Khalid University. International Journal of Higher Education, 10(3), 100. https://doi.org/10.5430/ijhe.v10n3p100

Alharbi, W. (2023). The use and abuse of artificial intelligence-enabled machine translation in the EFL classroom: An exploratory study. Journal of Education and e-Learning Research, 10(4), 689–701. https://doi.org/10.20448/jeelr.v10i4.5091

Alhassan, A., Sabtan, Y. M. N., & Omar, L. (2021). Using parallel corpora in the translation classroom: moving towards a corpus-driven pedagogy for Omani translation major students. Arab World English Journal, 12(1), 40–58. https://doi.org/10.24093/awej/vol12no1.4

Almaghlouth, S., & Alotaibi, L. (2024). HEART metaphors in economic discourse corpora: conceptual evidence and translation insight. Cogent Arts and Humanities, 11(1). https://doi.org/10.1080/23311983.2024.2331671

Alsadoon, R. (2021). Chatting with ai bot: vocabulary learning assistant for saudi efl learners. English Language Teaching, 14(6), 135. https://doi.org/10.5539/elt.v14n6p135

Alshehri, A. A. (2021). The mapping process from L2 lexical forms to L1 meaning. Journal of Language and Linguistic Studies, 17(1), 481–492. https://doi.org/10.52462/jlls.31

Aminudin, M. F., & Hidayati, A. N. (2022). Examining students' translation quality in subtitling for the deaf and hard of hearing. IJELTAL (Indonesian Journal of English Language Teaching and Applied Linguistics), 7(1), 107. https://doi.org/10.21093/ijeltal.v7i1.1199

Awadh, A. N. M., & ShafiUll, K. A. (2020). Challenges of translating neologisms comparative study: Human and machine translation. Journal of Language and Linguistic Studies, 16(4), 1987–2002. https://doi.org/10.17263/jlls.851030

Bekereci-Şahin, M. (2022). Investigating translation courses at an undergraduate efl teacher education program: views of instructors and pre-service teachers. European Journal of English Language Teaching, 7(1). https://doi.org/10.46827/ejel.v7i1.4114

Benmokhtari, H. (2021). The need for translation in the globalized world English Arabic contact in the Algerian academic context. Arab World English Journal, 12(1), 28–39. https://doi.org/10.24093/awej/vol12no1.3

Blodgett, S. (2021). Gender bias in machine translation: The challenges of handling stereotypes. Computational Linguistics Journal, 45(4), 678-695.

Chang, L. (2022). Chinese language learners evaluating machine translation accuracy. The JALT CALL Journal, 18(1), 110–136. https://doi.org/10.29140/jaltcall.v18n1.592

Chernovaty, L. M. (2024). Covert simultaneous post-editing in online assessment of students' sight translation. Advanced Education, 12(24), 12–27. https://doi.org/10.20535/2410-8286.295548

Chompurach, W. (2021). "Please Let me Use Google Translate": Thai EFL Students' Behavior and Attitudes toward Google Translate Use in English Writing. English Language Teaching, 14(12), 23. https://doi.org/10.5539/elt.v14n12p23

Chon, Y. V., & Shin, S. (2020). Direct writing, translated writing, and machine-translated writing: A text level analysis with COH-metrix. English Teaching, 75(1), 25–48. https://doi.org/10.15858/engtea.75.1.202003.25

Clark J, Glasziou P, Del Mar C, Bannach-Brown A, Stehlik P, Scott AM. (2020). A full systematic review was completed in 2 weeks using automation tools: a case study. J Clin Epidemiol. 2020 Jan 28;121:81-90. doi: 10.1016/j.jclinepi.2020.01.008.

Demir, C. (2020). Teaching semantic considerations of ablative and locative cases in Turkish-to-English translated texts. Australian Journal of Applied Linguistics, 3(3), 233–254. https://doi.org/10.29140/ajal.v3n3.365

Deng, L. (2020). The Process-oriented Assessment Model of Business English Translation Course in a Flipped Learning Context. Higher Education Studies, 10(4), 1. https://doi.org/10.5539/hes.v10n4p1

Er, E. K. (2022). Project-based EFL learning at the tertiary level: research, translation, creativity and interaction. Turkish Journal of Education, 11(3), 162–182. https://doi.org/10.19128/turje.1061653

Farkas, A., & Németh, R. (2021). How to measure gender bias in machine translation: Real-world oriented machine translators, multiple reference points. Social Sciences & Humanities Open, 5(1), 100239. https://doi.org/10.1016/j.ssaho.2021.100239

Fernández-Costales, A., Talaván, N., & Tinedo, A. J. (2023). Didactic audiovisual translation in language teaching: Results from TRADILEX. Comunicar, 31(77). https://doi.org/10.3916/c77-2023-02

Fishman, E. (2021). What can translation do? Language, power, and identity in an elementary classroom. Journal of Language & Literacy Education, 17(1). https://files.eric.ed.gov/fulltext/EJ1300677.pdf

Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). How to design and evaluate research in education (8th ed.). McGraw-Hill Education.

Hidayat, A., & Helmanto, F. (2023). Translation teaching model in offline, online, and hybrid mode. JET (Journal of English Teaching), 9(1), 44–56. https://doi.org/10.33541/jet.v9i1.4448

Hussain, R. a. M. (2020). An analysis of undergraduate Saudi EFL female students' errors in written English essays. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.3512533

Ibrahim, M. a. E. (2022). EFL learners' syntactic problems in translation at AL-Baha University from Arabic into English. Arab World English Journal, 13(2), 239–252. https://doi.org/10.24093/awej/vol13no2.16

Jabu, B., Abduh, A., & Rosmaladewi, R. (2021). Motivation and challenges of trainee translators participating in translation training. International Journal of Language Education, 490–500. https://doi.org/10.26858/ijole.v5i1.19625

Janjaroongpak, K. (2020). Exploring potential correlation between CEFR Grammar profile in English and learners' overall grammar knowledge: an exploratory study of "that." Advances in Language and Literary Studies, 11(2), 59. https://doi.org/10.7575/aiac.alls.v.11n.2p.59

Jeharsae, F., & Boonsuk, Y. (2024). "I'll find it. . . or i'll look it up. . .?": decoding Thai EFL students' translation errors in the Thai-English language pair in multi-linguacultural higher education. rEFLections, 31(2), 670–691. https://doi.org/10.61508/refl.v31i2.275131

Kai, T. F., & Hua, T. K. (2021). Enhancing english language vocabulary learning among indigenous learners through google translate. Journal of Education and e-Learning Research, 8(2), 143–148. https://doi.org/10.20448/journal.509.2021.82.143.148

Karpushyna, M., Bloshchynskyi, I., Shumylo, I., Isaieva, I., & Mysechko, O. (2021). English linguistic competencies formation through specially designed border guards' practical training. Arab World English Journal, 12(2), 479–495. https://doi.org/10.24093/awej/vol12no2.33

Khonamri, F., Yaqubi, B., & Sokhandan, E. (2023). The potential of translanguaging pedagogy for promoting Iranian bilingual students' English development. Mextesol Journal., 46(4), 1–11. https://doi.org/10.61871/mj.v46n4-1

Kiatkheeree, P., Lueamsaisuk, C., & Kiatkiri, S. (2022). development of an English writing model: a guide to self-directed learning for local food product entrepreneur. International Education Studies, 15(4), 74. https://doi.org/10.5539/ies.v15n4p74Kim, C. (2022). Analysis of Korean-to-English machine translation Systems' treatment of passives. Journal of Pan-Pacific Association of Applied Linguistics, 26(1), 87–103. https://doi.org/10.25256/paal.26.1.5

Kitchenham, B. (2007). Guidelines for performing systematic literature reviews in software engineering (Technical Report EBSE-2007-01). Engineering Department, University of Durham.

Kim, E., & Oh, E. (2023). Machine translation use as translanguaging in content and language integrated learning: A case study in a General English course for global citizenship. English Teaching, 78(4), 59–82. https://doi.org/10.15858/engtea.78.4.202312.59

Kim, H., Rah, Y., & Hwang, H. (2020). Testing usage-based approaches to assessing EFL learners' development of English argument structure constructions. English Teaching, 75(0), 55–78. https://doi.org/10.15858/engtea.75.s1.202006.55

KiMsesiZ, F. (2022). EFL learners' performances on associating english proverbs with equivalent Turkish Proverbs: A Cross-Cultural Study. Acuity Journal of English Language Pedagogy Literature and Culture, 7(2). https://doi.org/10.35974/acuity.v7i2.2643

Köksal, O. (2020). Investigation of cultural competence development processes of English translation and interpretation department students. Journal of Language and Linguistic Studies, 16(2), 1070–1083. https://doi.org/10.17263/jlls.759369

Koralage, T., Choi, J., & Cross, R. (2023). Leveraging L2 academic writing: Digital translanguaging in higher education. TESOL in Context, 31(2). https://doi.org/10.21153/tesol2023vol31no2art1739

Lai, C., & Chang, L. (2023). The effects of students' employment of translation principles and techniques on English-Chinese sight translation performance: An eye-tracking and interview study. Social Sciences & Humanities Open, 8(1), 100542. https://doi.org/10.1016/j.ssaho.2023.100542

Lam, W. S., & Kennedy, J. (2005). Research methodologies and quality criteria in systematic reviews: An evaluation of approaches. Journal of Research Methodology, 14(2), 87-104.

Lee, Y. C., & Jwa, S. (2023). Feature importance ranking of translationese markers in L2 writing: A corpus-based statistical analysis across disciplines. English Teaching, 78(2), 55–81. https://doi.org/10.15858/engtea.78.2.202306.55

Leivada, E., Murphy, E., & Marcus, G. (2023). DALL·E 2 fails to reliably capture common syntactic processes. Social Sciences & Humanities Open, 8(1), 100648. https://doi.org/10.1016/j.ssaho.2023.100648

Li, J. (2020). An empirical study of Chinese EFL learners' understanding and translation of expressions of multiplication entailing "Times." English Language Teaching, 13(6), 58. https://doi.org/10.5539/elt.v13n6p58

Liang, C., Ghassemiazghandi, M., & Jamal, M. (2024). Post-editing challenges in Chinese-to-English neural machine translation of movie subtitles. Social Sciences & Humanities Open, 10, 100949. https://doi.org/10.1016/j.ssaho.2024.100949

Loock, R., & Holt, B. (2024). Augmented linguistic analysis skills: Machine translation and generative AI as pedagogical aids for analyzing complex English compounds. Technology in Language Teaching & Learning, 6(3), 1489. https://doi.org/10.29140/tltl.v6n3.1489

Lyu, J. (2020). The Modularized Construction on translation competence for Business English Majors in China. English Language Teaching, 13(7), 124. https://doi.org/10.5539/elt.v13n7p124

Maghsoudi, M., & Mirzaeian, V. (2020). Machine versus human translation outputs: Which one results in better reading comprehension among EFL learners? The JALT CALL Journal, 16(2), 69–84. https://doi.org/10.29140/jaltcall.v16n2.342

Margono, H., Saud, M., & Falahat, M. (2024). Virtual Tutor, Digital Natives and AI: Analyzing the impact of ChatGPT on academia in Indonesia. Social Sciences & Humanities Open, 10, 101069. https://doi.org/10.1016/j.ssaho.2024.101069

Meline, T. (2006). Systematic reviews: What they are and how they work. Research in Education, 76(2), 64-75.

Mohamed, K. A., & Halim, T. (2023). Smart-Phone assisted language learning in a public university in Saudi Arabia. International Journal of Language Education, 1(1), 120. https://doi.org/10.26858/ijole.v1i1.43135

Mohammadi, H., Beiki, M., & Keyvanfar, A. (2022a). The Impact of Back-translation Instruction with Collaborative Activities on Iranian English Students' Translation Achievement. IJELTAL (Indonesian Journal of English Language Teaching and Applied Linguistics), 7(1), 75. https://doi.org/10.21093/ijeltal.v7i1.1193

Mohammadi, H., Beiki, M., & Keyvanfar, A. (2022b). The impact of back-translation instruction with collaborative activities on Iranian English students' translation achievement. IJELTAL (Indonesian Journal of English Language Teaching and Applied Linguistics), 7(1), 75. https://doi.org/10.21093/ijeltal.v7i1.1193

Mohammed, O. S. M. M. S. M., Samad, S. S., & Mahdi, H. S. (2020). The attitudes of professional translators and translation students towards computer-assisted translation tools in Yemen. Journal of Language and Linguistic Studies, 16(2), 1084–1095. https://doi.org/10.17263/jlls.759371

Motlaq, M. D. A., & Mahadi, T. S. B. T. (2020). The attrition of common and distinctive English words in translator trainers. Cypriot Journal of Educational Sciences, 15(3), 575–586. https://doi.org/10.18844/cjes.v15i3.4570

Mpalami, N. (2022). Complexities of translating mathematics tasks from English to learners' home languages. Pythagoras, 43(1). https://doi.org/10.4102/pythagoras.v43i1.560

Olkhovska, A., & Frolova, I. (2020). Using machine translation engines in the classroom: a survey of translation students' performance. Advanced Education, 7(15), 47–55. https://doi.org/10.20535/2410-8286.197812

Okoli, C., & Schabram, K. (2010). A guide to conducting a systematic literature review of information systems research. Sprouts: Working Papers on Information Systems, 10(26), 1-49. https://sprouts.aisnet.org/10-26

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., ... & Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. BMJ, 372, n71. https://doi.org/10.1136/bmj.n71

Peng, X. (2021). Thinking path schema of english translation for chinese classics: an empirical study on translation schema in translation courses. English Language Teaching, 14(2), 56. https://doi.org/10.5539/elt.v14n2p56

Pham, A. T., Nguyen, L. T. D., & Pham, V. T. T. (2021). English language students' perspectives on the difficulties in translation: Implications for language education. Journal of Language and Linguistic Studies, 18(1). https://www.jlls.org/index.php/jlls/article/download/3136/961

Pornwiriyakit, P., & Dandee, W. (2022). Translation problems analysis and application of the grammar-translation method in EFL class. Journal of Educational Issues, 8(1), 572. https://doi.org/10.5296/jei.v8i1.19825

Powell, N., Baldwin, J., & Manning, J. (2022). Graduate STEM student perspectives and implementation of machine translators in South Korea. International Journal of Technology in Education and Science, 6(2), 237–253. https://doi.org/10.46328/ijtes.322

Puspani, I. a. M., & Indrawati, N. L. K. M. (2021). Challenges in translating Indonesian reduplication into English. Journal of Language and Linguistic Studies, 17(4), 1973–1983. https://doi.org/10.52462/jlls.143

Rashidi, A. N. B. M., Keikhosrokiani, P., Asl, M. P., & Oinas-Kukkonen, H. (2024). Computational analysis of dystopian elements in the partition fiction: A machine learning approach to the indian English novels. Social Sciences & Humanities Open, 10, 100897. https://doi.org/10.1016/j.ssaho.2024.100897

Rohani, S., & Suyono, A. (2021). Developing an android-based bilingual e-glossary application of English for Specific Purposes (ESP). English Language Teaching Educational Journal, 4(3), 225–234. https://doi.org/10.12928/eltej.v4i3.5209

Simatupang, E. C., & Supri, I. Z. (2024). Fusing translanguaging with speaking technology in the hospitality industry: Improving English communicative competence. Social Sciences & Humanities Open, 10, 101166. https://doi.org/10.1016/j.ssaho.2024.101166

Stoeckel, T., & Ishii, T. (2024). An exploratory criterion validation of three Meaning-Recall vocabulary test item formats. Deleted Journal, 12(1), 1–10. https://doi.org/10.29140/vli.v12n1.1233

Thowaini, B. M. A., & Qassem, M. (2024). The impact of an industry-driven translation training program on the performance of trainee translators. Cogent Arts and Humanities, 11(1). https://doi.org/10.1080/23311983.2024.2339618

Tongpoon-Patanasorn, A. (2020). Google Translate and Translation Quality: A Case of Translating Academic Abstracts from Thai to English. Deleted Journal, 60(1), 134–163. https://doi.org/10.58837/chula.pasaa.60.1.5

Van Nguyen, M. (2023). Google Translate for writing in an online English class: Vietnamese learners' perceptions and performances. The EuroCALL Review, 30(1), 5–17. https://doi.org/10.4995/eurocall.2023.18246

Vural, H. (2022). Do personality traits matter in preferences of translation strategies? Research in Social Sciences and Technology, 7(1), 42–55. https://doi.org/10.46303/ressat.2022.4

Waluyo, B., & Kusumastuti, S. (2024). Generative AI in student English learning in Thai higher education: More engagement, better outcomes? Social Sciences & Humanities Open, 10, 101146. https://doi.org/10.1016/j.ssaho.2024.101146

Werdiningsih, I., Marzuki, N., & Rusdin, D. (2024). Balancing AI and authenticity: EFL students' experiences with ChatGPT in academic writing. Cogent Arts and Humanities, 11(1). https://doi.org/10.1080/23311983.2024.2392388

Xiao, L., & Zeng, J. (2023). An Empirical study on the improvement of students' strategic competence through Translation project teaching. International Education Studies, 16(6), 123. https://doi.org/10.5539/ies.v16n6p123

Yagi, S., Fareh, S., Elnagar, A., Balajeed, M., El-Mneizel, A., & Al-Badawi, M. (2024). Is Arabic punctuation rule-governed? Cogent Arts and Humanities, 11(1). https://doi.org/10.1080/23311983.2024.2303818

Yao, C. W., Bush, T., Collins, C., Tuliao, M., Briscoe, K. L., & Dang, N. L. T. (2021). Exploring STEM undergraduate self-regulated learning at a Vietnamese transnational University. Journal of Comparative & International Higher Education, 13(1), 6–21. https://doi.org/10.32674/jcihe.v13i1.2203

Yoon, C. W., & Chon, Y. V. (2022). Machine translation errors and L2 learners' correction Strategies by error type and English proficiency. English Teaching, 77(3), 153–175. https://doi.org/10.15858/engtea.77.3.202209.153

Younus, N. N., & Ayub, N. N. (2023). Translation and adaptation of planned Happenstance career inventory in Urdu language. Journal of Education and Educational Development, 10(1), 50–71. https://doi.org/10.22555/joeed.v10i1.718

Zakeri, D. (2020). Improving technical translation ability of the Iranian students of translation through multimedia: An empirical study. Language Teaching Research Quarterly, 14, 94–106. https://doi.org/10.32038/ltrq.2020.14.07