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# Beyond the Dictionary: Redefining Translation Education with Artificial Intelligence-Assisted App Design and Training

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**Abstract.** This study addresses researchers' concerns about the effectiveness of integrating AI-assisted app design and training into university-level translation courses. It aims to explore how this integration influences students' motivation, reflective practices, academic performance, and the quality of language translation. Employing a mixed-methods research approach with a two-group post-test-only design, the study uncovers the transformative influence of integrating an AI-based translation assistant. Purposive sampling techniques were utilised to conduct interventions and focus groups with students

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majoring in Philology enrolled in the 3 ECTS course in Industry-Specific Translation at Taras Shevchenko National University of Kyiv. The findings from the Independent Samples t-test revealed significant improvements in motivation, reflective practices, academic performance, and translation quality among students in the experimental group (EG) compared to the control group (CG). Thematic analysis using the Speak web-based tool indicated an overall positive sentiment (0.224), highlighting Positive and Very Positive sentiments. The Neutral category suggested a balanced perspective, while the combined Slightly Negative and Negative categories represented less favourable sentiment. This research contributes valuable insights to the discourse on AI in language education by addressing gaps in related literature. We suggest avenues for future research into linguistic nuances and contextual challenges, advocating ongoing exploration to maximise the benefits of these technological interventions. Ultimately, this study provides a comprehensive understanding of the impact of AI integration in language education and underscores the need for continued exploration and adaptation in this area.

**Keywords:** AI-assisted translation; education technology; translation course; educational impact of AI

## 1. Introduction

The traditional approaches to translation education, primarily relying on dictionaries and manual linguistic analysis, have long been foundational methods for imparting language structures and vocabulary. However, these methods often fall short of adequately preparing learners for the multifaceted challenges of real-world translation tasks (Liu, 2013; Muttalib M. Jawad, 2020). Notably, they struggle to address context-specific nuances, accommodate cultural differences, and keep pace with the dynamic evolution of language (Zainudin & Awal, 2012; Zhao, 2023), thus revealing a significant research gap within existing translation education methodologies. This gap poses a considerable hindrance to learners in acquiring the necessary skills to meet the demands of contemporary translation tasks effectively.

The escalating demand for skilled translators in professional settings underscores the urgency to bridge this gap by equipping learners with adept skills and tools aligned with modern requirements (Abdel Latif, 2020; Al-Qinai, 2010; Kobayakova & Shvachko, 2016). Consequently, there is a pressing need for alternative approaches capable of effectively addressing these shortcomings and better preparing learners for the challenges posed by modern translation tasks. AI-assisted app design and training emerge as promising solutions to fill this research gap within traditional translation education (Chaudhry & Kazim, 2022; Kopp & Thomsen, 2023). Leveraging the capabilities of Artificial Intelligence, these applications can analyse extensive linguistic data, including corpora, parallel texts, and online resources, thereby providing learners with comprehensive and up-to-date information. By doing so, they address the deficiencies of traditional approaches and contribute to bridging the identified research gap.

However, despite the potential of AI-assisted methodologies, including virtual reality (VR) simulations and machine-learning algorithms to transform translation education, a need remains for a more comprehensive understanding of their impact. This study aims to delve deeper into the transformative potential of AI-assisted methodologies by examining their integration's feasibility, relevance, and impact on translation education. Through a thorough exploration of these methodologies, the study seeks to contribute valuable insights to the ongoing discourse at the intersection of education, technology, and translation studies, ultimately aiming to enhance translation education for contemporary needs.

## **2. Literature review**

### *Conventional approaches and challenges in translation education methods*

The theoretical framework guiding this study is grounded in the exploration of conventional approaches and challenges in translation education methods, as delineated in the existing literature. Traditionally, translation education has relied heavily on established methods such as dictionaries, manual linguistic analysis, and classroom instruction (Zanettin & Rundle, 2022; Man et al., 2022). These methods have played pivotal roles in establishing a robust linguistic foundation, enriching vocabulary, and imparting theoretical knowledge of language structures (Boulton & De Cock, 2017; Malmkjær, 2017; Abdel Latif, 2020). Nonetheless, they often fail to sufficiently equip learners for the intricacies of real-world translation assignments, especially in handling context-specific subtleties, cultural distinctions, and the evolving nature of language (Marais & Meylaerts, 2018; Stoian & Şimon, 2018).

Industry demands for more agile and innovative approaches to translation education highlight the imperative for a paradigm shift (Massey, 2018; Wu et al., 2019). Wang (2023) suggests that integrating technology, particularly artificial intelligence (AI)-assisted app design and training, holds promise for addressing these challenges and redefining translation education. Therefore, the theoretical framework of this study is informed by an acknowledgment of the limitations of traditional educational methodologies and the potential of AI-assisted approaches to bridge the gap between theory and practice in translation education.

Informed by this theoretical perspective, the research questions and methodology of the study are designed to explore the transformative potential of AI-assisted app design and training in translation education. By investigating the impact of AI-assisted methodologies on students' motivation, reflective practices, academic performance, and the quality of written translation, the study aims to address the shortcomings of traditional approaches and contribute to the ongoing discourse on technology integration in education. Through this lens, the theoretical framework informs the formulation of research inquiries and guides the selection of appropriate research methods, emphasising the importance of bridging theory with practical application in translation education.

In expanding the discussion to relevant empirical studies, it becomes evident that several investigations have examined the intersection of technology and language education, shedding light on various aspects of AI's role in enhancing learning

outcomes. For instance, Schmidt and Strasser (2022) delve into the potential of AI in addressing the shortcomings of traditional language teaching methods, emphasising its adaptive, personalised, and real-world relevance. Similarly, Dai and Wu (2023) explore the impact of AI-driven language learning applications, highlighting their capacity to provide tailored content and exercises, leading to improved language proficiency.

Moreover, Hellmich and Vinall (2021) investigated innovative approaches integrating AI technologies into translation education, such as translation exercises augmented by AI feedback and virtual language labs with AI-assisted simulations. Their findings underscored the potential benefits of these approaches, including improved student engagement and more dynamic learning experiences. In contrast, studies by Rebolledo Font de la Vall and González Araya (2023) highlighted some of the challenges associated with AI-driven language learning applications, such as the need for careful consideration of user experience and potential ethical concerns. These empirical studies collectively contribute to our understanding of the research topic by providing insights into the potential benefits and challenges of AI integration in language education. While some studies emphasise the positive impact of AI on learning outcomes and student engagement, others stress the importance of addressing potential drawbacks and ethical considerations. Aligned with the objectives of the current study, these findings emphasise the importance of examining the transformative potential of AI-assisted methodologies in translation education and provide valuable context for interpreting the results of this research.

#### *Role of AI in language learning and translation education*

The role of Artificial Intelligence (AI) in language learning and translation education has garnered significant attention within the academic literature, emerging as a transformative force in educational practices (Brenda, 2019; Wang, 2023). Schmidt and Strasser (2022) highlight AI's potential to address the limitations of traditional language teaching methods by offering adaptive, personalised, and real-world relevant learning experiences. AI applications in language-related contexts, such as machine-translation services and language learning apps with AI-driven personalised recommendations, leverage vast linguistic datasets to provide dynamic and effective educational experiences (Dai & Wu, 2023; Zou et al., 2023).

In the domain of translation education, innovative approaches integrating AI technologies have been introduced, extending beyond conventional methods (Hellmich & Vinall, 2021). These approaches incorporate AI-driven tools into the curriculum, including translation exercises augmented by AI feedback and virtual language labs with AI-assisted simulations (Zhao & Jiang, 2021). Studies evaluating these approaches reveal potential benefits alongside challenges that necessitate careful consideration (Jiang & Lu, 2021).

Existing AI-assisted language learning applications demonstrate promise in enhancing language proficiency by tailoring content and exercises to individual learners' needs and learning styles (Praktika.ai Company, 2023; Woo & Choi, 2021). The ability of AI to provide instant feedback and adaptive challenges contributes to a more immersive learning experience, leading to improved language outcomes and increased student engagement.

A noteworthy aspect of AI in language learning involves training AI models for translation tasks, where students actively contribute to the process (Popel et al., 2020). This bi-directional learning process empowers students with a deeper understanding of language nuances and influences the effectiveness of AI models in capturing human expression complexities (McKay et al., 2020).

While significant strides have been made in integrating AI into language learning and translation education, notable gaps exist in the current literature. There is a need for a comprehensive understanding of how AI impacts various aspects of translation education, including students' motivation, reflection, academic performance, and the overall quality of language translation within educational settings. These gaps highlight the importance of further research to explore the implications of AI-assisted methodologies comprehensively and to address any associated challenges.

Therefore, the purpose of this study is to examine the influence of AI-assisted app design and training on students' motivation, reflection, academic performance in translation courses, and the overall quality of language translation within the translation course. This research also aims to investigate both quantitative and qualitative aspects of this influence to provide valuable insights into the potential benefits and challenges of integrating AI technologies in translation education.

The research questions are outlined below:

1. How does the integration of AI-assisted app design and training impact students' motivation, reflective practices, academic performance, and the quality of written translation in the translation course?
2. What are students' perceptions regarding the integration of an AI-based and student-trained translation assistant into translation courses?

### **3. Methodology**

#### **3.1. Research design**

This study used a mixed-methods research approach employing a two-group (Experimental and Control Groups) post-test-only design. The investigation employed a quantitative approach to address the first research question and a qualitative approach to address the second research question. The integration of these approaches facilitated the contextualisation of findings, providing richer detail to the study's conclusions. The use of qualitative data allowed for the illustration of quantitative findings (George, 2022). The choice of this study design was grounded in the advantages of a two-group design, allowing for a direct comparison between the experimental group receiving AI-assisted training and the control group following traditional methods. The post-test-only design with two groups enhanced the ability to infer causality, reducing threats to internal validity compared to pre-test-post-test designs, thus minimising potential biases introduced by pre-test sensitisation and enabling a clearer examination of the immediate effects of the intervention. The visualised outline for the timeline of the study is presented in Figure 1.

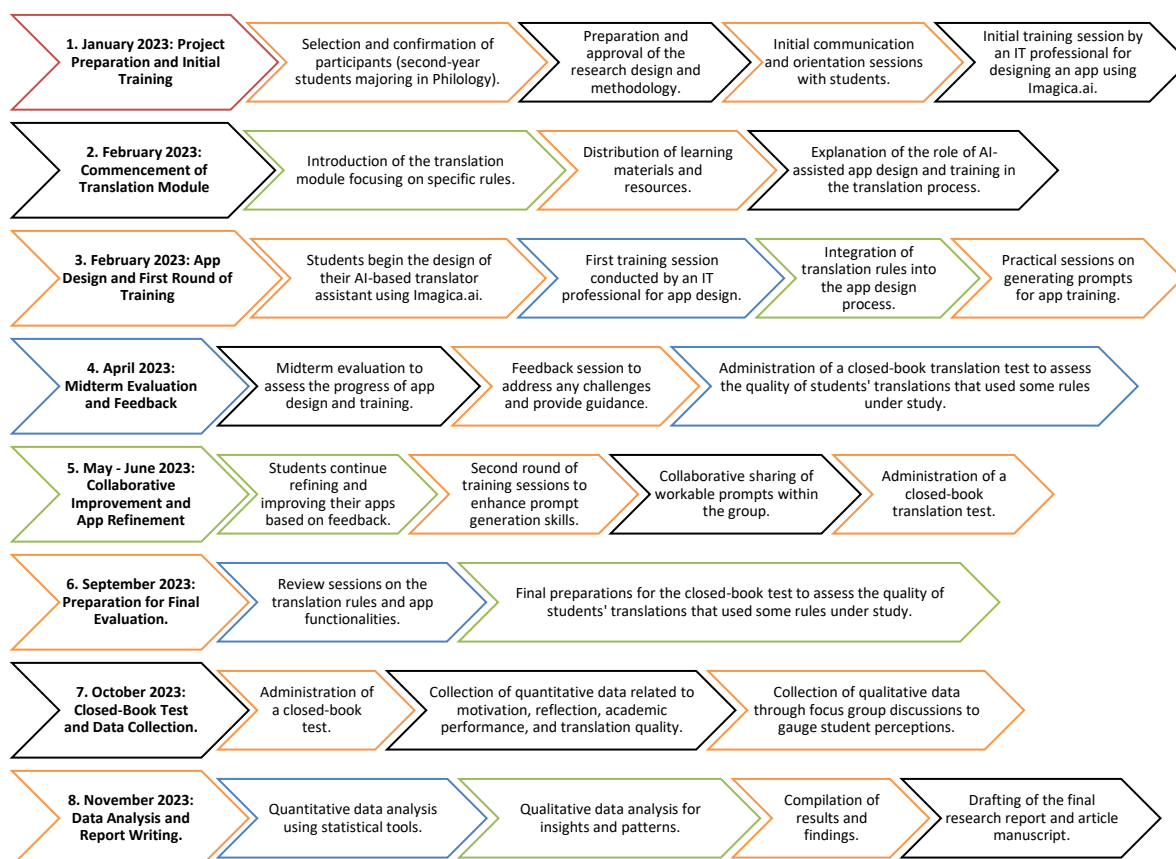


Figure 1. Visualised Outline for the Timeline of the Study

### 3.2. Research locale and respondents

A purposive sampling technique, commonly employed in mixed-methods research (van Haute, 2021), was utilised to select 35 second-year students majoring in Philology from Taras Shevchenko National University of Kyiv, Ukraine. The inclusion criteria for participants included being second-year students majoring in Philology at the university, having a proficiency level in the English language equivalent to B2 (CEFR), and having no prior exposure to AI-assisted translation tools or applications. Students who met these criteria were invited to participate in the study.

The sample comprised 17 students in the experimental group (EG), consisting of 9 males and 8 females aged 18-20, and 18 students in the control group (CG), including 8 males and 10 females aged 18-21. The groups exhibited homogeneity based on students' grade point averages (GPA), ranging from 2.3 (C ECTS) to 3.4 (B+ ECTS). To ensure the representativeness of the sample, additional measures were taken to control for extraneous variables, including eliciting information about students' prior experiences with AI tools, ensuring internet availability during the training sessions, and minimising external influences from friends and family outside the university.

The training sessions, designed to deviate from conventional methodologies, covered various aspects of AI-assisted translation tools and applications, such as understanding the functionalities of AI translation software, practising translation

tasks with AI assistance, and receiving feedback on translation quality. The training spanned two weeks, with sessions held twice a week for two hours each. During these sessions, students actively engaged in hands-on activities and discussions to enhance their understanding of AI-assisted translation.

Additionally, to clarify the criteria used to classify students into the experimental and control groups, as well as the process of selecting students for these groups, alongside GPA, factors such as language proficiency, prior exposure to AI tools, and willingness to participate in the study were considered. The purposive sampling technique was further employed to assemble three focus groups, each comprising three students representing one optimist, one pessimist, and one critic in each group. These measures aimed to provide a comprehensive understanding of the impact of AI-assisted app design and training on students' motivation, reflection, academic performance, and the quality of language translation within the translation course.

### **3.3. Research Instruments**

The research employed various data collection instruments to cover both intervention phases and post-intervention periods, in addition to conducting focus group discussions. Data regarding motivation and reflective practices were collected using two researcher-designed tools titled 'Quick Motivation and Reflection Scales' (QMRS) (see Appendix B and Appendix C). These questionnaires, based on Google Forms, were distributed via Telegram groups using an URL or QR code.

Both scales comprised 12 Likert agreement-scale statements. The tools underwent an expert validation process and demonstrated strong face and content validity. The QMRS for the experimental group (Appendix B) showed an Item-Level Content Validity Index (IL-CVI) of .916 and a Fleiss's Kappa coefficient of .533. The QMRS for the control group (Appendix C) showed an IL-CVI of .903 and a Fleiss's Kappa coefficient of .489. These results confirmed the questionnaires' reliability and suitability for statistical analysis.

Data to monitor other variables, such as academic performance in the translation course and the quality of students' written translations, were obtained through ongoing assessments of students as they completed assignments and three closed-book translation tests administered in both experimental and control groups at different phases of the intervention.

Qualitative data were gathered through three focus group discussions moderated using the guide in Appendix A. These discussions were conducted via the ZOOM video conferencing platform and recorded using the ZOOM session recording feature. Subsequently, Kapwing audio transcriber, an AI-powered transcription tool accessible at: <https://www.kapwing.com/tools/audio-to-text>, was employed to transcribe the recorded audios into texts. To ensure precision and clarity, the transcriptions were carefully reviewed.

### **3.4. Data Collection Process**

#### *a) Intervention phase*

The intervention was given to the experimental group of students enrolled in the 3 ECTS course in Industry-Specific Translation delivered at Taras Shevchenko National University of Kyiv. The focal point of the study was a module dedicated

to specific translation rules, including the “Translation of idiomatic/phraseological and stable expressions,” “Transformation of some idioms in the process of translating,” “Ways of translating participial constructions/complexes,” and “Ways of conveying the meanings of subjective modality.” These rules were intended to be practised within the context of specific language pairs, such as Ukrainian-English, Ukrainian-German, English-German, French-German, or/and English-French.

Students participated in two training sessions, conducted by an IT professional to design an app utilising the Imagica.ai web tool, accessible at <https://www.imagica.ai/>. This free, no-code AI app development platform was used because it offers a straightforward method to construct applications for various tasks. Subsequently, students received two training sessions from an IT professional to learn how to generate prompts instructing their app assistants in applying the translation rules emphasised in the module. To assess the quality of their app-generated translations, students shared functional prompts within the group, facilitating collaborative improvement and adaptation for diverse app training objectives.

To mitigate dependency on app assistance and ensure a comprehensive evaluation based on their understanding and application of the learned material, the lecturer conducted five closed-book tests. Each test covered the utilisation of specific translation rules, prohibiting students from referencing external materials, including their apps or notes.

The AI-assistant apps, developed and trained by EG students, utilised machine translation algorithms to generate initial translations of text passages provided by students, facilitating the creation of draft translations that could be refined and improved based on the app’s feedback. Moreover, students trained the apps to conduct contextual analysis to comprehend the meaning and context of text passages, enabling the apps to offer precise and contextually relevant suggestions for enhancing translations. Additionally, the apps conducted grammar and syntax checks on students’ translations, identifying and highlighting errors such as grammatical mistakes, punctuation errors, and syntactical inconsistencies. They provided suggestions for corrections and explanations for identified errors to aid students in comprehension and learning.

Furthermore, the AI-assistant apps enriched EG students’ vocabulary by drawing from an extensive database of vocabulary and language usage patterns. They proposed suggestions to enhance students’ vocabulary and word choice in their translations, offering synonyms, antonyms, and alternative phrases to facilitate more effective expression of ideas. Additionally, the apps featured interactive learning modules designed to train EG students in specific translation skills and concepts. These modules covered topics such as idiomatic expressions, cultural nuances, and language conventions, thereby assisting students in improving their translation proficiency over time.

#### *Integration into Translation Courses*

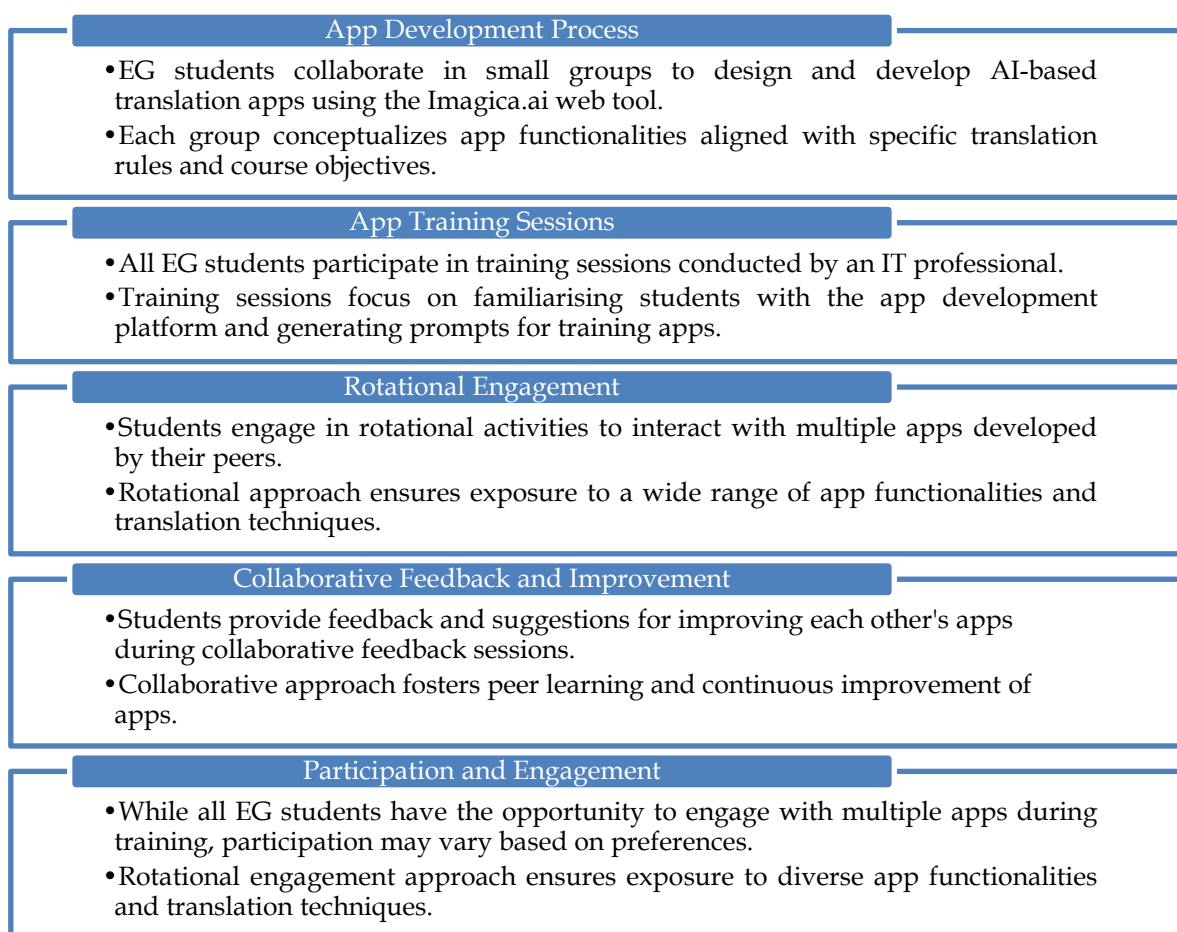
The integration of AI-based translation assistants, developed and trained by EG students, into the translation courses was seamlessly executed through structured training sessions and practical exercises. These sessions included an orientation to



familiarise EG students with the app's interface and basic functionalities, guiding them through app navigation, text input for translation, and feedback interpretation. Practical exercises involved EG students translating sample passages using the app and receiving real-time feedback, facilitating a controlled environment for app usage practice and confidence enhancement. Advanced training modules, progressively introduced throughout the course, addressed complex translation scenarios and provided in-depth training on advanced app features such as contextual analysis, grammar checking, and vocabulary enhancement.

#### *Development and Utilisation of AI-based Translation Apps*

The development and utilisation of AI-based translation apps in this study were facilitated through a structured approach aimed at engaging all participating students effectively. Figure 2 presents key components of app design and use.



#### *b) Post-Test Administration*

The research procedure entailed actively involving experimental groups in the design of the AI-based translator assistant and its subsequent training during the translation course. Conversely, the control group received training through conventional translation education methods. In this study, the independent variable was the integration of AI-assisted app design and student training, while students' motivation, reflective practices, academic performance in the translation course, and the quality of written translation were considered dependent

variables. To assess differences between the groups, the Independent Samples *t*-test was employed.

The Independent Samples *t*-test was selected owing to its capability to compare outcomes (post-test measures) between the two independent groups—the experimental group receiving treatment via AI-assisted app design and training and the control group without this intervention (Ross & Willson, 2017). This test was deemed appropriate, given the assumption that the dependent variables (motivation, reflective practices, academic performance in the translation course, and quality of students' written translations) were continuous, making the Independent Samples *t*-test suitable for analysing mean differences. The assumption of homogeneity of variances, indicating roughly equal variance within each group, was verified before conducting the test. Moreover, the relatively small sample size favoured the use of this *t*-test.

#### *c) Conducting the Focus Group Discussions (FGDs)*

To evaluate students' perceptions regarding the integration of an AI-based and student-trained translation assistant into the translation course, a focus group discussion was conducted with three purposefully selected experimental group (EG) student cohorts. The FGD was organised following a structured approach outlined in the Focus Group Discussion Guide (refer to Appendix A). This guide provided a framework for the moderator to facilitate discussions and ensure that key topics related to the research objectives were addressed. The FGD sessions were conducted online using the ZOOM video conferencing platform to accommodate the participants' schedules and ensure their safety and convenience. Each session was scheduled for approximately 60-90 minutes to allow for in-depth discussions while also respecting participants' time. Before the FGDs commenced, participants were briefed on the objectives of the discussion and assured of confidentiality regarding their responses. The moderator facilitated the discussion by posing open-ended questions and encouraging participants to express their thoughts freely. During the FGDs, audio recordings were made to capture all discussions accurately. These recordings served as a valuable resource for later transcription and analysis. To ensure accuracy in capturing participants' responses, the moderator actively listened and paraphrased key points to confirm understanding. Following the completion of each FGD, the audio recordings were transcribed into text format using an AI-powered transcription tool. The transcriptions were then carefully reviewed and edited to ensure clarity and accuracy before proceeding with data analysis.

### **3.5. Data Analysis**

The outcomes of the two independent groups, encompassing motivation, reflective practices, academic performance in the translation course, and the quality of students' written translations, were subjected to analysis and comparison using the Independent Samples *t*-test. Categorical data, specifically the outcomes from the Quick Motivation and Reflection Scales for the EG and CG, such as Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree, transformed numerical values for processing through *jamovi* statistical software (Version 2.2.5). Similarly, students' grades in academic performance in the translation course and the quality of written translations, already in numerical form, were processed using *jamovi* statistical software (Version 2.2.5).

Qualitative research data drawn from focus groups were analysed using the Speak web-based thematic analysis tool, powered by artificial intelligence and specifically tailored for the examination of unstructured language data (Speak AI Inc, 2023). The selection of this tool was deliberate, given its explicit design for the analysis of data derived from interviews and focus groups. It operates by transcribing audio files and subsequently conducting an automatic, comprehensive analysis with features such as extraction, visualisation, and prompting functions. A thematic analysis involved the identification of emerging common themes and patterns within the discussion data. Pertinent areas were systematically coded for further study. The perspectives and experiences of individuals were subsequently compared to uncover commonalities, inconsistencies, and contradictions within the qualitative findings.

#### *Ethics Statements*

Before focus group discussions, students were briefed on the study's purpose and objectives. Ethical approval was obtained from the Ethics Committee for the Board of Academics at Taras Shevchenko National University of Kyiv. Participants were assured of voluntary participation and confidentiality. Details on data use and handling were provided, emphasising research purposes. Potential risks and benefits were discussed. Contact information of the moderator was shared for queries. Each participant confirmed voluntary participation and understanding of study terms.

## **4. Results**

This section unveils the impact of AI-assisted app design and training on students' motivation, reflective practices, academic performance, and quality of written translation in the translation course. The results below are derived from the quick motivation and reflection scales for both the experimental group (EG) and control group (CG), as well as from the analysis of intervention participants' academic performance in the translation course and the quality of their written translations using the Independent Samples *t*-test. Students' perceptions regarding the integration of an AI-based and student-trained translation assistant into translation courses are presented through the thematic analysis of data drawn from the focus groups.

#### *Impact of AI-Assisted Training on the Variables Under Study*

The results obtained from the Independent Samples *t*-test and the assessment of normality distributions across all variables consistently affirmed the effectiveness of the intervention in the experimental group (EG). This led to notably elevated levels of motivation, reflective practices, academic performance, and the quality of written translation when compared to the control group (CG). The considerable effect sizes underscore the substantive significance of the observed discrepancies, implying that the intervention yielded meaningful and substantial effects on the assessed outcomes. Despite acknowledging concerns regarding normality, the robust statistical significance and substantial effect sizes across all variables suggest that the observed differences possess practical significance and are not solely attributable to deviations from normality. These findings underscore the potential of AI-assisted training methodologies to positively influence students' learning experiences and performance within translation courses.

**Table 1. Results Drawn from the Independent Samples T-Test**

		Statistic	df	p	Mean difference	SE difference	95% Confidence Interval		Effect Size	
							Lower	Upper		
Motivation	Student's t	5.85	33.0	<.001	0.587	0.1003	0.383	0.791	Cohen's d	1.98
Reflection	Student's t	18.38	33.0	<.001	1.589	0.0864	1.413	1.765	Cohen's d	6.22
Academic performance	Student's t	10.98	33.0	<.001	17.141	1.5604	13.966	20.315	Cohen's d	3.71
Quality of written translation	Student's t	11.57	33.0	<.001	16.846	1.4556	13.885	19.808	Cohen's d	3.91

As shown in Table 1, the extremely low p-values (< 0.001) in the Independent Samples T-Test results indicate statistically significant differences between the two groups for all variables. The relatively large effect sizes (Cohen's *d*) suggest that the observed differences are not only statistically significant but also practically significant.

For Motivation, the *t*-test indicates a highly significant difference between the EG and CG, with a substantial effect size (Cohen's *d* = 1.98). The positive mean difference of 0.587 suggests that participants in the EG had significantly higher motivation levels than the CG. The 95% confidence interval (CI) further supports this, ranging from 0.383 to 0.791. The potential departure from normality ( $W = 0.963, p = 0.0273$ ) does not undermine the strength of the significant results.

The *t*-test for Reflection reveals an extremely significant difference between the EG and CG, with an exceptionally large effect size (Cohen's *d* = 6.22). The positive mean difference of 1.589 indicates that participants in the EG demonstrated substantially higher reflective practices than those in the CG. The 95% CI (1.413 to 1.765) reinforces the robustness of this finding. Despite the potential departure from normality ( $W = 0.983, p = 0.0086$ ), the extremely significant results and the substantial effect size emphasised the practical importance of the observed differences in reflective practices, indicating a strong impact of the intervention.

The *t*-test for Academic Performance uncovers a highly significant difference between the EG and CG, with a notable effect size (Cohen's *d* = 3.71). The positive mean difference of 17.141 suggests that participants in the EG exhibited significantly better academic performance in the translation course compared to the CG. The 95% CI (13.966 to 20.315) reinforces the substantial impact of the intervention. The potential departure from normality ( $W = 0.968, p = 0.0391$ ) does not diminish the strength of the highly significant results.

The *t*-test for the quality of written translation demonstrates a highly significant difference between the EG and CG, with a considerable effect size (Cohen's *d* = 3.91). The positive mean difference of 16.846 indicates that participants in the EG produced significantly higher-quality written translations than those in the CG. The 95% CI (13.885 to 19.808) reinforces the substantial impact of the intervention. Despite the potential departure from normality ( $W = 0.960, p = 0.0225$ ), the highly significant results and the substantial effect size highlight the practical

importance of the observed differences in the quality of written translation, indicating a significant impact of the intervention.

#### *A Thematic Analysis of Data Drawn from the Focus Groups*

The results of the thematic analysis of students' responses in bulk conducted through the Speak web-based tool revealed a sentiment value of 0.224. When interpreting this score on the conventional scale of -1 to 1, the outcome falls within the positive range, indicating a favourable perception of the intervention and its outcomes.

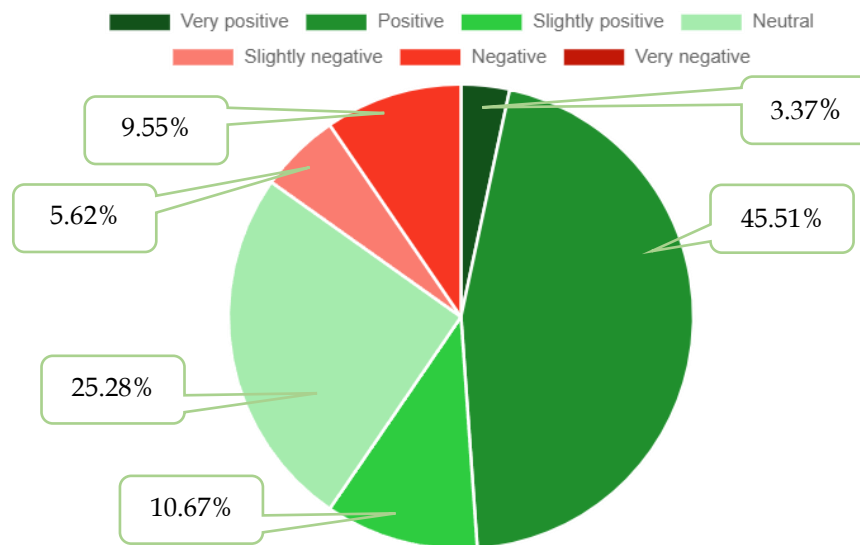


Figure 3. Distribution of Sentiment Categories Obtained from Thematic Analysis of Students' Responses in Bulk

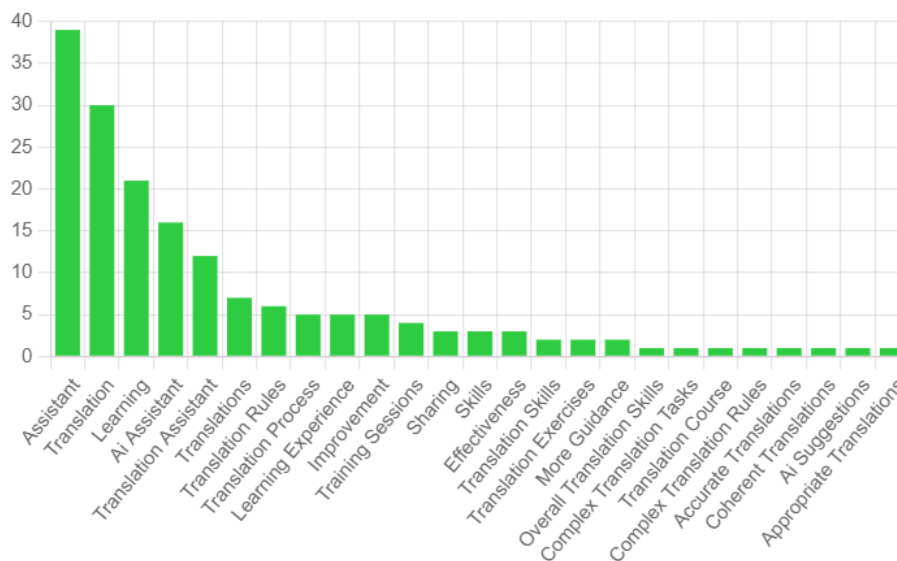
As can be seen in Figure 3, the analysis identified the prevalence of Positive and Very Positive sentiment categories, constituting 45.51% and 3.37% respectively. These findings suggest an overall optimistic outlook among participants, implying a positive reception of the AI-assisted training approach. Additionally, the Neutral category, representing 25.28% of responses, signifies a significant portion of participants who maintained a balanced perspective, refraining from expressing explicit positive or negative sentiments. This neutrality could arise from diverse individual experiences or a pragmatic evaluation of the intervention's impact. Conversely, the combined responses of Slightly Negative (5.62%) and Negative (9.55%) categories amount to 15.17%, reflecting a less favorable sentiment. The presence of negative sentiments highlights the need to acknowledge diverse viewpoints and potential areas of discontent or concern among participants. In summary, the thematic analysis indicates an overall positive sentiment, with a noteworthy portion of participants expressing a neutral viewpoint and a smaller proportion expressing negative sentiments. This nuanced understanding contributes to a comprehensive evaluation of participant perspectives on the AI-assisted training intervention. Some of the most illustrative students' quotes were as follows:

*Positive Perspective: "Oh, the AI-based translation assistant? It was a game-changer, seriously. Made the whole learning thing way more exciting and dynamic."*

*Neutral Perspective: "So, the AI tool was pretty user-friendly overall, but I did hit a few bumps. Those advanced features? A bit tricky to navigate, I won't lie."*

*Critical Perspective: "Eh, it was a bit hit or miss for me. Sometimes it did the trick, other times, not so much. Kind of kept me on my toes."*

The keyword analysis offers valuable insights into the prevalent themes and focal points discerned from participants' comments concerning the AI-assisted translation intervention. The identification of ten specific themes was facilitated by examining the frequencies of keywords. These themes encompassed learning and improvement, effectiveness, the translation process, AI assistant, guidance and refinement, complexity, usual learning routine, overall comprehension and coherence, transformative experience, and appropriateness.



*Figure 4. Results of the Keyword Analysis Obtained from the Participants' Comments Related to the AI-assisted Translation Intervention*

As illustrated in Figure 4, the recurrent appearance of terms such as "Learning," "Improvement," and "Training sessions" suggests participants perceived the AI-assisted translation tool as a contributory factor to their learning experiences and skill enhancement. The repetition of the term "Effectiveness" three times implies that participants likely engaged in discussions about the efficacy of the AI tool in facilitating their translation tasks. The frequent mentions of "Translation," "Translation process," and "Translations" indicate that participants shared reflections on the tool's impact on their translation activities. Moreover, the prominence of terms like "AI assistant" and variations such as "Assistant" underscores the central role of the AI assistant in participants' comments. Expressions like "More guidance" and "Refining prompts" suggest that participants may have provided feedback on the level of guidance and prompts offered by the AI tool. Terms like "Complex translation rules" and "Complex translation tasks" indicate participants' perceptions of the tool's ability to handle intricate translation challenges. The inclusion of "Usual learning routine" implies a comparison between the AI-assisted approach and participants' regular learning methods. Additionally, the terms "Overall comprehension," "Coherent translations," and "Conveying meanings" reflect discussions on how well the AI

tool supported participants in understanding and conveying intended meanings in translations. The mention of "Transformative experience" suggests that participants found the AI-assisted translation to be a significant and impactful aspect of their learning. Lastly, the occurrences of terms such as "Accurate translations" and "Appropriate translations" provide insights into participants' perceptions regarding the accuracy and appropriateness of the AI-generated translations. The above thematic categories offer a broad range of insights into the diverse perspectives and experiences of participants with the AI-supported translation intervention.

Overall, the thematic analysis of students' responses offers valuable insights into addressing both research questions. Concerning the first research question, the identified themes such as "Learning and Improvement," "Effectiveness," and "Transformative Experience" emphasise the pivotal role of AI-assisted training in bolstering students' motivation, reflective practices, and academic performance. These findings suggest that the integration of AI technologies not only enhances traditional learning methods but also catalyses transformative learning experiences. Furthermore, themes like "Complexity" and "Usual Learning Routine" prompt critical reflections on the disruptive potential of AI in challenging conventional pedagogical approaches, and fostering innovation in translation education.

Regarding the second research question, themes such as "AI Assistant" and "Guidance and Refinement" provide nuanced insights into students' perceptions of AI-based translation assistants. While participants acknowledged the AI assistant's central role and its potential to provide valuable guidance, their feedback also highlighted areas of improvement, particularly in terms of refining prompts and enhancing the tool's adaptability to diverse translation contexts. Additionally, the theme of "Overall Comprehension and Coherence" underscores the importance of AI technologies in supporting students' comprehension and expression of complex linguistic nuances, thereby enriching the quality of translation outputs. However, expressions like "Appropriate Translations" suggest a critical evaluation of the AI-generated translations, hinting at concerns regarding accuracy and contextual appropriateness.

## 5. Discussion

The integration of an AI-based translation assistant into a university-level translation course demonstrated transformative effects on students' learning experiences and outcomes, aligning with the research objectives. The study explored the impact of AI-assisted app design and training on students' motivation, reflective practices, academic performance, and the quality of written translation within the translation course. Key findings revealed significant improvements in motivation, reflective practices, academic performance, and translation quality among students in the experimental group (EG) compared to the control group (CG). Robust statistical significance and substantial effect sizes underscored the transformative impact of AI-assisted training. Thematic analysis using the Speak web-based tool revealed an overall positive sentiment (0.224), emphasising Positive and Very Positive sentiments. The Neutral category suggested a balanced perspective, while the combined Slightly Negative and

Negative categories represented less favourable sentiment. These results echo previous studies emphasising the positive influence of AI on language learning, as evidenced by the systematic review by Zhai and Wibowo (2023) on AI dialogue systems for English as a Foreign Language (EFL) students and the findings of Chen et al. (2022) on the alignment between educators' expectations and AI offerings in language education.

The observed improvements in motivation, reflective practices, academic performance, and translation quality underscore the effectiveness of AI-assisted training in enhancing students' learning experiences. The findings suggest that the AI-based translation assistant facilitated students' engagement with translation tasks, leading to increased motivation and reflective thinking. Moreover, the significant improvements in academic performance and translation quality indicate the practical benefits of integrating AI technologies into translation education. These interpretations align with previous research highlighting the positive impacts of AI on language proficiency and interactive learning environments, as demonstrated by studies conducted by Rebolledo Font de la Vall and González Araya (2023) and Rusmiyanto et al. (2023).

The findings of this study have significant implications for language education, particularly in the context of translation courses. By demonstrating the effectiveness of AI-assisted training in enhancing student's learning experiences and performance, the study highlights the potential of AI technologies to revolutionise language learning environments. The insights gained from this research contribute to the body of knowledge by providing a nuanced understanding of the multifaceted impacts of AI on language education. These implications emphasise the importance of continued exploration and adaptation of AI tools to maximise their benefits in language learning contexts. Building upon the work of Mitra and Banerjee (2023) and Rismanchian and Doroudi (2023), our research contributes insights into the dynamic intersection of AI and language education. However, future investigations could delve deeper into specific linguistic distinctions and contextual challenges, enriching our understanding of AI tools in language learning environments.

Despite the valuable insights provided by this study, certain limitations must be acknowledged. The relatively small sample size and the specific context of the study may limit the generalisability of the findings to broader student populations or diverse educational settings. Additionally, the subjective nature of the responses obtained through focus group discussions and self-reported data may introduce biases that could impact the accuracy of the results. Furthermore, the study focused primarily on the immediate impact of AI-assisted training, leaving the long-term effects and sustainability of these benefits unexplored.

To address these limitations and further advance the understanding of AI in language education, future research could explore the long-term impact of AI integration on language proficiency and students' adaptation to technological interventions over extended periods. Additionally, studies could delve deeper into specific linguistic nuances and contextual challenges to enrich our understanding of AI tools in language learning environments. Despite these limitations, the findings of this research contribute valuable insights into the evolving landscape of AI in language education and highlight the need for



continued exploration and adaptation to maximise the benefits of these technological interventions.

## **6. Conclusion**

This study addressed the transformative impact of integrating an AI-based translation assistant into a university-level translation course, with a focus on motivation, reflective practices, academic performance, and translation quality. Through our research, we contributed insights to the discourse on AI in language education, uncovering previously unexplored dimensions. Our key findings, which include innovative student-designed apps, outcomes of the Independent Samples *t*-test, and thematic and keyword analyses, collectively underscored the positive outcomes of the intervention. Thematic analysis revealed an overall positive sentiment, with ten identified themes providing a nuanced understanding of participant perspectives. Our findings align with existing literature, emphasising AI's positive influence on English language skills for EFL students. While cautioning against overly broad generalisations due to the subjective nature of responses, our study underscores the significance of incorporating AI tools in language education. The positive transformations observed in handling language elements further underscore the effectiveness of the AI tool. The study suggests avenues for future research into linguistic nuances and contextual challenges, urging ongoing exploration to maximise the benefits of these technological interventions.

### *Recommendations*

Drawing from the insights gained in this study, several recommendations can guide future researchers and practitioners interested in the integration of AI-based tools in educational settings. Firstly, researchers should aim for more extensive and diverse participant samples to enhance the generalisability of findings across various educational contexts. Exploring the long-term effects of AI-assisted interventions on learning outcomes could contribute to a more comprehensive understanding of their sustained impact. Additionally, future studies could adopt a mixed-methods approach to triangulate quantitative and qualitative data, providing a more nuanced perspective on the intervention's effectiveness. Practitioners should consider providing more detailed tutorials and support for students navigating advanced features, ensuring a smoother integration into their learning routines. Furthermore, ongoing training sessions and refresher courses can help students maximise the benefits of AI tools over time. Ethical considerations should remain a priority and transparency in explaining data usage and ensuring participant privacy should be upheld. Overall, a continuous dialogue between researchers, practitioners, and students is essential to iteratively refine AI-assisted approaches, fostering an environment that aligns with the evolving needs and expectations of learners.

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## Appendices

### Appendix A. Focus Group Discussion Guide

#### Introduction:

1. Please share your overall perception of how the integration of the AI-based and student-trained translation assistant influenced your learning experience in the translation course.
2. How would you describe your experience in using the AI-based translation assistant during translation exercises? Was it easy or challenging?

3. Share your thoughts on the training sessions for developing prompts and using the AI assistant. How did these sessions contribute to your understanding of translation rules?

*Impact on Learning Outcomes:*

4. In what ways do you believe using the AI-based translation assistant improved your ability to translate idiomatic and phraseological expressions?

4a. Did you find the AI-based translation assistant helpful in transforming idioms during the translation process? Please provide examples from your experience.

4b. Share your insights into the effectiveness of the AI assistant in translating participial constructions/complexes.

4c. How do you think the AI-based translation assistant contributed to a better understanding of conveying meanings of subjective modality?

*Collaboration and Peer Learning:*

5. Discuss how sharing prompts within the group facilitated collaborative learning and improvement of the app-generated translations.

5a. How did peer interaction in designing the app and developing prompts enhance your learning experience? Share specific instances or examples.

*Perceived Challenges:*

6. Reflect on any challenges you faced in understanding how to use the AI-based translation assistant. What aspects were particularly challenging for you?

6a. Discuss your experience in developing prompts for the AI assistant. Was this task challenging, and why?

*Overall Satisfaction:*

7. Share your overall satisfaction with the integration of the AI-based translation assistant into the translation course. What aspects contributed to your satisfaction or dissatisfaction?

7a. Would you recommend the use of an AI-based translation assistant to future students in translation courses? Why or why not?

*Closing:*

8. Is there anything else you would like to add regarding your experience with the AI-based translation assistant in the translation course?

8a. Do you have any suggestions for improvements or additional features that could enhance the effectiveness of the AI-based translation assistant in future courses?

### ***Appendix B. Quick Motivation and Reflection Scales for the EG***

*(can be accessed via the link: <https://forms.gle/mTeh4wVUmtqsU6ek6>)*

*Agree or disagree (Strongly Disagree; Disagree; Neutral; Agree; Strongly Agree) with the following statements based on your experience with the AI-assisted app design and training.*

Motivation Scale:

1. The use of the AI-assisted app in translation exercises increased my motivation to engage with course materials.
2. The AI-assisted app features positively influenced my motivation to learn and apply translation rules.
3. I found the AI-assisted app engaging, which enhanced my enthusiasm for translation tasks.
4. The AI-assisted app increased my interest in exploring different language pairs for translation.
5. I felt a sense of accomplishment when using the AI-assisted app for translation exercises.
6. The AI-assisted app made the translation course more enjoyable for me.

Reflection Scale:

7. The process of designing prompts for the AI-assisted app encouraged me to reflect on translation rules.
8. Collaborating with peers to improve app-generated translations facilitated my reflection on translation strategies.
8. The training sessions on app development promoted a reflective approach to translation tasks.
10. Discussing app-generated translations with peers deepened my understanding of translation nuances.
11. The app development process encouraged me to think critically about the application of translation rules.
12. Using the AI-assisted app prompted me to reflect on alternative approaches to translation.

*Note: 1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; and 5 = Strongly Agree.*

### ***Appendix C. Quick Motivation and Reflection Scales for the CG***

*(can be accessed via the link: <https://forms.gle/cDmvess5S2sw9eyj7>)*

*Agree or disagree (Strongly Disagree; Disagree; Neutral; Agree; Strongly Agree) with the following statements based on your experience of training you received in the translation course.*

#### **Motivation Scale:**

1. The training techniques employed in this translation course effectively motivated me to actively participate in the learning process.
2. I perceived a clear sense of purpose and relevance in the traditional translation exercises, fostering my motivation.
3. The instructional methods utilised in this translation course inspired persistence in tackling and overcoming translation challenges.
4. In general, the training methods employed in the course significantly enhanced my motivation to delve into the intricacies of translation.
5. The course content consistently stimulated my interest and enthusiasm for improving translation skills.
6. I found the translation assignments engaging, contributing positively to my overall motivation and commitment.

#### **Reflection Scale:**

1. The instructional approach in this translation course facilitated deep reflection on the subtleties of language and translation.
2. Actively contemplating and analysing various translation strategies during this course enriched my understanding of the translation process.
3. The training sessions provided opportunities for valuable self-reflection on the quality and nuances of my translations.
4. Reflecting on the pen-paper-dictionary exercises offered in the course played a significant role in refining and enhancing my translation skills.
5. The course structure encouraged continuous introspection, leading to a more profound understanding of translation complexities.
6. Engaging in reflective practices throughout the course positively impacted the refinement of my translation techniques.

*Note: 1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; and 5 = Strongly Agree.*