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NAVIGATING THE POST-GEN AI ACADEMIC LANDSCAPE: EFL STUDENTS' FUNCTIONAL DIFFERENTIATION AND CRITICAL ENGAGEMENT WITH NMT AND CHATGPT

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ABSTRACT
The rapid expansion of Artificial Intelligence (AI) has normalized digital translation in higher education, yet its integration into English as a Foreign Language (EFL) pedagogy remains complicated by an institutional vacuum. Grounded in the Technology Acceptance Model and Cognitive Load Theory, this study examines university students' multi-tool strategies and critical engagement with Neural Machine Translation (NMT) and Generative AI (GenAI) platforms. Employing a convergent parallel mixed-methods design, quantitative data were gathered from 165 EFL undergraduates (73.7% female, 72.2% sophomores, 61.1% daily active users) via questionnaires, alongside semi-structured interviews with a purposive sub-sample (n=10).The findings reveal an advanced ecosystem characterized by functional differentiation: students strategically leverage specialized NMT engines like DeepL (38.9%) for academic precision but pivot to GenAI tools like ChatGPT (38.9%) for iterative conversational support. While students report high perceived usefulness (98.8%) and ease of use (96.1%) to minimize extraneous cognitive load, they reject passive consumption. Instead, 94.8% actively engage in critical post-editing due to systemic accuracy limitations regarding cultural nuances. Ethically, although 94.7% view automated assistance as an acceptable cognitive scaffold, the absence of clear institutional rules fosters a transparency gap, causing disclosure anxiety. This study dismantles the traditional narrative of student passivity and argues that higher education must move away from obsolete restrictions toward a framework of guided integration and structured translation literacy.

1. INTRODUCTION

Over the past decade, advances in Artificial Intelligence (AI) have significantly influenced the field of language acquisition, particularly through the development of Neural Machine Translation (NMT) (Batubara et al., 2025). Tools like Google Translate and DeepL have evolved from word-for-word translation tools into smart, sophisticated platforms that produce fluent, contextually appropriate translations (Moneus & Sahari, 2024). As a result, these tools have been widely used in university classrooms, especially among students in the English as a Foreign Language (EFL) context.

Despite its widespread use, the integration of Machine Translation (MT) into higher education remains controversial. According to Cognitive Load Theory, MT provides direct language support that can reduce learners' cognitive processing demands, facilitating text comprehension, vocabulary acquisition, and writing tasks (Plass et al., 2010; Ramadhani & Widiastuty, 2024; Zarifi & Azizinezhad, 2020). On the other hand, serious concerns persist

regarding learner overreliance, stunted independent language development, and academic integrity (Puppart & Aru, 2025). This tension reflects the discrepancy between institutional academic expectations and students' actual practices, creating uncertainty about the appropriate role of MT in the learning process.

To address this controversy with academic precision, it is critical to establish a clear distinction between dedicated Machine Translation (MT/NMT) platforms and emerging Generative Artificial Intelligence (GenAI) tools. While modern students regularly draw from both technologies, they operate on fundamentally distinct digital architectures and serve different functional roles in the learning process.

Traditional MT and NMT engines, such as DeepL and Google Translate, are specialized systems trained exclusively for cross-lingual mapping. Their primary function is localized, language-to-language conversion focused on achieving static semantic accuracy and syntactic fluency based on an existing source text.

Conversely, Generative AI tools, such as ChatGPT, are built on Large Language Models (LLMs) that transcend basic translation. GenAI does not merely translate text; it predicts, synthesizes, and generates entirely new linguistic content based on dynamic, conversational user prompts. In an academic workflow, while a student uses an NMT tool to decode a paragraph quickly, they use GenAI as an interactive, iterative writing consultant to request grammatical explanations, adjust stylistic tone, or brainstorm vocabulary alternatives. Distinguishing between these two technologies is essential for understanding the sophisticated, multi-tool digital ecosystems that contemporary students independently construct.

From a theoretical perspective, students' engagement with MT can be explained by the Technology Acceptance Model, particularly perceived usefulness and perceived ease of use (Cahyani et al., 2025; Edumadze et al., 2022). However, in addition to these factors, students' beliefs about the translation process and their attitudes towards digital translation are also important in shaping their behavior (Leva et al., 2025; S. Tian et al., 2023; Yudianto et al., 2025). While the technical effectiveness of digital translation tools has received considerable scholarly attention globally, a critical gap remains regarding how these tools are utilized within the specific socioeconomic and socio-educational realities of the Indonesian English as a Foreign Language (EFL) context. Unlike English as a Second Language (ESL) environments, where students enjoy regular target-language exposure, Indonesian university undergraduates operate in a foreign-language context in which English exposure is strictly restricted to institutional classrooms.

Furthermore, Indonesian EFL students face high academic reading demands, often requiring them to evaluate complex international journal articles and to compose advanced texts in a language in which they lack native or intuitive fluency. In this demanding environment, digital translation tools do not merely serve as an administrative luxury; they are a critical cognitive lifeline and a psychological scaffold that directly alleviates foreign language anxiety. Investigating how undergraduates independently navigate these advanced tools at an Indonesian state institution provides vital, underrepresented insights into how technology shapes learning in developing educational landscapes.

While previous studies have placed considerable emphasis on the effectiveness of digital translation tools (Duong & Ngan, 2025), limited attention has been given to how students

evaluate and interact with these tools across multiple dimensions in real-world learning contexts. Most prior studies remain limited by a binary "moral panic" narrative, heavily polarizing automated translation as either a purely positive pedagogical asset or a destructive "crutch" that induces cognitive laziness.

The novelty of this study lies in its move away from this simplistic dichotomy by implementing a convergent parallel mixed-methods design. Instead of treating the student as a passive recipient of automated output, this study views the learner as an active, strategic, and ethically aware agent who dynamically negotiates the role of technology in their daily learning routines. Furthermore, this research is uniquely positioned to capture the contemporary post-GenAI academic shift. By evaluating how students simultaneously combine traditional NMT engines (DeepL, Google Translate) with generative models (ChatGPT), this study unearths an emergent form of student "multitool literacy"—including specific post-editing behaviors, tool triangulation strategies, and self-regulated ethical boundaries—that remains unaccounted for in older, pre-GenAI technology acceptance literature.

To address this gap, the present study investigates university students' perceptions of MT through four key dimensions: (1) perceived usefulness in supporting comprehension, writing, vocabulary, grammar, and confidence; (2) perceived ease of use in terms of accessibility and effort; (3) perceptions of quality and accuracy, including reliability and awareness of limitations; and (4) attitudes and ethical perceptions regarding acceptable academic use. Accordingly, this inquiry is guided by the following three research questions:

1. What are the tool preferences, perceived usefulness, and perceived ease of use regarding digital translation and AI tools among Indonesian EFL undergraduate students?
2. How do these students evaluate the quality and accuracy limitations of machine translation, and to what extent do they actively engage in critical post-editing behaviors to overcome these limitations?
3. How do students strategically differentiate between various digital tools (e.g., DeepL, ChatGPT, Google Translate) for specific academic tasks, and how do they navigate the ethical disclosure dilemma within their institutional context?

Situated within the context of Indonesian higher education, this study aims to provide empirically grounded insights to support more balanced, pedagogically sound, and ethically informed integration of MT in language learning. While the existing literature has explored MT from technical, pedagogical, and ethical perspectives, there is limited research that integrates these dimensions into a comprehensive framework of student perceptions. Few studies simultaneously examine usefulness, ease of use, quality, and ethical considerations within a single empirical design, especially in the context of Indonesian higher education (Darmono et al., 2025; Raharjo & Rohmadi, 2025). Therefore, this study seeks to address this gap by providing a multidimensional analysis of students' perceptions of MT, combining quantitative and qualitative data to offer a more holistic and comprehensive understanding of its role in contemporary language learning.

2. LITERATURE REVIEW

2.1 The Debate Over MT as Learning Support vs. Learner Dependence

The integration of Machine Translation and Neural Machine Translation into higher education has sparked debate among educational researchers and applied linguists, with the discussion shifting from static questions of mere utility toward complex assessments of learner behavior (Abraheem, 2025; Sharma et al., 2023).

Proponents of this view argue that contemporary tools such as Google Translate and DeepL can produce texts that are highly fluent and context-sensitive, serving as practical self-learning aids rather than just tools for academic cheating (A'yun et al., 2025). Experts emphasize that students often use MT to support reading comprehension, vocabulary acquisition, and second language writing tasks (Delyana & Tedjasuksmana, 2023; Paterson, 2023). In this paradigm, MT serves as an autonomous linguistic scaffold, enabling learners of English as a Foreign Language (EFL) to cross-examine vocabulary and decipher dense, complex syntactic structures that would otherwise be difficult to access.

In contrast, a large body of literature warns of the long-term pedagogical harms of translation automation. Critics such as Anthony Pym (Pym & Hu, 2024) argue that an uncritical reliance on MT can permanently inhibit linguistic competence and alter authentic learning behavior. This side of the debate reminds us that over-reliance on translation automation can reduce learners' cognitive engagement with target-language syntax, potentially triggering "learner laziness" (Chen et al., 2025), in which students avoid the adaptation process and the effort required to produce texts (J. Tian & Zhang, 2025). Thus, the literature presents a real conflict between short-term task efficiency and long-term language mastery.

2.2 Cognitive Load Optimization vs. Mechanical Avoidance

To understand the psychological mechanisms that drive technology adoption, researchers often refer to Cognitive Load Theory, which raises another important debate about mental effort in language learning. The perspective of cognitive scaffolding holds that unnecessary reductions in cognitive load can significantly improve overall learning outcomes (Baxter et al., 2025). In complex academic reading and writing tasks, EFL students often experience excessive cognitive load due to unfamiliar vocabulary and complex grammar (Ulysa Humayrah et al., 2026). MT tools serve as crucial scaffolding devices that instantly handle these low-level mechanical jobs, simplifying complex linguistic inputs (Al-Adwan et al., 2023; Rahmawati et al., 2025) so that learners can allocate their limited working memory to analyze high-level semantic meanings, synthesis, and conceptual analysis. However, opposing researchers argue that this cognitive deficit is a form of mechanical avoidance rather than optimization. They state that the mental exertion required to struggle through vocabulary retrieval and grammatical decoding is not an "unnecessary" load, but rather the fundamental cognitive load needed to build long-term memory pathways (Abimbola, 2023). By automating this process, students may develop an artificial sense of comprehension without developing actual linguistic mastery (Khoso et al., 2025).

2.3 The Evolution of MT Quality, System Limitations, and Post-Editing Literacy

As translation technology has evolved from rule-based systems to neural machine translation (NMT) and generative artificial intelligence (Gen AI), the focus of research has also shifted. Rather than simply measuring translation accuracy, researchers are now studying how users critically interact with imperfect machine translations. There are clear differences between NMT tools, such as DeepL and Google Translate, and Gen AI tools, such as ChatGPT from OpenAI or Gemini from Google. NMT tools are primarily designed for accurate translation, while Gen AI

tools allow users to interact through suggestions and modify text in a more flexible and conversational way (Jiang et al., 2025). However, researchers explain that both NMT and Gen AI still struggle with idiomatic expressions, cultural meanings, and context (Alqohfa & Sanad, 2025). Therefore, a "human in the loop" approach is crucial. Users should not rely solely on machine translation results. Instead, they require translation literacy, which means critically reviewing, editing, comparing dictionary sources, and manually correcting translations to improve accuracy and meaning (Naveen & Trojovský, 2024).

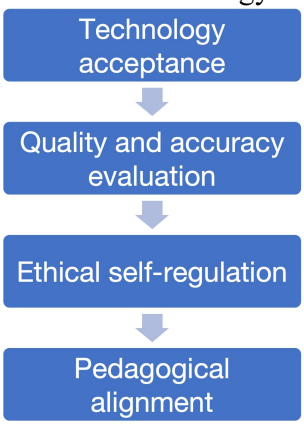
2.4 Technology Acceptance, Ethics, and Academic Integrity

The baseline behavior of technology adoption is heavily grounded in the Technology Acceptance Model (TAM), which posits that perceived usefulness (efficiency) and perceived ease of use (accessibility) are the primary determinants of whether a tool is integrated into daily routines (Braha, 2026). However, when applied to modern academic environments, TAM constructs directly collide with ethical anxieties.

The literature reports a profound gray area regarding what constitutes acceptable tool use (Gruenhagen et al., 2024). A strong consensus among students holds that using MT as a supplementary support tool (e.g., checking grammar or discovering vocabulary) is entirely ethical (Tran et al., 2025). However, using it to generate an entire assignment without individual cognitive engagement is considered plagiarism. This ethical self-regulation is complicated by an institutional vacuum, as there are no specific, transparent rules. Researchers consistently observe that university academic integrity codes lag significantly behind students' real-world digital workflows (Zlotnikova & Hlomani, 2025). This disconnect creates an environment of anxiety; even when students use MT responsibly as an auxiliary scaffold, they frequently experience discomfort and avoid disclosing its use to faculty due to vague, prohibitive, or punitive institutional guidelines.

2.5 Conceptual Framework

To comprehensively evaluate these interconnected debates, this study proposes a conceptual framework that connects four main dimensions. Instead of treating these dimensions as discrete variables, this framework models them as a sequential, dynamic cognitive ecosystem that governs students' interactions with translation technology.



3. METHODOLOGY

3.1. Research Design

The research follows a mixed-methods design, specifically employing a sequential explanatory approach. This design is chosen to provide a comprehensive understanding of university students' perceptions of Machine Translation (MT) by combining the breadth of quantitative data with the depth of qualitative insights (Lamont & Cirocki, 2025). The study began with quantitative data collection through a questionnaire to identify students' perceptions, experiences, and ethical considerations regarding the use of machine translation (MT) and AI-based translation tools. The quantitative findings were then followed by qualitative data collection through interviews to gain deeper insights into students' perspectives and practices. This design was considered appropriate because it enabled the researcher to explain and enrich the statistical findings with detailed participant experiences.

3.2 Participants

The participants of this study were 165 undergraduate students from the English Education Study Program at Universitas Negeri Semarang. The participants were selected using purposive sampling because the study specifically targeted students who had experience using machine translation or AI translation tools for academic purposes. The participants consisted of male and female students from different semesters.

3.3 Instruments

The primary instrument used in the quantitative phase was an online questionnaire distributed through Google Forms. The questionnaire consisted of several sections, including demographic information, frequency and purposes of MT use, perceptions of usefulness and ease of use, ethical considerations, post-editing practices, and attitudes toward institutional policies. The online questionnaire used a four-point Likert scale, ranging from strongly agree to strongly disagree. The questionnaire items were adapted from previous studies, with adjustments to the Technology Acceptance Model (TAM), machine translation literacy, and AI-assisted language learning. To ensure content validity, the questionnaire was reviewed by experts in translation and English education. Meanwhile, reliability was assessed using Cronbach's Alpha to evaluate the instrument's internal consistency. In the qualitative phase, semi-structured interviews were conducted to explore participants' experiences, concerns, and strategies when using MT and AI tools for academic writing and translation.

3.4 Data Collection Procedure

Data collection was conducted in two stages, following a sequential explanatory mixed-methods design. First, quantitative data were collected through an online questionnaire distributed via Google Forms to undergraduate students of the English Education Study Program at Universitas Negeri Semarang. The questionnaire collected demographic information and students' perceptions and experiences regarding the use of machine translation (MT) and generative AI tools.

After quantitative data analysis, 15 participants were selected for semi-structured interviews to gain deeper insights into their experiences and ethical perspectives on MT and AI use. The interviews were conducted online or in person with participants' consent and recorded for data analysis.

3.5 Data Analysis

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The quantitative data obtained from the questionnaire were analyzed using descriptive statistics, including percentages, frequencies, and mean scores, to identify patterns of students' use and perceptions of machine translation (MT) and generative AI tools. Meanwhile, the qualitative data from the interviews were analyzed using thematic analysis, which involved identifying, coding, and categorizing recurring themes. Finally, the quantitative and qualitative findings were integrated to provide a comprehensive understanding of students' experiences and perspectives regarding MT and AI use in academic contexts.

3.6 Ethical Considerations

This study adhered to ethical research principles throughout the study. Participants were informed of the study's purpose before participating, and their participation was voluntary. Informed consent was obtained from all participants, and anonymity and confidentiality were maintained by ensuring that personal information and responses were kept secure and used solely for academic research purposes.

4. RESULTS AND DISCUSSION

A total of 165 university students participated in this study. The demographic data provide an overview of participants' gender, academic level, frequency of Machine Translation (MT) use, and preferred MT tools.

Demographic Profile of the Respondents

Gender Distribution

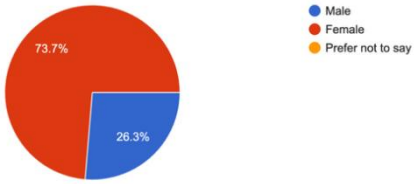

Chart 1. Gender distribution

The sample was predominantly female. Specifically, 73.7% (n = 122) of respondents identified as female, while 26.3% (n = 44) identified as male. No respondents selected the "prefer not to say" option. This indicates that the dataset is largely representative of female students.

Level of the Study

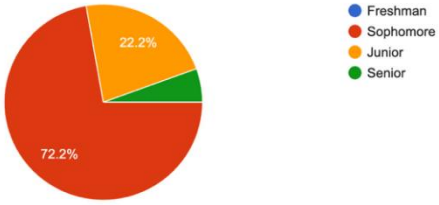

Chart 2. Level of the study

In terms of academic level, the majority of participants were sophomores (72.2%, n = 119), followed by juniors (22.2%, n = 37), and seniors (5.6%, n = 9). No respondents identified as freshmen. This suggests that the findings primarily reflect the perspectives of mid-level undergraduate students who are already familiar with academic tasks and digital tools.

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Frequency of the MT Use

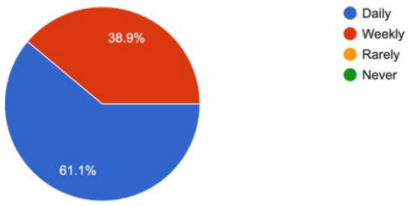

Chart 3. Frequency of the MT use

The results indicate a high level of engagement with MT tools among respondents. More than half of the participants (61.1%, n = 101) reported daily MT use, while 38.9% (n = 64) reported weekly use. Notably, none of the respondents selected "rarely" or "never," indicating that MT usage is ubiquitous among the participants.

Preferred Machine Translation Tools

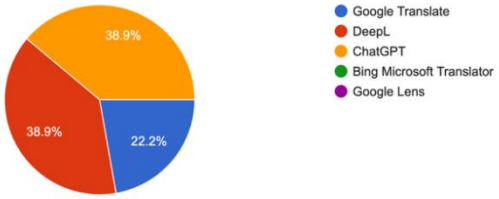

Chart 4. Preferred MT tools

Regarding tool preference, students reported using a range of MT applications. The most frequently preferred tools were DeepL and ChatGPT, each selected by 38.9% (n = 64) of respondents. Meanwhile, Google Translate was chosen by 22.2% of participants (n = 37). No respondents reported using Bing Translator or Google Lens as their primary tool. These findings suggest a shift toward more advanced AI-based tools, with students showing a strong preference for platforms perceived as more accurate and context-sensitive.

Students Perception

Perceived Usefulness (Utility)

Table 1. Perceived usefulness

No	Statement	Strongly Agree	Agree	Disagree	Strongly Disagree
1	Helps understand difficult texts	68.8%	31.3%	0%	0%
2	Helps complete assignments quickly	31.3%	68.8%	0%	0%
3	Used to learn new vocabulary/expressions	52.6%	47.4%	0%	0%
4	Helpful tool for checking grammar	31.3%	62.5%	6.3%	0%
5	Confident in language tasks with MT support.	52.6%	47.4%	0%	0%
AVG	**Overall Perceived Usefulness**	**47.3%**	**51.5%**	**1.2%**	**0%**

The findings indicate that students perceive Machine Translation (MT) as a highly beneficial tool in supporting their language learning and academic performance. Across all five items, responses are overwhelmingly positive, with almost no disagreement reported. All

respondents (100%) agreed that MT helps them understand difficult texts (68.8% strongly agree; 31.3% agree), confirming its central role in facilitating comprehension. Similarly, all participants acknowledged that MT helps them complete assignments more quickly (31.3% strongly agree; 68.8% agree), highlighting its contribution to efficiency in academic tasks.

Students also reported using MT as a learning resource, particularly for vocabulary acquisition, with 100% agreement (52.6% strongly agree; 47.4% agree). Regarding grammar support, a strong majority (93.8%) found MT helpful, while 6.3% expressed disagreement, suggesting that some students recognize limitations in grammatical accuracy. Additionally, all respondents (100%) indicated that they feel more confident in performing language tasks when supported by MT (52.6% strongly agree; 47.4% agree), pointing to its role in enhancing learner confidence. Overall, the average results show that 98.8% of respondents expressed positive perceptions (47.3% strongly agree; 51.5% agree), with only 1.2% indicating disagreement. This demonstrates that MT is widely viewed not only as a tool for task completion but also as a supportive learning aid that enhances comprehension, efficiency, and confidence.

From a theoretical perspective, these findings strongly support the perceived usefulness construct in the Technology Acceptance Model, indicating that students are highly likely to adopt MT because of its clear benefits for accomplishing academic tasks. Furthermore, the results align with Cognitive Load Theory, as MT appears to reduce cognitive effort and enable students to focus more effectively on understanding and completing language-related tasks.

Perceived Ease of Use

Table 2. Perceived ease of use

No	Statement	Strongly Agree	Agree	Disagree	Strongly Disagree
1	MT tools are very easy to navigate	47.4%	52.6%	0%	0%
2	Translating requires very little effort	21.1%	68.4%	10.5%	0%
3	Easy to get specific results looking for	31.6%	63.2%	5.3%	0%
4	Learning to use MT was simple/straightforward	36.8%	63.2%	0%	0%
AVG	**Overall Perceived Usefulness**	**34.2%**	**61.9%**	**3.9%**	**0%**

The findings demonstrate that students perceive Machine Translation (MT) tools as highly accessible and user-friendly. Across all items, responses are strongly concentrated in the "Agree" and "Strongly Agree" categories, indicating minimal difficulty in using MT for academic purposes. All respondents (100%) agreed that MT tools are easy to navigate (47.4% strongly agree; 52.6% agree), suggesting that interface design and usability do not present barriers to adoption. Similarly, all participants reported that learning how to use MT tools was straightforward (36.8% strongly agree; 63.2% agree), reinforcing the notion that these technologies require little prior training.

Regarding effort, most students (89.5%) agreed that translating with MT requires very little effort. In comparison, 10.5% disagreed, suggesting that some users may still experience challenges depending on task complexity or desired output quality. A similar pattern emerges in obtaining specific translation results: 94.8% responded positively, while 5.3% reported difficulty, suggesting that precision and contextual accuracy may not always be easily achieved. Overall,

the average results show that 96.1% of respondents expressed positive perceptions (34.2% strongly agree; 61.9% agree), with only 3.9% indicating disagreement. This confirms that MT tools are widely perceived as easy to use, efficient, and accessible.

From a theoretical standpoint, these findings strongly support the perceived ease of use construct within the Technology Acceptance Model, indicating that the simplicity and low effort required to operate MT tools contribute significantly to their widespread adoption among students.

Perception of Quality and Accuracy

Table 3. Perception of quality and accuracy

No	Statement	Strongly Agree	Agree	Disagree	Strongly Disagree
1	Believe MT translations are generally accurate	10.5%	68.4%	21.1%	0%
2	Trust MT for complex technical/academic terms	15.8%	68.4%	15.8%	0%
3	Often need to edit or correct the MT output	21.1%	73.7%	5.3%	0%
4	MT often fails to capture cultural nuance/tone	15.8%	68.4%	15.8%	0%
AVG	**Overall Perceived Usefulness**	**15.8%**	**69.7%**	**14.5%**	**0%**

The results show that students hold moderately positive but critical perceptions regarding the quality and accuracy of Machine Translation (MT). While most responses fall into the "Agree" category, a noticeable proportion of responses indicate disagreement, suggesting that students are aware of the limitations of MT output. Most respondents (78.9%) believe that MT translations are generally accurate, while 21.1% disagreed, suggesting that trust in MT is not absolute. Similarly, 84.2% of students trust MT to translate complex or technical terms, while 15.8% remain skeptical, reflecting uncertainty about specialized language.

Importantly, the findings reveal a strong awareness of MT limitations. A significant 94.8% of respondents agreed that they often need to edit or correct MT output, indicating that students do not passively accept translations but actively engage in post-editing. In addition, 84.2% agreed that MT fails to capture cultural nuance or tone, highlighting a key weakness in its handling of pragmatic and context-sensitive aspects of language. Overall, the average results indicate that 85.5% of respondents expressed positive agreement (15.8% strongly agree; 69.7% agree), while 14.5% expressed disagreement. This suggests that although MT is generally trusted, students adopt a cautious and evaluative approach when using it.

From a theoretical perspective, these findings reflect the importance of perceived reliability in technology use, extending beyond the basic constructs of the Technology Acceptance Model. While students recognize the usefulness and ease of MT, their trust is moderated by an understanding of its limitations. This aligns with discussions in translation studies, where scholars such as Philipp Koehn emphasize that even advanced MT systems may struggle with contextual accuracy and cultural meaning.

Attitudes and Ethical Perceptions

Table 4. Attitudes and ethical perceptions

No	Statement	Strongly Agree	Agree	Disagree	Strongly Disagree
1	MT for academic assignments is ethically acceptable.	15.8%	78.9%	5.3%	0%
2	Concerned that MT might hinder long-term learning.	31.6%	63.2%	5.2%	0%
3	MT should be a supplement, not a replacement.	57.9%	36.8%	5.3%	0%
4	Comfortable telling instructor I used MT.	10.5%	68.4%	21.1%	0%
AVG	**Overall Ethical Stance**	**29.0%**	**61.8%**	**9.2%**	**0%**

The findings suggest that students hold a generally positive but cautious ethical stance toward the use of Machine Translation (MT) in academic contexts. While most respondents consider MT acceptable, their responses also reflect clear awareness of its potential risks and appropriate boundaries. A large majority of students (94.7%) agreed that using MT for academic assignments is ethically acceptable (15.8% strongly agree; 78.9% agree), indicating broad acceptance of MT as part of academic practice. However, this acceptance is not unconditional.

Notably, 94.8% of respondents expressed concern that MT may hinder long-term language learning, suggesting that students are aware of the potential negative impact of overreliance on MT. The strongest consensus in this dimension further reinforces this concern: 94.7% of students agreed that MT should function as a supplementary tool rather than a replacement for their own effort, with a majority (57.9%) strongly supporting this view. This indicates a clear recognition of responsible and balanced use. However, a more nuanced pattern emerges regarding transparency. While 78.9% of respondents reported being comfortable disclosing MT use to their instructors, 21.1% expressed discomfort, suggesting lingering uncertainty or perceived stigma around MT use in academic work. Overall, the average results show that 90.8% of respondents agreed (29.0% strongly agree; 61.8% agree), while 9.2% disagreed. This reflects a predominantly positive ethical perception, tempered by caution and self-awareness.

From a theoretical standpoint, these findings highlight that students' use of MT is not solely driven by utility or ease, as the Technology Acceptance Model suggests, but is also shaped by ethical considerations and personal responsibility. Students appear to negotiate a balance between leveraging technological support and maintaining academic integrity.

Discussion

The findings of this study reveal that university students demonstrate a high level of acceptance of Machine Translation (MT), supported by strong perceptions of usefulness and ease of use, and generally positive attitudes toward its integration in academic contexts. Importantly, these findings are consistent with and extend previous research in both applied linguistics and educational technology.

Perceived Usefulness and Cognitive Support

The findings revealed that most students perceived machine translation (MT) and generative AI tools as useful in supporting academic activities. Students commonly use these tools to check grammar, understand unfamiliar vocabulary, generate sentence structures, and improve writing

efficiency. The high frequency of MT use among participants indicates that digital translation tools have become an important cognitive support system in language learning (Comelles & Laso, 2025). This finding suggests that students view MT and AI not merely as translation tools but as learning assistants that help reduce linguistic difficulties and increase academic productivity. The result aligns with the Technology Acceptance Model (TAM), which posits that technology adoption is strongly influenced by perceived usefulness and ease of use driven by its ability to enhance task performance (Davis, 1989).

The finding is consistent with previous studies showing that students use MT to facilitate comprehension, enhance confidence, and accelerate writing processes (Klimova, 2025). Similar research has also reported that students perceive AI-assisted tools as helpful in reducing cognitive load during language-learning tasks (Torres & Kahveci, 2025). However, prior studies also warn that excessive reliance on AI-generated outputs may weaken independent learning and critical thinking skills (Zhai et al., 2024).

From a pedagogical perspective, lecturers should integrate MT and AI literacy into English-language instruction rather than completely prohibiting their use. Students need guidance on how to use these tools critically and responsibly. Nevertheless, caution is necessary because overreliance on automated tools may reduce students' ability to construct language independently.

Strategic Use and Digital Literacy

The findings demonstrated that students used MT and generative AI strategically for various academic purposes, including paraphrasing, vocabulary checking, translation comparison, and idea generation. Many participants reported combining multiple digital resources rather than depending on a single tool. This finding indicates that students are developing digital literacy and translation literacy in response to the growing presence of AI technologies in education (Breskas et al., 2025). Students no longer function as passive users of technology but as active evaluators who select tools based on their academic needs. The result aligns with previous studies, which emphasize that effective AI use requires strategic digital competence and critical awareness (Onnen, 2024). Similar studies have shown that students increasingly employ multiple online resources to verify meaning, improve translation accuracy, and refine academic writing (Metwally et al., 2025).

The implication for teaching is that educators should focus on developing students' digital literacy skills, particularly in evaluating the reliability and limitations of AI-generated outputs. However, students' strategic use does not always guarantee accurate understanding, as some participants still relied heavily on AI suggestions without sufficient evaluation.

Critical Evaluation and Post-Editing

The findings showed that many students engaged in post-editing practices after using MT and AI tools. Participants frequently revised vocabulary choices, corrected sentence structure, and checked the contextual meaning of their work before submitting academic work. This finding suggests that students are aware of the limitations of MT and generative AI, particularly in terms of contextual meaning, idiomatic expressions, and cultural nuances. The use of post-editing demonstrates that human judgment remains essential despite technological advancements. The finding supports previous research arguing that MT and AI outputs require active human

evaluation and revision (Herget, 2021). Scholars have consistently emphasized that post-editing has become an important skill in AI-assisted language learning and translation practices.

From a teaching perspective, students should be trained not only to use MT tools but also to evaluate and revise AI-generated texts critically. However, post-editing quality varied among participants, indicating differences in language proficiency and digital literacy.

Ethical Self-Regulation and the Policy Gap

The findings revealed that most students considered the use of MT ethically acceptable when it functioned as a learning support tool, such as for checking grammar or vocabulary. However, participants generally viewed using AI to complete entire assignments without personal effort as academically unethical. This finding indicates that students possess forms of ethical self-regulation regarding MT and AI use. At the same time, many participants expressed uncertainty about institutional policies and boundaries concerning acceptable AI-assisted academic practices. The result is consistent with previous studies reporting a gap between university academic integrity policies and students' actual digital learning practices (Lodge, 2024). Similar research has shown that unclear institutional regulations often create anxiety among students, even when they use AI tools responsibly (Munawaroh, 2024).

The implication is that universities should establish clearer, more balanced guidelines for the ethical use of MT and generative AI in education. Nevertheless, ethical perceptions may differ across individuals and academic contexts, meaning that institutional policies should remain flexible and educational rather than purely punitive.

Language Learning in the AI Age

The findings indicated that MT and generative AI tools have become integrated into students' language learning processes. Students viewed these technologies not only as translation tools but also as resources for improving writing, comprehension, and academic efficiency. This finding suggests that language learning in the AI era is increasingly characterized by collaboration between human learners and intelligent technologies. Students interact with AI-generated feedback and assistance in their everyday academic practices. The result supports recent studies arguing that AI technologies are transforming language education and reshaping students' learning strategies (Adair, 2023). However, previous research also highlights concerns that excessive reliance on AI may reduce independent problem-solving abilities and weaken authentic language production (Zhai et al., 2024).

From a pedagogical perspective, English language education should move beyond simply banning or allowing AI use. Instead, educators should emphasize critical AI literacy, ethical awareness, and reflective learning practices. However, this study is limited to students from a specific academic context, so the findings may not fully represent broader educational settings..

5. CONCLUSION

This study examined university students' perceptions of Machine Translation (MT) and generative AI tools regarding usefulness, ease of use, quality and accuracy, and ethical considerations. The findings revealed that students generally perceived MT tools such as Google Translate, DeepL, and ChatGPT as useful and accessible, supporting vocabulary learning,

grammar checking, comprehension, and academic writing. Although students frequently relied on these tools, they also recognized their limitations, particularly in terms of contextual meaning, cultural nuance, and translation accuracy. Most participants reported revising AI-generated outputs through post-editing practices, showing that they remained actively involved in the learning process.

The study contributes theoretically to discussions on the Technology Acceptance Model (TAM), digital literacy, and AI-assisted language learning by demonstrating that students' acceptance of MT is influenced not only by usefulness and ease of use, but also by ethical awareness and critical evaluation. The findings also suggest that students are not passive users of technology, but rather reflective users who negotiate between technological assistance and independent learning.

Practically, the study highlights the importance of integrating AI literacy, translation literacy, and ethical awareness into English language teaching. Instead of completely restricting MT use, educators should guide students in using these tools critically and responsibly in academic contexts.

However, this study was limited to participants from a single academic setting and relied primarily on self-reported data, which may not fully reflect students' actual practices. Therefore, future research is recommended to involve a more diverse range of participants from different academic backgrounds and to investigate the long-term impact of MT and generative AI on language learning, critical thinking, and academic performance.

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REFERENCES
A'yun, S. Q., Karim, S. A., Matas, G., Radjaban, R. ., & Winarna. (2025). The use of DeepL as a translation tool in English language learning: Insights from Indonesian EFL university students. *Journal of English Teaching and Learning Issues*, *8*(2), 177– 192. https://doi.org/10.21043/jetli.v8i2.33633

Abimbola, L. I. (2023). The Impact of Machine Translation on Vocabulary Acquisition and Reading Comprehension in ESL Learners. *Pulchra Lingua: A Journal of Language Study, Literature & Linguistics*, *2*(2), 80–93. https://doi.org/10.58989/plj.v2i2.27

Abraheem, A. K. H. Q. M. (2025). The Role of Machine Translationin Language Learning and Teaching. *International Journal of Linguistics Studies*, *5*(3), 1– 6. https://doi.org/10.32996/ijls.2025.5.3.1

Adair, A. (2023). Teaching and Learning with AI: How Artificial Intelligence is Transforming the Future of Education. *XRDS: Crossroads, The ACM Magazine for Students*, *29*(3), 7–9. https://doi.org/10.1145/3589252

Al-Adwan, A. S., Li, N., Al-Adwan, A., Abbasi, G. A., Albelbisi, N. A., & Habibi, A. (2023). Extending the Technology Acceptance Model (TAM) to Predict University Students' Intentions to Use Metaverse-Based Learning Platforms. *Education and Information Technologies*, *28*(11), 15381–15413. https://doi.org/10.1007/s10639-023-11913-3

Alqohfa, K. A. S., & Sanad, S. N. T. (2025). Linguistic and Cultural Challenges in Translating Idioms with Artificial Intelligence. *Journal of English Studies in Arabia Felix*, *4*(1), 34–49. https://doi.org/10.56540/jesaf.v4i1.116

Batubara, M. H., Sibarani, B., Murni, S. M., & Aisyah Ginting, S. (2025). A Systematic Literature Review on the Application of Artificial Intelligence in Translation: Challenges, Innovations, and Impact Across Diverse Fields. *Journal of Linguistics, Literature, and Language Teaching (JLLLT)*, *5*(1), 67–87. https://doi.org/10.37249/jlllt.v5i1.934

Baxter, K. A., Sachdeva, N., & Baker, S. (2025). The Application of Cognitive Load Theory to the Design of Health and Behavior Change Programs: Principles and Recommendations. *Health Education and Behavior*, *52*(4), 469– 477. https://doi.org/10.1177/10901981251327185

Braha, M. (2026). Kosovan EFL students' acceptance of AI tools for English language learning: practices, perceptions, challenges, and suggestions for improvement. *Innovation in Language Learning and Teaching*, *1229*, 1– 25. https://doi.org/10.1080/17501229.2026.2621266

Breskas, A., Hansen-Schirra, S., & Kapnas, D. (2025). AI and digital literacy in translation competence development. *SKASE Journal of Translation and Interpretation*, *18*(2), 117–148. https://doi.org/10.33542/jti2025-s-7

Cahyani, R. D., Syamdianita, S., Aridah, A., Iswari, W. P., & Ahada, I. (2025). EFL STUDENTS' ACCEPTANCE OF DEEPL TRANSLATION: A TECHNOLOGY ACCEPTANCE MODEL STUDY. *Lire Journal (Journal of Linguistics and Literature)*, *9*(3). https://doi.org/10.33019/ire.v9i3.535

Chen, Y., Wang, Y., Wüstenberg, T., Kizilcec, R. F., Fan, Y., Li, Y., Lu, B., Yuan, M., Zhang, J., Zhang, Z., Geldsetzer, P., Chen, S., & Bärnighausen, T. (2025). Effects of generative artificial intelligence on cognitive effort and task performance: study protocol for a randomized controlled experiment among college students. *Trials*, *26*(244), 1– 16. https://doi.org/10.1186/s13063-025-08950-3

Comelles, E., & Laso, N. J. (2025). The impact of MT as a writing tool on EFL academic writing: A qualitative linguistic analysis. *Journal of Second Language Writing*, *69*, 1– 14. https://doi.org/10.1016/j.jslw.2025.101231

Darmono, Setiawan, R. J., & Ma' ruf, K. (2025). Determining Factors Influencing Indonesian Higher Education Students' Intention to Adopt Artificial Intelligence Tools for Self-Directed Learning Management. *European Journal of Educational Research*, *14*(3), 805–828. https://doi.org/10.12973/eu-jer.14.3.805

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly: Management Information Systems*, *13*(3), 319–340. https://doi.org/10.2307/249008

Delyana, D., & Tedjasuksmana, H. (2023). The use of Google Translate on EFL students' language use in Writing and Attitudes. *Beyond Words*, *11*(2), 1– 29. https://doi.org/10.33508/bw.v11i2.4855

Duong, H. T. Q., & Ngan, H. T. Q. (2025). Online Technology Tools: Use and Perception by Vietnamese Students in a Translation Class. *CALL-EJ*, *26*(4), 258– 282. https://doi.org/https://doi.org/10.54855/

Edumadze, J., Ditlhokwa, G., & Demuyakor, J. (2022). Students' Acceptance and Perceptions of Perceived Usefulness of Mobile Learning Devices in Higher Educational Institutions. *Online Journal of Communication and Media Technologies*, *12*(2), 1– 14. https://doi.org/10.30935/ojcmt/11539

Gruenhagen, J. H., Sinclair, P. M., Carroll, J. A., Baker, P. R. A., Wilson, A., & Demant, D. (2024). The rapid rise of generative AI and its implications for academic integrity: Students' perceptions and use of chatbots for assistance with assessments. *Computers and Education: Artificial Intelligence*, *7*. https://doi.org/10.1016/j.caeai.2024.100273

Herget, K. (2021). Post-editing Machine Translation in MateCat: A classroom experiment. *International Conference on Higher Education Advances*, 1003– 1009. https://doi.org/10.4995/HEAd21.2021.12789

Jiang, L., Wei, B., & Al-Shaibani, G. K. S. (2025). Effective Neural Machine Translation with Human Post-Editing of Chinese Intangible Cultural Heritage Corpus into English. *Sage Open*, *15*(4), 1–15. https://doi.org/10.1177/21582440251386954

Khoso, A. K., Honggang, W., & Darazi, M. A. (2025). Empowering creativity and engagement: The impact of generative artificial intelligence usage on Chines EFL students' language learning experience. *Computers in Human Behavior Reports*, *18*, 1– 14. https://doi.org/10.1016/j.chbr.2025.100627

Klimova, B. (2025). Use of machine translation in foreign language education. *Cogent Arts and Humanities*, *12*(1), 1–14. https://doi.org/10.1080/23311983.2025.2491183

Lamont, J., & Cirocki, A. (2025). Talking to algorithms, not students: Students' and lecturers' perceptions of machine translation in academic discussion. *The JALT CALL Journal*, *21*(3), 1–31. https://doi.org/10.29140/jaltcall.v21n3.103256

Leva, B., Onič, T., Todorović, T., Urh, J., & Hazemali, D. (2025). Student Perceptions of Digital Tools in Language and Translation Programs: A Survey-Based Case Study at the University of Maribor, Slovenia. *Education Sciences*, *15*(9), 1– 24. https://doi.org/10.3390/educsci15091119

Lodge, J. M. (2024). The evolving risk to academic integrity posed by generative artificial intelligence: Options for immediate action. In *Tertiary Education Quality and Standards Agency*.

Metwally, A. A., Busabaa, N. A., & Mohammed, H. A. N. (2025). University Students' Diverse Perspectives on Google Translate: Enhancing EFL Writing Skills or Hindering Progress? *An-Najah University Journal for Research - B (Humanities)*, *39*(10), 841– 858. https://doi.org/10.35552/0247.39.10.2450

Moneus, A. M., & Sahari, Y. (2024). Artificial intelligence and human translation: A contrastive study based on legal texts. *Heliyon*, *10*(6), 1– 14. https://doi.org/10.1016/j.heliyon.2024.e28106

Moqbel, D. M. (2025). Impact of AI-Based Personalized English Learning on Cognitive Offloading and Breadth of Formal Curriculum. *Journal of English Studies in Arabia Felix*, *4*(2), 50–64. https://doi.org/10.56540/jesaf.v4i2.127

Munawaroh, S. (2024). Exploring EFL Students' Experiences In Using AI tools to support academic writing. *Socius: Jurnal Penelitian Ilmu-Ilmu Sosial*, *2*(7), 163– 174. https://doi.org/10.5281/zenodo.17605850

Naveen, P., & Trojovský, P. (2024). Overview and challenges of machine translation for contextually appropriate translations. In *iScience* (Vol. 27, Issue 10, pp. 1– 25). https://doi.org/10.1016/j.isci.2024.110878

Onnen, A. (2024). Artificial Intelligence (AI) and Future Skills-An Integrative Competency Model. *International Journal of Swarm Intelligence and Evolusionary Computation*, *13*(5), 1–18.

Paterson, K. (2023). Machine translation in higher education: Perceptions, policy, and pedagogy. *TESOL Journal*, *14*(2). https://doi.org/10.1002/tesj.690

Plass, J. L., Moreno, R., & Brünken, R. (2010). Cognitive load theory. In R. B. R. Plass, Jan L. ; Moreno (Ed.), *Cambridge University Press*. https://doi.org/10.1017/CBO9780511844744

Puppart, B., & Aru, J. (2025). Short-term AI literacy intervention does not reduce over-reliance on incorrect ChatGPT recommendations. *PREPRINT*, 1– 33. https://doi.org/10.48550/arXiv.2503.10556

Pym, A., & Hu, K. (2024). Machine Translation. An Overview. In *Reference Module in Social Sciences*. https://doi.org/10.1016/b978-0-323-95504-1.00014-4

Raharjo, R. S., & Rohmadi, S. H. (2025). Artificial Intelligence in Indonesian Education: A Critical Review of Ethical Considerations, Implementation Challenges, and Educational Management Perspectives. *At-Tarbawi: Jurnal Kajian Kependidikan Islam*, *10*(1), 50–68.

Rahmawati, S., Baihaqi, A., & Imtihanudin, D. (2025). Students' Perception of Using Machine Translation: A Survey of Indonesian EFL Undergraduate Students. *Journal of English Language Teaching and Cultural Studies*, *8*(1), 45– 54. https://doi.org/10.48181/jelts.v8i1.28792

Ramadhani, S. R., & Widiastuty, H. (2024). Understanding the Impact of Cognitive Load on Vocabulary Retention in Efl : a Theoretical Analysis. *International Proceddings Universitas Tulungagung 2024*, 651–664.

Sharma, S., Diwakar, M., Singh, P., Singh, V., Kadry, S., & Kim, J. (2023). Machine Translation Systems Based on Classical-Statistical-Deep-Learning Approaches. In *Electronics (Switzerland)* (Vol. 12, Issue 7, pp. 1–29). https://doi.org/10.3390/electronics12071716

Tian, J., & Zhang, R. (2025). Learners' AI dependence and critical thinking: The psychological mechanism of fatigue and the social buffering role of AI literacy. *Acta Psychologica*, *260*,

1–9. https://doi.org/10.1016/j.actpsy.2025.105725

Tian, S., Jia, L., & Zhang, Z. (2023). Investigating students' attitudes towards translation technology: The status quo and structural relations with translation mindsets and future work self. *Frontiers in Psychology*, *14*, 1–16. https://doi.org/10.3389/fpsyg.2023.1122612

Torres, P. J., & Kahveci, Y. E. (2025). Effectiveness of Artificial Intelligence (AI) in language teaching. *Computers and Education: Artificial Intelligence*, *9*, 1– 12. https://doi.org/10.1016/j.caeai.2025.100522

Tran, H., Crosthwaite, P., & Pham, Q. H. P. (2025). Students' self-determination in using machine translation and generative AI tools for English for academic purposes. *Journal of English for Academic Purposes*, *78*, 1–17. https://doi.org/10.1016/j.jeap.2025.101578

Ulysa Humayrah, Novita Ritonga, Afia Nur Meiza, & Yani Lubis. (2026). Sentence Processing Difficulties in Academic English: A Psycholinguistic Study of EFL Students. *International Journal Multidisciplinary Science*, *5*(1), 28–33. https://doi.org/10.56127/ijml.v5i1.2502

Yudianto, H., Surtikanti, M., & Agung, A. (2025). Students' Viewpoint of Automatic Translation Tools in EFL Classroom. *Pedagogy : Journal of English Language Teaching*, *13*(1), 37–63. https://doi.org/10.32332/joelt.v13i1.10482

Zarifi, A., & Azizinezhad, Z. (2020). Vocabulary learning and retention: Cognitive load framework on trial. *Porta Linguarum*, *2020*(33), 265– 278. https://doi.org/10.30827/portalin.vi33.26660

Zhai, C., Wibowo, S., & Li, L. D. (2024). The effects of over-reliance on AI dialogue systems on students' cognitive abilities: a systematic review. *Smart Learning Environments*, *11*(1), 1–37. https://doi.org/10.1186/s40561-024-00316-7

Zlotnikova, I., & Hlomani, H. (2025). GenAI in the Context of African Universities: A Crisis of Tertiary Education or Its New Dawn? *Digital Government: Research and Practice*, *6*(2), 1–11. https://doi.org/10.1145/3689215