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How Does Generative AI Help College L2 Learners' Engage in Translation

Anzhuo Li

College of International Business, Liaoning Normal University, Dalian, China
13236682337@163.com

Abstract. The purpose of this research is to investigate the four dimensions of college L2 learners' engagement with generative AI (GenAI) in translation and the interactive between the four dimensions, in order to provide theoretical and practical references for the optimal application of GenAI in translation education. In the context of the rapid digital transformation in translation education, the engagement with GenAI has become increasingly important for improving teaching the effectiveness. GenAI can effectively enhance cognitive, behavioral, emotional, and agentic engagement in translation by decreasing cognitive load, facilitating proactive operation, evoking positive emotions, and supporting self-regulation, while unregulated GenAI use cause overdependence, academic integrity risks and negative impacts. Current research on GenAI engagement is insufficient in exploring the interaction between the four dimensions of engagement and insufficient in exploring agentic engagement in the context of GenAI-supported translation learning. It also reveals obvious research gaps in cross-dimensional interaction and agentic engagement exploration. This study provides practical guidance on the reasonable application of GenAI in translation teaching, guiding educators, and learners to make effective use of GenAI tools effectively and avoid overdependence and academic integrity risks.

Keywords: generative AI (GenAI), translation, engagement, literature review

1. Introduction

Generative artificial intelligence (GenAI) has emerged as a transformative force in higher education [1]. Within second language (L2) acquisition, college learners have been using GenAI to assist in the acquisition of translation knowledge and in becoming more engaged in the translation process [2,3]. Though the role of AI in education has been recognized to a certain extent, the engagement of second language acquisition learners with GenAI in the translation process has been found to be under researched, creating a research gap with regard to the exploration of the intricate engagement with GenAI in the translation process and the overall student learning experience. Hence, it is essential to explore the role of GenAI in the acquisition of knowledge by second language acquisition learners and analyze the engagement with GenAI to explore the most sustainable mode of education.

Engagement refers to the measure of involvement of individuals with regard to specific activities or tasks cognitively, behaviorally, emotionally, and agentically through active participation and

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interaction [5]. The four dimensions of engagement are employed for this research to explore the engagement of L2 learners with regard to GenAI for translation tasks. Firstly, cognitive engagement refers to deeper processing and self-regulation of evaluation of Gen AI translation [6]. Secondly, behavioral engagement, which serves as the mediator between attitude and usage, entails observable actions including initiation of tools, revision of output, and persistence of tasks [7]. Thirdly, emotional engagement, which refers to affective engagement, entails positive inner attitude towards the task and external environment [8,9]. Lastly, agentic engagement refers to proactive initiative and ownership of Gen AI usage of translation tasks.

The major aim of this research is to explore and extend the four dimensions of engagement and fill in the gaps in order to enhance the concrete interplay between GenAI and different dimensional engagement of L2 learners in translation practice [10]. Besides, another aim of this research is to meet the dual pressing needs in the fields of translation and practice. The pressing need in translation and practice is felt due to the popularization of GenAI in translation practice. The integration of different findings of the four-dimensional engagement will provide a foundation for designing a translation course that incorporates more AI in order to enhance a cross-dimension relationship, behavior, emotion, and cognition in order for learners to benefit from a positive transformation without becoming too dependent on AI.

2. Methods

This study uses the Web of Science database as the major source to conduct a comprehensive and systematic literature review. Moreover, the advanced search can be considered as a function to craft a multi-layered retrieval strategy. By adding another row of date range, publication time between 2023 and 2026 is the best choice to be set because of the recently popular topic, "generative artificial intelligence", ensuring the inclusion of contemporary and evidence-based research. In terms of other keywords appeared in the abstract are employed for the modification of GenAI, such as "cognitive engagement", "behavioral engagement", "emotional engagement", and "agentic engagement". Therefore, under the condition of maintaining the consistency of "GenAI" and "translation", match "cognitive engagement" with the two core topics, yielding a total of 4 pieces of literature. However, no results are found by retrieving "behavioral engagement" and "agentic engagement" due to narrow search parameters. Then, the study assigns "behavioral engagement" to "GenAI" and "translation" respectively. For "agentic engagement", the same setting has been made. The total primary results are 130 by adding all kinds of retrieval outcomes. Ultimately, after deleting repeated and unsuitable literature, 45 articles remained.

3. Engagement with using GenAI in translation

3.1. Cognitive engagement

Cognitive engagement refers to the psychological process of learners in learning tasks [11]. Cognitive engagement changes from merely passive responding to things to actively constructing knowledge [12]. Deep learning happens as learners progress from passive activities to active engagement [13]. As the concept of "cognitive engagement" evolves, it assists in developing a multi-dimensional idea of "cognition + metacognition" [12].

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3.1.1. Cognition

The cognitive engagement of L2 learners in translating using GenAI is indicated by changed data processing patterns and reduced mental cognitive stress for the learners [12]. GenAI helps learners in reducing extraneous cognitive load and assisting in problem-solving through doing language tasks such as word or sentence modification [14]. The application of GenAI tools in the translation process reduces the cognitive load of L2 learners from trivial mistakes, allowing them to focus more on improving the translations. The improvement of translations using GenAI also improves the depth of cognitive process and strategic thinking abilities of L2 learners through increasing their confidence and competence [15].

3.1.2. Metacognition

Metacognition, the ability of humans to recognize correct decisions, is a useful method employed to connect with learning and development [16]. GenAI acts as a metacognitive support system, which provides L2 learners with accessible guidance from AI devices, including translation goals, choosing the appropriate strategies in AI devices to apply, and evaluating the rationality of the results obtained from GenAI [17]. However, the uncontrolled use of AI devices can lead to metacognitive inactivity [18]. Quality academic scaffolding can help develop the metacognitive control skills of L2 learners to improve them to recognize the limitations of using AI devices and adaptively change translation strategies according to their needs. The correct and appropriate use of AI devices can facilitate metacognitive thinking in translation for L2 learners, which balances the extent to which individuals are engaged in using it for meaning and contextual work [18].

The interactive relationship between cognitive and metacognitive engagement in various translation situations, as well as the significance of individual differences in such engagement, has not been fully explored in the existing literature.

3.2. Behavioral engagement

Behavioral engagement refers to L2 learners' intensity of involvement within academic and non-academic activities in the school context [19]. Apart from cognitive engagement, behavioral engagement has also been developed from initial unidimensional research on learner engagement to a multidimensional construct [20]. Three dimensions can be summarized: active operational behaviors, strategic application behaviors, and time investment with sustained engagement are summarized.

3.2.1. Active operational behaviors

Active operational behaviors focus on the proactive behavior of L2 learners between leaders and employees [21]. Regarding GenAI translation, it can be said that it is proactive interaction with GenAI translation tools and proactive engagement with AI translation output. This includes proactive engagement with functions such as the design of customized prompts, model selection, and functional modification based on particular translation needs [22]. The most critical part is the active verification and modification of GenAI translation outputs, rather than accepting them uncritically. For instance, learners who actively mark the segments with the help of AI and actively verify the AI translation outputs against the source text show active operational engagement. Although submitting the AI output without marking any changes would enhance the speed and efficiency of translation, these activities do not meet the criterion of academic integrity [23]. This

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highlights that it is difficult to maintain the efficiency of translation and the ethical concerns associated with technology using GenAI translation [24].

3.2.2. Strategic application behaviors

Strategic application behavior entails the selective and combined use of translation strategies facilitated by GenAI. L2 learners make use of GenAI in executing various strategies, such as segmenting complex sentences for better grammatical analysis, using AI for the maintenance of word forms, or using AI for subsequent revisions. Another form of tactical interaction is the integration of various software, such as the integration of GenAI with lexicons for better accuracy and appropriateness. Li, Zhao, and Bian discovered that motivated learners always engage in interaction with AI, refining the vocabulary, enhancing the coherence of the texts, and making revisions to meet the demands of various scenarios instead of relying on the automatic results. This leads to better translation quality and self-awareness, as the L2 learners are able to recognize the gaps in their language and cultural knowledge by comparing the suggestions from the AI with their own versions [27].

3.2.3. Time involvement and sustained engagement

On the other hand, time involvement and sustained engagement refer to the duration, continuity, and regularity of translation activities facilitated by GenAI [28]. This includes in-task duration, such as single-session time investment and cumulative time investment, as well as task persistence, which includes lower task dropout rates facilitated by GenAI support [15]. It also includes task engagement outside of class lessons, such as the rate at which L2 learners voluntarily engage in translation activities facilitated by GenAI independently. Time involvement, which includes sustained engagement, emphasizes the regularity of using GenAI, such as using the tool repeatedly throughout different learning scenarios instead of using it once or sometimes [29]. This is significant for skill development while maintaining stable views and adapting strategies for using GenAI in changing working conditions [30].

Briefly, this practice-based approach is one that facilitates the clear and precise analysis of behavioral engagement with the support of AI for translation. This approach shows the effect that the combined effort of the operation, strategic use, and time investment have on the development of translation skills for L2 learners with GenAI. Upcoming research should focus on the combined effect that these areas have with emotional and agentic engagement to show the effect of learning translation with AI.

3.3. Emotional engagement

Emotional engagement explores the affective responses and psychological connections that learners develop with regard to the learning activities. Emotional engagement has been observed to comprise positive emotional engagement, which includes interest and enjoyment, and negative emotional engagement, which includes anxiety [6]. Emotional engagement has been observed to develop from a one-dimensional reaction to learning to a multi-dimensional reaction to learning and has been related to both cognitive engagement and behavioral engagement. Emotional engagement comprises emotional bonding, fluctuation of emotional response, and attitudes toward GenAI assistance [12].

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3.3.1. Emotional bonding

Emotional bonding is described as the establishment of positive emotional ties with translation tasks. This is marked by a greater interest in translation tasks due to help from AI, a willingness to share GenAI methods and background information with classmates or instructors, and a positive look forward to changes in the programs and new features [31]. In a learning context, learners who freely talk about AI methods or work on AI-assisted tasks with classmates may establish a greater sense of togetherness. This improves traditional practices such as academic integrity and support for one another in coping with limitations posed by AI. On the other hand, learners who feel left out of conversations about AI may feel isolated and lack motivation to participate [32].

3.3.2. Fluctuation of emotional reaction

Fluctuation of emotional reaction describes the frequency, amplitude, and directional shifts of affective states between positivity and negativity while translating with AI assistance [33]. Positive feelings involve a feeling of success, less work stress, pleasure, and more attention due to things such as quick writing and words improving [34,35]. Negative feelings might feature irritation, worry, or growing reliance, frequently often due to wrong answers, cultural mismatches, or doubts regarding dependability [36]. Emotional stability means the degree of change a learner's emotional state when working with an AI system that is performing differently. According to research, L2 learners report a higher degree of attention and concentration when they are using an AI translation tool. Still, negative moods appear when AI results show mistakes or cultural problems, leading to frustration and doubts about correctness [37]. These feeling changes, in turn, affect a learner's persistence in making better translations. Learners feeling good are more likely to keep making GenAI translations better, whereas those feeling bad might quit too early [4].

3.3.3. Attitudes toward GenAI assistance

Attitudinal tendencies capture learners' evaluative stances toward GenAI in translation practice. This includes learners' approval of GenAI in translation practice, learners' perception of GenAI as trustworthy in translation practice, and learners' acceptance of combining GenAI with translation practice [38]. L2 learners often notice the enjoyment factor (pleasure from checking out GenAI features) and the practical factor (better speed for expert translation) of creative AI, but voice worries about the skill factor (dangers of depending too much, weakening translation ability) and the resource factor (hours and work needed to check AI results) [39].

Current work has looked at feeling involved aspects in GenAI translation, but few have checked the active link between feeling responses, community connection, and worth views. More research later should use long-term plans to watch these links and make set plans, like AI literacy classes, to ease bad feelings and grow steady, lasting involvement with GenAI in translation teaching.

3.4. Agentic engagement

Agentic engagement is defined as the constructive contribution that learners make to the flow of the instruction they receive. Agentic engagement is a dynamic construct developed through the evolution of the engagement theory and further shaped by the incorporation of agentic theory; it has shifted its focus from the learner's passive engagement to his or her active self-regulation. Reeve and Tseng [40] describe the central dimension of agentic engagement as self-regulation and reflection through the learner's motivation.

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3.4.1. Self-regulation and reflection

Self-regulation and reflection entail careful watching and changing as needed to make the Gen AI translation steps better. The learners' involvement in the process requires watching the results and studying the main reasons for the mistakes. The next step involves changing the prompts or the model's setting. In most cases, the reflection involves what is good and what is not so good about the help they get from the AI, what they learned from the finished work, and how they can make their methods better for later use. This approach helps the learners to avoid being overly dependent and to be independent in the field of translation. By adopting Reeve's [43] ideas, the learners' involvement in the process requires the Gen AI to be considered an important component of the learners' self-initiated learning support and not just as a tool to get the job done. This approach helps the learners to think more deeply and independently and to be more interested in the learning process. This approach also improves the learners' ability to better comprehend their own thinking and express themselves within the context of intercultural communication in the field of translation [44].

Nevertheless, the available research that has looked at the manner in which L2 learners make use of AI in translation assistance has concentrated on the manner in which they act and think but not sufficiently on the manner in which agentic engagement is performed as an independent construct that is driven by the learner. Thus, the manner in which learner agency impacts the effectiveness of GenAI in translation instruction has not been sufficiently researched. To remedy this in the future, there needs to be an avenue to measure agentic engagement in translation with the help of AI, to evaluate whether it impacts the translation skills of the L2 learner, and to plan for the exploration of whether it is able to assist the learner in the development of the learner's own supportive translation learning environment.

4. Gains and losses of using generative AI in translation

In the cognitive domain, GenAI is beneficial in the following aspects for the L2 learner in the translation task: it helps in the minimization of the extraneous cognitive load and mental stress, which enables the L2 learner to be more focused on the improvement of the translation product and not the surface errors, which at the same time enables the L2 learner to feel more confident and competent [14,41]. As a support system for the metacognitive domain, it provides easy access to the L2 learner, helps in the setting of the translation goals and the selection of the strategies [17]. In the behavioral domain, it helps in the proactive operational and strategic application behavior and the maintenance of the engagement in the translation task through the minimization of the premature termination of the tasks [15]. In the emotional domain, it helps in the triggering of the positive emotions such as the feeling of achievement and the minimization of the workload, and the bonding through the shared learning with the help of the AI. In the agentic domain, it helps in the self-regulation and the reflection, which enables the L2 learner to optimize the translation processes and become independent.

However, it should be noted that translation with the help of Gen AI would also bring some losses. For instance, if uncontrolled over-dependence on Gen AI takes place, metacognitive inactivity would occur, which would affect the translation competence of L2 learners negatively since they would not be interested in thinking, improving, and reflecting on the linguistic output. Moreover, if L2 learners use the content of Gen AI translation without proper verification and rational judgment, it would not just eliminate the feelings of empowerment resulting from the development of their own linguistic competence but would also bring about academic integrity issues in translation practice [45]. In addition, it would bring negative emotions like frustration and

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anxiety if the translation content of Gen AI is wrong and does not match the culture and would cause social isolation for L2 learners due to AI bias in culture [36]. Besides, it would be hard to find the right balance between translation efficiency and AI-related translation ethics; moreover, it would demand additional investment of time and engagement to verify the output of AI [24].

5. Research gaps and future research direction

While the existing studies have confirmed the presence of various dimensions of engagement in GenAI translation, there are critical research gaps that need to be addressed in the future. First off, the interaction mechanism of cognitive engagement with metacognition in various GenAI translation contexts requires empirical examination. Furthermore, the aspect of individual differences in engagement with GenAI translation by L2 learners has not been thoroughly examined using the combined findings of both qualitative and quantitative data. In addition, there was no dynamic monitoring of the changes in engagement patterns over the period of learning. The cause-and-effect relationship of emotional responses, connection with the community, and value perceptions in emotional engagement has not been confirmed in any study. Similarly, agentic engagement as a separate dimension of engagement in GenAI translation has not been thoroughly examined. There was no specific measurement tool designed to measure agentic engagement in GenAI translation contexts. The effectiveness of GenAI translation tools in L2 translation instruction was not examined in the context of agentic engagement.

To fix these gaps, future research ought to use a combined method and long-term plans to check the interplay between various engagement dimensions and personal variations, develop context-specific scales for agentic engagement, implement AI literacy intervention programs for L2 learners and instructors, and carry out testing and empirical research to examine instructional strategies. A comprehensive analytical framework should also be established to integrate behavioral, cognitive, emotional, and agentic engagement, revealing the synergistic effects on GenAI translation learning.

6. Conclusion

This literature review intends to examine the four dimensions of college L2 learners' engagement in GenAI translation, make clear how each aspect connects, examine the benefits and drawbacks of using GenAI in translation study, and point out current research voids to offer a foundation for better GenAI translation instruction. The findings show that GenAI successfully increases cognitive engagement by lowering mental strain and aiding metacognition, encourages active engagement through deliberate action and continued effort, draws favorable emotional engagement while sparking negative feelings such as annoyance, and promotes active engagement through self-regulation and reflection, but unregulated use outputs lead to over-dependence and threats to academic integrity. Moreover, the reciprocal support among the four engagement dimensions has not been studied enough, with clear gaps in research concerning active engagement and how the different dimensions influence each other.

This research presents several implications. For teaching, instructors ought to create courses on AI literacy and direct sensible GenAI use to prevent excessive reliance. For studying, learners must strengthen proactive checking and their ability to think about their own thinking when using GenAI for translation. For assessment, its standards need to include the skill of using AI tools and the caliber of the translation to show complete learning results.

This research has certain limitations in that it does not conduct an in-depth analysis from the perspective of specific language types. Future research can employ combined methodologies to

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investigate how the engagement aspects interact across dimensions, create a distinct tool for measuring active engagement, perform actual testing across various language categories, and carry out long-term study of interventions to confirm how well teaching methods that include GenAI for translation actually work, to build a complete model for analyzing engagement in learning assisted by GenAI for translation.

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