

# Aligning Translation Curricula with Technological Advancements; Insights from Artificial Intelligence Researchers and Language Educators

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## Abstract

This study expounded on methods, approaches, and strategies for aligning translation curricula with technological enhancements in the effort to train translators who are good to function in the AI-driven translation industry. The study sample consisted of 83 university lecturers in translation studies and 151 artificial intelligence experts from ten Jordanian universities. The study was carried out during the academic year 2022-2023. Moreover, the study design is a survey approach, and the strategy of the research is quantitative. Data was collected using a questionnaire and analysis was conducted using relevant descriptive statistics tools, including the percentile values of the Likert scale, the mean, and the standard deviation. In addition, the findings generally indicate that task-based approach, team-based strategy, blended learning, and reflective system are the main pedagogical strategies and teaching techniques that work optimally for incorporating AI-based translation technologies into translation curricula. Similarly, the findings generated from the data analysis further suggest that the main strategies to ensure alignment of translation curriculum with technological advancements are careful designing of specific lessons for technology in translation, formation of partnerships between industry players (translation industry leaders and AI experts), and translation curriculum designers, continuous review of the curriculum, and inclusion of creativity and critical thinking for the students. Finally, it is concluded that translation curriculum designers must always review the translation curriculum, partner with translation industry leaders and AI experts, and integrate critical thinking and creativity into the translation curriculum system. This is to ensure that the trained translators can function effectively in the AI-driven translation industry.

**Keywords:** translation, artificial intelligence, translation curricula, methods

## 1. Introduction

Communication and understanding between people with different language origins are greatly aided through translation. It is becoming increasingly essential to consider how translation curricula might be in line with the tremendous technological developments occurring currently, especially in the area of artificial intelligence (AI). According to Zhu (2020), people who speak various languages may comprehend and communicate with one another more successfully when translation acts as a bridge between them. It acts as a crucial facilitator for cross-border intellectual partnership, economic integration, and cultural interchange. The need for professional translation services has considerably increased as the globe becomes more interconnected.

Particularly in the areas of machine translation and natural language processing, artificial intelligence has advanced significantly in recent years. The accuracy and efficiency of translation have significantly improved due to AI-powered technologies like neural machine translation (NMT) systems. These developments have changed the field of translation and made it possible for procedures to be quicker and more effective. For instance, Google's 2016-launched neural machine translation system has made significant strides in translating texts that seem more natural and are correct in their context (Doherty, 2021).

It is essential to integrate the translation curriculum with the most recent technology developments to train prospective translators for the changing needs of the profession. Teachers may provide students with the knowledge and skills they need to use AI-based translation systems successfully by incorporating them into the curriculum. In a translation industry that is increasingly driven by technology, this alignment will guarantee that graduates are well-equipped to fulfill rising

client and employer demands. Additionally, using artificial intelligence in translation courses may promote interdisciplinary learning and promote cooperation between computer science and translation departments.

The goal of this study is to examine the perspectives of artificial intelligence researchers and language teachers to identify viable paths for integrating translation curricula with cutting-edge technology tools and methods. This study aims to pinpoint the essential factors and suggestions for creating courses that successfully include AI-based translation tools by using the knowledge and experience of these experts.

To create and improve translation technology, artificial intelligence researchers are essential. Understanding the potential and boundaries of AI-based translation systems needs their knowledge and experience, which is invaluable. Discussing existing technologies' efficacy, prospective future advancements, and AI's influence on the translation business with AI researchers could offer useful information. Education professionals may make sure that students get up-to-date instruction that is compatible with technological improvements in the industry by putting their viewpoints into the creation of a translation curriculum.

The process of training the next generation of translators is being led by language educators. Their contacts with students and experiences in the classroom provide important insights into the actual application of translation courses. To successfully incorporate AI-based translation systems into the curriculum, language educators may provide viewpoints on the pedagogical approaches, learning objectives, and evaluation techniques. Their knowledge and input are crucial for creating a curriculum that balances the use of conventional translating abilities with AI technology.

### *1.1 Problem Statement*

Previous studies on integrating translation curricula with technology innovation have shed light on several curriculum designs, teaching strategies, and the use of AI-based translation technologies. The main conclusions of this research highlight the potential advantages and difficulties of using technology in translation instruction. There is a vacuum in the literature, nevertheless, regarding the opinions of AI specialists and language teachers on how to match translation curricula with technology improvements (khasawneh, 2022c).

Previous investigations have mostly concentrated on conceptual frameworks, instructional strategies, and design principles for curricula (Huet et al., 2019). Although these studies provide insightful information, they often lack the opinions and involvement of AI specialists and language teachers, who are vital to the creation and execution of translation curricula. Understanding the present status of AI technologies, their capabilities, and future developments in the translation industry requires the viewpoints of AI professionals. On the other hand, language teachers have important knowledge of the pedagogical issues, instructional strategies, and practical difficulties that arise when incorporating AI technology into a translation curriculum.

As a result of the fact that the topic is still developing, there is a gap in the literature about the opinions of AI specialists and language instructors regarding the integration of translation curricula with technological progress. Since the incorporation of AI technology into translation curricula is a new phenomenon, there aren't many empirical studies that look at various stakeholders' viewpoints. To keep the translation curriculum current and in line with technological improvements, AI specialists and language educators must provide up-to-date views due to the dynamic nature of AI technology and the translation business. By addressing this gap in the literature and considering the viewpoints of AI specialists and language educators, it will be possible to get a deeper knowledge of the practical issues, difficulties, and suggestions for integrating technology improvements into translation programs. Curriculum developers, educators, and policymakers may construct translation curricula that successfully educate students for the needs of the AI-driven translation environment by taking into account their ideas.

### *1.2 Research Questions*

Considering the established aims of the study and the gaps in the literature already explored, the following study questions are posed, to guide both the data collection and analysis:

- i. What pedagogical strategies and teaching techniques work optimally for incorporating AI-based translation technologies into translation curricula?
- ii. How can a translation curriculum be created to be in line with technological advancements?
- iii. How can translation curricula be modified to foster the core competencies and skills needed by translators in the AI-driven translation landscape?

## **2. Literature Review**

### *2.1 Exploring Studies on Translation Curriculum and Curriculum Development in Translation Education*

To equip future translators with the required abilities and information, translation education must include a translation

curriculum and curriculum development. Studies on the creation of translation curricula stress the need to formulate precise learning goals that are in line with the intended program results. Researchers have looked at how to identify and formulate learning goals in translation curricula, including Cabezudo et al. (2017) and Doherty (2016). These goals often involve the advancement of technology competence, intercultural competence, domain-specific knowledge, and skills. The analysis of this research may clarify how important learning goals are in designing a translation curriculum.

The information chosen and the order in which it is presented in translation curricula have a big influence on how well students learn to translate. Research on the issue of content selection has been conducted by Kiraly (2012) and Jääskeläinen and Koskinen (2019), covering important subjects including translation theory, specialized translation, computer-assisted translation technologies, and ethical conduct. A cogent and continuous learning experience for students is ensured by these research insights on the organizing and sequencing of material.

To engage students and improve their learning experiences, effective teaching strategies, and methodologies are essential in translating educational programs. Numerous pedagogical strategies, such as conventional classroom teaching, experiential learning, collaborative learning, and project-based learning, are investigated in studies by authors like Risku (2018) and Alves et al. (2017). These studies examine how various teaching strategies affect students' technical aptitude, critical thinking skills, and translation ability.

A systematic foundation for creating a translation curriculum that meets industry expectations is provided by competency-based models. The use of competency-based frameworks in translation education is investigated in studies by PACTE (2003) and Göpferich (2008). These studies concentrate on identifying and characterizing the fundamental skills necessary for effective translation practice, including technical, strategic, and translation skills. The evaluation of these studies can assist with the competency-based methods' inclusion into translation programs.

Approaches that focus on the completion of actual translation projects emphasize the practical use of translation abilities. The advantages and difficulties of using task-based techniques in translation curricula are examined in studies by writers including González Davies (2004) and Göpferich et al. (2013). These studies look at how students' translation proficiency and their capacity to deal with real-world translation circumstances are affected by task design, task kinds, and feedback systems.

A key component of the translation curriculum is assessment, which is used to assess students' growth and accomplishments. Different evaluation methodologies, including self-assessment, peer assessment, reflective portfolios, and translation quality assessment, are explored in research by authors including Kuznik and Schäffner (2017) and Huertas-Barros (2018). These studies look at how well these methods work in evaluating students' skills to translate, think critically, and reflect.

## *2.2 Theoretical Reflection on Translation Curricula*

Basic theories and paradigms in translation studies are included in the planning and creation of translation curricula at educational institutions. The theoretical underpinnings of the creation and development of a translation curriculum are presented in this section. The competency-based approach, functionalist theories, and process-oriented models are just a few of the theories and models in translation studies that teachers may explore to learn more about the knowledge, skills, and abilities needed by translators. These theoretical models provide a foundation for matching translation curricula with advancements in technology.

### **i. Functionalist Theories**

This theoretical foundation has implications for curriculum development since it emphasizes the need for training students to consider the target audience, the communication context, and the desired goal of translations. The inclusion of functionalist viewpoints in the translation curriculum helps students get a sophisticated grasp of the function of translation in diverse communication contexts (Khasawneh, 2022b).

### **ii. Process-Oriented Models**

Process-oriented models, like the Translation Process Research (TPR) framework (Alves and Gonçalves, 2007), put a special emphasis on the mental processes involved in translation. TPR investigates the thought processes, approaches to addressing problems, and choices made while interpreting texts. Teachers may encourage students' metacognitive awareness and teach them efficient problem-solving strategies by introducing process-oriented models into translation educational programs. Students can adapt to various translation assignments, create successful translation techniques, and make appropriate use of technology with the aid of this theoretical framework.

### **iii. Sociocultural Theories**

According to sociocultural theories, such as the sociocultural approach to translation (Lörscher, 2012), the social and cultural aspects of translation are highlighted. This strategy acknowledges that translation is a socially constructed practice

impacted by sociolinguistic, power, and cultural norms. Sociocultural theories are included in the translation curriculum to help students think about the socio-cultural context of translations, including ethical issues, audience expectations, and cultural allusions. Students may improve their intercultural sensitivity and skill in their translation practice by using this theoretical viewpoint.

#### iv. Cognitive Linguistic Theories

According to the Cognitive Translation Studies (CTS) framework (Göpferich, 2009), cognitive linguistic theories look at the cognitive mechanisms that underlie translation. CTS investigates how translators use linguistic resources, convey meaning, and make judgments during translating. The use of cognitive linguistic theories in translation curriculum aids students in grasping cognitive elements like metaphor, conceptual blending, and cognitive load more thoroughly. The capacity to examine and work with language structures in translation is improved for students because of this theoretical viewpoint.

#### v. Technology-Enhanced theories

With the development of technological devices, ideas on technology-enhanced translation have become more prevalent. These ideas investigate how technology, including CAT tools, localization software, and machine translation, is incorporated into the translation process. The influence of technology on translation abilities and the shifting role of translators in the digital era are addressed by theoretical frameworks like the one presented by O'Hagan and Mangiron (2013), which is based on the concept of technical competence. The inclusion of technology-enhanced theories in the translation curriculum helps students get the requisite technical proficiency and make adjustments to the changing translation environment.

The main theoretical frameworks that guide the creation and development of translation curricula have been covered in this section. The competency-based approach, functionalist theories, process-oriented models, sociocultural theories, cognitive linguistic theories, technology-enhanced theories, and process-product models all provide insightful perspectives on the knowledge, abilities, and skills needed for translators. By including these theoretical stances in the translation curriculum, teachers can make sure that students get a thorough education that is in line with both the theoretical foundations of the discipline and the technical innovations reshaping the translation scene (Khasawneh, 2022a).

### 2.3 Integrating Technology in Translation Curriculum Design

To successfully incorporate technology, especially artificial intelligence-based translation tools, into translation curricula, a variety of pedagogical techniques have been investigated. The blended learning paradigm is one strategy that mixes conventional in-person training with digital elements (Chapelle, 2003). With blended learning, students may participate in technologically enhanced activities while still getting the advantages of face-to-face contact with classmates and instructors. Additionally, according to Bergmann and Sams (2012), the flipped classroom strategy includes students accessing course materials and AI-based translation tools beyond the classroom, freeing up in-class time for group projects, debates, and customized feedback.

Studies have looked at several teaching strategies for integrating AI-based translation technologies into translation curricula. Students may practice utilizing artificial intelligence (AI) technologies in controlled, realistic circumstances, for instance, via simulation activities (Doherty, 2021). According to Huertas-Barros (2020), collaborative translation projects encourage cooperation and peer learning while employing AI technologies for effective translation operations. Additionally, interactive online platforms provide students with a user-friendly and engaging way to interact with AI technology, such as virtual translation environments (Biel et al., 2019).

Technology must be included in translation programs using sound curriculum design concepts. The synchronization of learning objectives with the incorporation of AI-based translation tools is one guiding concept (Gambier et al., 2020). This entails specifying the targeted learning objectives in detail and making sure that the use of technology aids in achieving these objectives. Additionally, Vygotsky's (1978) discussion of the scaffolding principle may be used to construct a translation curriculum using AI technologies. Scaffolding is giving students the right help and direction as they develop their abilities and learn to utilize AI technology successfully.

There are several difficulties and things to think about when integrating AI-based translation systems into translation programs. It is important to address the ethical issues raised by machine translation, such as data ownership and privacy, bias in training data, and possible employment displacement (Way, 2018). As diverse languages and cultures may offer particular difficulties for machine translation, the cultural consequences of using AI technologies in translation should also be taken into account (O'Hagan, 2019). To further ensure that AI technologies improve students' learning experiences rather than substitute human-centered abilities, learner-centered methods are essential (Toral et al., 2020). Comprehensive translation education must strike a balance between the development of human abilities like critical thinking, cultural sensitivity, and creativity, as well as the application of AI technologies.

To effectively integrate technology into translation curricula, instructors must have the necessary professional development (Doherty, 2021). Teachers must get training on how to utilize AI-based translation tools effectively and on how to direct their students' usage of these tools. Workshops, conferences, and online courses are a few examples of professional development activities that may assist educators in investigating cutting-edge teaching strategies and keeping up with technology changes (Dragsted, 2019). The effective incorporation of technology in translation curricula may also be attributed to collaboration and the exchange of best practices among educators via professional networks (Koskinen, 2019).

When integrating AI-based translation technologies into a translation curriculum, it is crucial to provide accessible and dependable technological infrastructure. For students to properly interact with AI technology, there should be access to the necessary gear, software, and internet connection. Institutions must provide assistance and resources to resolve technological issues and guarantee that all students have equal access to these tools (Huet et al., 2019).

It is important to carefully evaluate pedagogical approaches, instructional methodologies, curriculum design concepts, obstacles, and teacher professional development when integrating technology, especially AI-based translation tools, into translation curricula. A thorough and well-rounded technology integration in translation education must address ethical issues, cultural consequences, and learner-centered strategies. The advantages of AI-based translation technologies may be used in professional practice by teachers by integrating these insights into translation courses, enabling students to negotiate the changing translation environment.

### **3. Study Methodology**

#### *3.1 Study Design*

This research is a survey study of the perspectives of artificial intelligence experts and language instructors on the pedagogical processes for aligning translation curricula with recent technological advancements. The choice of survey design is to be able to gather information from as many stakeholders as possible to make informed conclusions. Following the adoption of a survey strategy, the study further implements a quantitative research approach to ensure the collection of numerical data.

#### *3.2 Study Community*

The main members of this study community include artificial intelligence experts and language teachers. Artificial intelligence experts are culled from different industries, mainly in digital communication and social networking systems. They mainly focus on the development of different artificial intelligence systems that can enhance communication across languages and groups. Language teachers are significant in teaching translation. We focused on university lecturers who teach both foreign language and translation.

#### *3.3 Study Sampling*

The sample of the study was structured using purposive sampling as the participants were strategically selected based on the identified criteria for participation. A total of 83 language and translation lecturers were selected for the study, and 151 artificial intelligence experts from ten Jordanian universities during the academic year 2022-2023. Therefore, the study sample size is a total of 234 participants.

#### *3.4 Study Tools*

The tool for data collection for this study is a digitally designed questionnaire. The question was structured in four forms, as listed and explained below:

- i. The first section of the questionnaire contains demographic variables, including age, gender, highest academic qualification, and years of experience in the profession.
- ii. The second part of the questionnaire focuses on the first research questions. Four question items were developed with a 3-point Likert scale to answer the study questions.
- iii. The third segment of the questionnaire was designed with research question two, wherein four question items were developed from the research question. The question items are structured with a 3-point Likert scale (agree, neutral, and disagree).
- iv. The last section of the questionnaire was developed from the third research question, using a 3-point Likert scale.

#### *3.5 Validation of Study Tool*

To validate the use of a questionnaire for the study, and to certify the capacity of the question items in generating the required study data, an expert review strategy was implemented. Two artificial intelligence enthusiasts and two professors in translation studies participated in the expert review. Their views, suggestions, and amendments were duly incorporated

before the questionnaires were distributed to the study participants.

3.6 Analysis Procedure

All the analyses are conducted using the descriptive statistics method. The percentile values of the Likert scale variables were calculated and presented in descriptive statistics tables. The tables also contain the mean and standard deviations of the question items. The findings from responses of the study population form the basis for discussion.

4. Results and Discussions

4.1 Results

The results of the data collected are presented in different sections, starting from the demographic variables to the results of the research questions.

Table 1. Result of the Demographic Variables

Variables	Items	Repetitions	Percentages
Gender	Male	197	84.19
	Female	37	15.81
Age range	20-29	83	35.48
	30-39	99	42.3
	40 years and above	52	22.22
Highest academic qualification	Bachelors	51	21.79
	Masters	139	59.4
	PhD	44	18.9
Years of experience	1-4 years	62	26.5
	5-9 years	127	54.27
	10 years and above	45	19.23

The findings of the demographic variables are summarized thus:

- I. More than 84% indicated that they are male participants, while the remaining 15.81% are female participants.
  - II. The participants were also grouped according to age range. Those who are between 20 and 29 years are about 35.48% of the total study population, while those between 30 and 39 years at about 42.3% of the sample. Lastly, those who are 40 years and above represented the smallest margin of the participants at 22.22% of the study population.
  - III. In terms of the highest academic qualification obtained by the participants, those who obtained a bachelor’s degree are at 18.9%, those who obtained a master’s degree are at 59.4%, and those who obtained a PhD are at about 21.79%.
  - IV. In terms of years of experience in teaching translation or artificial intelligence profession, those who have been working between 1 and 4 years are at 19.23%, those who have been working for 5-9 years are at 54.27%, while those who have been working for 10 years or more are at 26% of the study population.
- A. What pedagogical strategies and teaching techniques work optimally for incorporating AI-based translation technologies into translation curricula?**

The first research question is designed to elicit information on strategies that are most suitable for integrating AI-based strategies into translation curricula. The findings are summarized in the following table.

Table 2. Result of Research Question One

Question Item	Agree	Neutral	Disagree	Mean	Std. Dev.
The utilization of task-based instructional methods incorporating AI-based translation technology improves students' ability to use their translation skills and expertise in real-world situations.	65.39	10.25	24.36	3.52	1.79
Students' capacity to function well in a translation environment driven by technology is improved by the inclusion of collaborative projects that entail team-based translation activities using AI-based translation systems.	82.06	7.26	10.68	4.17	0.96
The use of a blended learning strategy that blends conventional classroom teaching with online materials and AI-based translation tools improves students' comprehension and use of AI technology in translation practice.	88.47	3.42	8.11	4.83	0.61
The incorporation of reflective exercises and self-evaluation tasks that ask students to analyze their usage of AI-based translation technology critically improves their metacognitive awareness and self-directed learning abilities.	76.49	5.56	17.96	3.98	0.86

Considering the need to align the translation curriculum with the emerging transformations in artificial intelligence technology, the research respondents expressed their views on different teaching approaches. The findings are summarized below:

- i. The result indicates that 65.39% of the study population agreed that the utilization of task-based instructional methods incorporating AI-based translation technology improves students' ability to use their translation skills and expertise in real-world situations. This was rejected by 24.36% of the respondents, while 10.25% remained neutral. The implication is that the lecturers and A experts who participated in the study accepted the view that one pedagogical strategy and teaching technique that works optimally for incorporating AI-based translation technologies into translation curricula is a task-based method.
- ii. Over 82% of the respondents further indicated that students' capacity to function well in a translation environment driven by technology is improved by the inclusion of collaborative projects that entail team-based translation activities using AI-based translation systems. This was refuted by less than 11%. This finding indicates that the participants accepted that one pedagogical strategy and teaching technique that works optimally for incorporating AI-based translation technologies into translation curricula is team-based teaching strategy.
- iii. Also, over 88% of the respondents agreed that the use of a blended learning strategy that blends conventional classroom teaching with online materials and AI-based translation tools improves students' comprehension and use of AI technology in translation practice. This is a further indication that another pedagogical strategy and teaching technique that works optimally for incorporating AI-based translation technologies into translation curricula is blended learning.
- iv. More than 76% of the study participants further indicated that the incorporation of reflective exercises and self-evaluation tasks that ask students to analyze their usage of AI-based translation technology critically improves their metacognitive awareness and self-directed learning abilities. The reflective teaching method is therefore accepted as another pedagogical strategy and teaching techniques work optimally for incorporating AI-based translation technologies into translation curricula.

The findings generally indicate that task-based approach, team-based strategy, blended learning, and reflective system are the main pedagogical strategies and teaching techniques that work optimally for incorporating AI-based translation technologies into translation curricula. These findings offered a comprehensive response to the first research question.

**B. How can a translation curriculum be created to be in line with technological advancements?**

There is a need to explore how translation curricula can be developed to be in line with technological advancements. Four

questionnaire items were developed from this second research question, focusing on the approaches to integrating technological advancements into the translation curriculum. The findings are summarized in the statistical table below.

Table 3. Result of Research Question Two

Question Items	Agree	Neutral	Disagree	Mean	Std. Dev
Specific lessons or modules on how to educate students on the information and abilities needed to use technology improvements in the translation process should be included in the translation curriculum.	76.49	7.65	15.82	3.98	0.86
The translation curriculum has to be developed in conjunction with industry leaders and AI specialists to guarantee that it is up to date with the most recent technical developments.	90.18	2.56	7.26	4.98	0.62
To keep the translation curriculum current and following market demands, it must be continually reviewed and updated depending on new technology developments.	89.32	4.27	6.41	4.82	0.71
The development of student's critical thinking and adaptation abilities should be emphasized in the translation curriculum to help them successfully navigate the rapidly changing technological environment in the translation business.	91.02	5.99	2.99	5.02	0.48

Some specific actions and activities must be included in the translation curriculum to integrate technological advancements into the translation teaching modules. The table above provides a summary of the views of the research participants on these actions and activities. The findings are summarized below:

- I. More than 76% of the respondents affirm that specific lessons or modules on how to educate students on the information and abilities needed to use technology improvements in the translation process should be included in the translation curriculum. In other words, academic institutions that teach translation must incorporate carefully designed lessons for artificial intelligence innovations in translation into their curriculum if they want to align translation curricula with technological innovations. This proposition was rejected by only 15.82% of the study population, while 7.69% remained neutral. This finding falls within the technological theories in translation which emphasizes the need to continuously design specific lessons that focus on technological innovations in translation pedagogy. As such, experts must focus on designing a translation curriculum that is dynamic and adjustable to the findings of the new lessons.
- II. About 90.18% of the study participants further agreed that the translation curriculum has to be developed in conjunction with industry leaders and AI specialists to guarantee that it is up to date with the most recent technical developments. Academic institutions that teach translation must incorporate or partner with industry leaders and artificial intelligence experts to align translation curricula with technological advancements. Only 7.26% refuted this claim, and 2.56% remained neutral. This finding implies that both the lecturers in translation pedagogy and artificial intelligence experts who participated in the study collectively agree that there is a need for universities to partner with translation industry leaders and artificial intelligence experts in the process of integrating technological enhancements into translation curricula.
- III. Approximately 89% of the respondents agreed that to keep the translation curriculum current and following market demands, it must be continually reviewed and updated depending on new technology developments. Continuous evaluation of the translation curriculum is another action or activity that is required to align the translation curriculum with technological advancements. Technological innovations are continuously changing, and the translation curriculum must also be continuously reviewed to reflect contemporary innovations.
- IV. Also, over 91% of the participants agreed that the development of student's critical thinking and adaptation abilities should be emphasized in the translation curriculum to help them successfully navigate the rapidly changing technological environment in the translation business. Technological innovations are anchored to



critical thinking and creativity. As such, the participants affirm that the translation curriculum must reflect creativity and critical thinking for the students.

Overall, the findings generated from the second research question suggest that the main strategies to ensure alignment of translation curriculum with technological advancements are careful designing of specific lessons for technology in translation, formation of partnerships between industry players (translation industry leaders and AI experts) and translation curriculum designers, continuous review of the curriculum, and inclusion of creativity and critical thinking for the students.

**C. How can translation curricula be modified to foster the core competencies and skills needed by translators in the AI-driven translation landscape?**

The last research question focused on exploring the strategies to modify and enhance the core skills needed for the translation profession in the AI-driven translation industry. Four questionnaire items were developed from this research question to advance this discussion.

Table 4. Result of Research Question Three

Question Items	Agree	Neutral	Disagree	Mean	Std. Dev
To guarantee that the translation curriculum stays current and nurtures the fundamental competencies and abilities required in the AI-driven translation industry, it is essential to continuously evaluate and change it.	92.74	3.84	3.41	5.17	0.43
Students are more prepared to work in the AI-driven translation industry when practical training sessions and seminars on these technologies are included in the curriculum.	94.45	1.7	3.84	5.31	0.39
The development of critical thinking and problem-solving abilities should be emphasized in the translation curricula so that translators can use AI technology to successfully handle translation issues.	85.89	8.12	5.98	4.62	0.94
The AI-related competencies and abilities that translators need to successfully use AI technology in their work should be included in specialist courses or modules in the translation curriculum.	88.89	4.7	6.41	4.79	0.81

The views of the study participants offer further insights into the third research question, supporting the claim that certain actions are necessary to be included in the translation curriculum to prepare translation students for the AI-driven translation market. The findings are summarized thus:

- i. More than 92% of the study participants agreed that to guarantee that the translation curriculum remains current and nurtures the fundamental competencies and skills required in the AI-driven translation industry, it is essential to continuously evaluate and change it. Less than 4% refuted this claim, supporting the fact that there is a need for consistent review and evaluation of the translation curriculum if the main aim is to train translators who can always function in the technologically driven translation industry.
- ii. About 94.45% of the respondents further indicated that students are more prepared to work in the AI-driven translation industry when practical training sessions and seminars on these technologies are included in the curriculum. Academic institutions that teach translation must incorporate practical training sessions and seminars on translation into their curriculum to help the students gain the necessary skills to thrive in the industry.
- iii. Almost 86% of the study population affirmed that the development of critical thinking and problem-solving abilities should be emphasized in the translation curricula so that translators can use AI technology to successfully handle translation issues. Only 5.98% refuted this claim, and 8.12% remained neutral, indicating that developing and integrating critical thinking and problem-solving skills into the translation curriculum is fundamental to effectively function in the contemporary translation industry.

- iv. Similarly, 88.89% of the participants agreed that the AI-related competencies and abilities that translators need to successfully use AI technology in their work should be included in specialist courses or modules in the translation curriculum.

Overall, the participants affirm that certain actions or activities must be included in the translation curriculum to effectively align with technological advancements and help students learn the necessary skills to function in the contemporary translation industry. This is a suitable response to the third research question.

#### *4.2 Discussions*

This analysis has offered a critical evaluation of the perspectives of the lecturers and AI experts who participated in the study, mainly on the approaches and strategies to align translation curriculum with technological advancements, mainly artificial intelligence innovations. Using statistical tools, the study evaluated and provided responses to the three research questions. The findings are further discussed in this section.

The first research question focused on unveiling pedagogical strategies and teaching techniques that work optimally for incorporating AI-based translation technologies into translation curricula. According to the study's findings, 65.39% of participants believed that using a task-based learning approach that incorporates AI-based translation technology enhances students' capacity to use their translation knowledge and abilities in practical settings. About 24.36% of the respondents rejected this, while 10.25% were undecided. The task-based approach is one pedagogical strategy and teaching style that works well for introducing AI-based translation technologies into the translation curriculum, according to the instructors and AI specialists who took part in the research. More than 82% of respondents went on to assert that the inclusion of collaborative projects that include team-based translation activities employing AI-based translation systems improves students' ability to perform successfully in a translation industry driven by technology. Less than 11% of those polled disagreed with this. This result shows that the participants agreed that a team-based teaching approach is one pedagogical strategy and teaching method that functions well for integrating AI-based translation technology into translation curricula.

Additionally, more than 88% of respondents agreed that a blended learning approach, which combines traditional classroom instruction with online resources and AI-based translation tools, enhances students' understanding and use of AI technology in translation practice. This is yet another proof that blended learning is a pedagogical approach and a teaching method that excels at integrating AI-based translation technology into the translation curriculum.

More than 76% of the study's participants agreed that adding reflective activities and self-evaluation assignments that require students to critically evaluate how they use AI-based translation technology enhances their capacity for metacognition and self-directed learning. As a result, reflective teaching methods are acknowledged as another pedagogical strategy and teaching style that integrates AI-based translation technology into the translation curriculum most effectively. The results usually show that the key pedagogical methods and teaching approaches that work well for integrating AI-based translation technologies into translation curricula include a task-based approach, team-based strategy, blended learning, and reflective system. These results provided a thorough answer to the first study question.

The second research question focuses on how a translation curriculum can be created to be in line with technological advancements. More than 76% of respondents agree that the translation curriculum should contain particular lessons or modules on how to teach students the knowledge and skills required to leverage technological advancements in the translation process. To match translation curricula with technological advancements, academic institutions that teach translation must include thoughtfully created lessons for artificial intelligence developments in translation into their curricula. Only 15.82% of the participants in the research disagreed, and 7.69% were undecided. This finding is consistent with technical theories in translation, which highlight the necessity to continually create targeted courses that concentrate on technology advancements in translation education. Therefore, specialists must concentrate on creating dynamic translation curricula that can adapt to the results of the new courses.

About 90.18% of research participants also agreed that to ensure that the translation curriculum is current with the most recent technological advancements, it must be produced in collaboration with experts in the field and AI. To ensure that translation curricula keep up with technological changes, academic institutions that teach translation must collaborate with or cooperate with business leaders and specialists in artificial intelligence. 2.56% remained neutral, while just 7.26% disagreed with this assertion. This finding implies that universities should collaborate with leaders in the translation industry and experts in artificial intelligence to integrate technological advancements into the curriculum. Both lecturers in translation pedagogy and artificial intelligence experts who participated in the study concurred on this point.

Approximately 89% of respondents agreed that the translation curriculum must be continuously evaluated and revised in light of new technological advancements to remain relevant and in line with market expectations. Another step or activity necessary to integrate the translation curriculum with technical improvements is an ongoing review of the curriculum. Since technological advancements are always evolving, the translation curriculum must also be evaluated often to reflect

these advancements. Additionally, more than 91% of the participants agreed that to enable students to effectively traverse the quickly evolving technology environment in the translation sector, the development of their critical thinking and adaptation skills should be stressed in the translation curriculum. Critical thinking and creativity are the foundation of technological advances. The panelists agree that translation curricula should encourage students to think critically and creatively.

Overall, the results from the second research question indicate that careful design of specific lessons for technology in translation, partnership between industry players (leaders in the translation industry and AI experts), ongoing curriculum review, and inclusion of creativity and critical thinking for translation are the main strategies to ensure alignment of translation curriculum with technological advancements.

The focus of the third research question was to explore how translation curricula can be modified to foster the core competencies and skills needed by translators in the AI-driven translation landscape. More than 92% of research participants felt that it is crucial to continually analyze and adapt the translation curriculum to ensure that it stays current and fosters the key competencies and abilities needed in the AI-driven translation business. Less than 4% of respondents disputed this assertion, which is evidence that the translation curriculum has to be regularly reviewed and evaluated if the primary goal is to teach translators who can always work in the technologically advanced translation sector. Further, according to around 94.45% of the respondents, when these technologies are included in practical training sessions and seminars as part of the curriculum, students are better equipped to work in the AI-driven translation sector. To provide their students with the skills they need to succeed in the field, academic institutions that teach translation must include practical training sessions and seminars on translation in their curricula.

The development of critical thinking and problem-solving skills should be prioritized in the translation curriculum, according to almost 86% of the study's participants, so that translators may effectively employ AI technology to tackle translation challenges. Only 5.98% of respondents disputed this assertion, and 8.12% remained unconvinced, showing that critical thinking and problem-solving skills development and integration into the translation curriculum are essential for success in the modern translation profession. Similarly, 88.89% of participants agreed that specialty courses or modules in the translation curriculum should include the AI-related competencies and abilities that translators need to effectively employ AI technology in their work.

## 5. Conclusions

This study has explored the nature and factors that can facilitate the integration of technological advancements into translation curricula. The study expounded on methods, approaches, and strategies to aligning translation curricula with technological enhancements in the effort to train translators who are good to function in the AI-driven translation industry. The study community included 83 university lecturers in translation studies and 151 artificial intelligence experts. The study design is a survey approach, and the strategy of the research is quantitative. Data was collected using a questionnaire and analysis was conducted using relevant descriptive statistics tools, including the percentile values of the Likert scale, the mean, and the standard deviation. Three research questions were posed which form the basis for data collection and analysis. The findings generally indicate that task-based approach, team-based strategy, blended learning, and reflective system are the main pedagogical strategies and teaching techniques that work optimally for incorporating AI-based translation technologies into translation curricula. Over 88% of the respondents agreed that the use of a blended learning strategy that blends conventional classroom teaching with online materials and AI-based translation tools improves students' comprehension and use of AI technology in translation practice, while more than 87% affirmed that reflective teaching is another strategy to ensure incorporation of technological advancement in translation curriculum. The findings generated from the data analysis further suggest that the main strategies to ensure alignment of translation curriculum with technological advancements are careful designing of specific lessons for technology in translation, formation of partnerships between industry players (translation industry leaders and AI experts), and translation curriculum designers, continuous review of the curriculum, and inclusion of creativity and critical thinking for the students. It is thus concluded that translation curriculum designers must always review the translation curriculum, partner with translation industry leaders and AI experts, and integrate critical thinking and creativity into the translation curriculum system. This is to ensure that the trained translators can function effectively in the AI-driven translation industry.

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## Authors contributions

Dr. Zuhair were responsible for study design and revising. Dr. khasawneh was responsible for data collection. Dr. khasawneh drafted the manuscript and Dr. Zuhair revised it. All authors read and approved the final manuscript. In this

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