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GTALL: A GNMT Model for Foreign Language Education

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Abstract

The world of foreign language education has been immensely influenced by emergent Machine Translation (MT) technologies including Google Translate (GT). Considering that end users' perceptions reflect MT practicality, ample research has been conducted regarding language learners' perceptions on MT use. Yet, investigating Iranian student teachers' perceptions on the use of MT for language learning in higher education has been underestimated. To bridge this gap, semi-structured interviews with twelve student teachers, who were selected through purposive sampling, were conducted by employing the qualitative constructivist grounded theory methodology. A model of GT use in language learning, entitled 'Google Translate-Assisted Language Learning (GTALL)' was proposed. The three main categories (i.e., GT familiarity and use, perceptions, and legitimacy) along with 35 sub-categories at two levels supported the core category of 'implementation of GT in language learning'. The results revealed that despite the participants' general familiarity and use of GT for linguistic purposes, they did not know most of its features. While the student teachers held positive views of GT and did not recognize its use as academic misconduct, their professors frowned upon GT use due to the probable misleading. GT literacy may be a sound proposal to take advantage of this novelty in linguistic endeavors. This study demonstrated considerable pedagogical implications for educational stakeholders. While administrators are recommended to appreciate contemporary pedagogical transformations to fulfill new generation's needs, both professors and students are encouraged to improve digital literacy and take advantage of GT for greater educational achievements.

Keywords: GTALL, machine translation, GNMT, grounded theory, perceptions

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INTRODUCTION

The European Association for Machine Translation (EAMT) defines MT as "the application of computers to the task of translating texts from one natural language to another." (https://eamt.org/what-is-machinetranslation). Machine Translation (MT) is one of the Natural Language Processing (NLP) technologies implemented and investigated in Intelligent Computer-Assisted Language Learning (ICALL) research (Lu, 2018). MT, not being launched primarily as an educational tool (Tsai, 2022), has always been a source of controversy in language education (Carré et al., 2022, p. 187). While some scholars pointed out MT drawbacks and their probable side effects on language learning (Darancik, 2016; White & Heidrich, 2013), its popularity and practicality in diverse areas of language acquisition have been confirmed (Van Lieshout & Cardoso, 2022; Woo & Choi, 2021).

The main reason for such mixed opinions is that technological advances have led to marked improvements in MT output quality. Prior to the launch of Google Neural Machine Translation (GNMT) in 2016 (Tsai, 2022), for instance, MT research reported numerous errors in renditions at sentence or discourse levels requiring post-editing to achieve the desired text quality (Case, 2015). In contrast, GNMT's highly accurate (Briggs, 2018) and comprehensible (Maghsoudi & Mirzaeian, 2020) translations resulted in more satisfaction on the part of users (Lin, 2022; Stapleton, 2021). Today, due to Artificial Intelligence (AI) improvements, as researchers (Lee, 2021; Vinall & Hellmich, 2022) claimed, MT outputs dominate human productions and has portrayed a novel view of language education by engaging learners in convenient human-machine interactions (Alhaisoni & Alhaysony, 2017; Clifford et al., 2013).

As technology advances and MT use extends in language learning by learners at diverse levels, this innovation plays a more prominent role in the field. Under such circumstances, end users' perceptions form the best touchstone for the practicality of this service (Levy, 2009). Researchers state that GT per se does not lead to linguistic development; rather, learners'

linguistic competence together with their digital literacy defines software practicality (Fredholm, 2015). In addition, Tsai (2019) described MT use in language learning as a learner-centered approach.

Taking this scenario as a point of departure, a number of studies investigated language learners' perceptions on the use of MT in language learning in diverse educational contexts (e.g., Ata & Debrali, 2021; Briggs, 2018; Chang, 2022). For example, Organ (2022) depicted the alternating nature of learners' perceptions over a ten-year time span in which GT experienced remarkable leaps. Similarly, Ryu et al. (2022) proposed a model called Guided Use of Machine Translation (GUMT) to explore the effect of employing this model on upper-elementary Korean as a foreign (KFL) students' writing and their perceptions in this regard. The participants' reflections revealed that GUMT model has been influential on enhancing learners' self-confidence and self-image of fluency in writing.

Given the growing popularity of GT owing to its quality improvements, especially in English as a foreign language (EFL) context (Groves & Mundt, 2021), it seems imperative to explore the status of GT in diverse educational contexts. Most of the prior studies investigated the effect of language learners' perceptions about the effects of GT use on language skills, especially writing. There has been no attempt to provide a holistic view of the part that GT plays in language learning practices. Therefore, the absence of such a comprehensive theory has brought about a vague picture of the issue under question. Furthermore, there has been few attempts to elicit Iranian student teachers' perceptions on the use of GT for language learning in higher education. This study mainly intended to provide a clearer understanding of what student teachers perceive regarding GT use in their linguistic efforts in higher education. In other words, to explore their level of GT familiarity and use, their perceptions of GT practicality, and legitimacy of GT use in language learning in the academic context have been addressed.

To this end, the authors adopted a constructivist grounded theory methodology and proposed a model of GT use in language learning, entitled

'Google Translate-Assisted Language Learning (GTALL). Construction of a descriptive model through the employment of this methodology sheds light on the nuances of a burgeoning area of inquiry (Tie et al., 2019). The distinguishing feature of the grounded theory methodology is that it paves the way to report some excerpts of the interviews as live instances of student teachers' perceptions regarding the issue.

LITERATURE REVIEW

Vygotsky's Sociocultural Theory (SCT) rests upon the idea that learning is a contextual and mediational phenomenon (Vygotsky, 1978). As Vygotsky argues, social interactions result in an individual's cognitive development in the form of changes in actions and thoughts (Vygotsky, 1986). He considers mediation one of the building blocks of SCT (Lantolf & Poehner, 2014), and enumerates a number of mediators including a system of symbols, a human behavior, and a physical tool (Donato & MacCormick, 1994). Another core concept of this theory is an individual's zone of proximal development (ZPD). Vygotsky defines ZPD as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers (Vygotsky, 1978, p. 86). Accordingly, language learners are capable of achieving their ZPD in the presence of relevant mediators such as technological tools (Mohammed Qadir & Yousofi, 2021).

New physical tools alter the essence of human activity while the activity itself remains unchanged (Warschauer, 2005). In this sense, MT, as a mediating tool with specific facilities at its disposal, contributes to shaping new efforts, and thus leads to learning (Bahri & Mahadi, 2016; Bin Dahmash, 2020). Given the ever-improving nature of Internet-based technologies and their worldwide application in language education (Soleimanifard et al., 2021), it seems crucial to appraise the affordances of the newly introduced tools and their influences on social interactions

(Donato & McCormick, 1994; Hutchby, 2001). More specifically, it is significant to investigate language learners' and instructors' perceptions towards MT use in their own educational context to have a clear picture of the part that MT plays in foreign language education.

Under the aegis of the tenets of the sociocultural theory, researchers opened up a new line of inquiry- namely MT in foreign language education. MT services first launched in the 1950s for non-linguistic purposes (Stapleton & Kin, 2019), caught the special attention of CALL specialists in the 1990s. Research reported that although DOS-based MT showed only 65% acceptable performance, it can be used as a prioritized feature in language learning (Anderson, 1995). Following this attempt, it was claimed that even though MT systems were not designed as language instructors, assistants, or media, they played reasonable and approving roles in language learning (Parsons, 1996).

In line with MT improvements, since the 2000s, there has been a rise in the number of studies probing into the use of this service in language education, especially those devoted to investigating language learners' attitudes toward its use in their linguistic practices in higher education (Alhaisoni & Alhaysony, 2017; Briggs, 2018; Case, 2015; Clifford et al., 2013; Groves & Mundt, 2015, 2021; Merschel & Munné, 2022; Organ, 2022; Rowe, 2022). The fluctuating essence of the interaction between learners and MT as a result of constant high-tech breakthroughs is reflected in the conflicting viewpoints of the research participants (Briggs, 2018).

In a large-scale survey, Clifford et al. (2013) explored language learners' and instructors' MT use and beliefs about output quality at Duke University. The findings revealed that despite students' awareness of MT inaccuracies, they found it a helpful tool while studying. The instructors, on the other hand, were rather dubious about a beneficial impact on language learning. In 2015, Groves and Mundt evaluated the quality of MT outputs and compared it with international testing standards. They concluded that the grammatical quality of MT renditions corresponded with the lower IELTS proficiency scores. Accordingly, by considering steady MT

improvements, they predicted promising effects of MT on English for Academic Purposes (EAP) practices.

Following their investigations in this regard, Mundt and Groves (2016) advanced the idea of MT legislation in higher education. However, since no such regulation was enacted, to pursue this issue, they interviewed faculty members at two UK universities and questioned MT policy making and legitimacy in higher education. According to interviewees, MT use was more plausible for receptive skills than productive skills. In addition, they believed that despite the absence of a concrete policy in this regard, making such prescriptive rules may put students' reputation and confidence at risk. Furthermore, they argued that such issues should be paid special attention in the outer and expanding circles of academic settings (Kachru, 1985) where English is either second or foreign language (Groves & Mundt, 2021).

Harmoniously, in Turkey, a country in Kachru's expanding circle, Ata and Debreli (2021) asked 462 Turkish-speaking learners and 34 instructors from an English as the medium of instruction university to complete a questionnaire and report their GT use and perceptions in language learning. Although learners and instructors reported opposing views, the general trend was positive. In Saudi Arabia, another country in expanding circle, university students detailed their personal histories with GTA along with their extensive use of GT for educational purposes during the Corona pandemic. They found some of its features such as 'text image' translation practical and valued it as a convenient and necessary application on smartphones for language learning (Bin Dahmash, 2020).

PURPOSE OF THE STUDY

Following the above-mentioned literature, by knowing that EFL is extensively used in Iran; the country is located within Kachru's expanding circle and Iranian university students extensively use GT (Maghsoudi & Mirzaeian, 2020; Nasri et al., 2021), the researchers found it necessary to qualitatively explore this neglected issue to provide a deep understanding of Iranian student teachers' perceptions on the use of GT for language learning

in academic context. As a result, this SCT-oriented study used the following research questions to bridge this gap:

1. To what extent and for what reasons did Iranian student teachers use GT for language learning in higher education?
2. What were Iranian student teachers' perceptions toward the practicality of GT for language learning in higher education?
3. What were Iranian student teachers' perceptions toward legitimacy and ethicality of GT use for language learning in higher education? Should there be a university policy?

METHOD

Research Design in Grounded Theory

Glaser and Strauss (1967, p.1) defined 'grounded theory' as "the discovery of the theory from data systematically obtained and analyzed in social research." The data-driven essence of the inductive grounded theories increases researchers' awareness and provides guidance to take action (Strauss & Corbin, 1998, p.12). Besides, the well-structured concepts of this methodology provide an exhaustive theoretical panorama of the under-research topic (Corbin & Strauss, 1990). In fact, grounded theory is not only a rigorous and systematic scientific endeavor but an artistic and creative reciprocity between the researchers and data (Strauss & Corbin, 1998, p. 13). The distinctive properties of this approach provided supporting rationale for adopting this research design to explore Iranian student teachers' perceptions on the use of GT for language learning in academic context.

Participants

The participants of this study were 12 female student teachers who majored in CALL in a public university in Tehran. They were selected based on purposive sampling and voluntarily served as interviewees in this study.

Although diverse sampling techniques are employed in grounded theories, most of them prefer purposive sampling to provide the most relevant and rich data (Tie et al., 2019). Their age range was between 24-36 with the average of 28 years. Based on the respondents' self-reports, their proficiency level in English was intermediate and advanced. Regarding teaching background, they were teaching English at different levels in private institutes with the average of 6 years of work experience.

Instrumentation

Semi-structured Interviews: Following grounded theory protocols (Glaser & Strauss, 1967), a researcher conducted semi-structured interviews in Persian consisting of 26 questions (Appendix A). According to Gillham (2005), a semi-structured interview is a flexible method starting with preliminary and general questions such as 'Are you familiar with MT?' and the succeeding questions are elaborated based on the interviewees' responses to gather ample, rich and immediate data through which respondents' mental schemes concerning the under-question issue are fully clarified. To achieve the content validity of the interviews, an expert researcher, namely a CALL professor with more than 10 years of academic experience reviewed the interview questions. The interviews included items such as GT familiarity and use, learners' perceptions, professors' perceptions, and attitude toward GT workshops. The logic behind conducting interviews is that respondents and researchers co-develop the theory (Tie et al., 2019).

Audio Recording: Since audio recordings provide researchers with a literal account of the responses, they are more reliable than written notes (Ary et al., 2010, p. 439). One of the researchers having English teaching experience conducted in-person interviews and recorded them by using a smart phone. To address ethical concerns prior to data collection, the researchers sought consent from the university. Moreover, the interviewer tried to establish rapport with the participants to create a relaxing, friendly

and motivating atmosphere by providing an initial self-introduction and clarifying the aim of the study. She ensured the anonymity and confidentiality of the collected data and assigned the IDs of S1-S12 to the interviewees. The interviewees signed a consent form to confirm their voluntary and active participation along with agreeing to record the interviews. Since some of the participants' language proficiency was intermediate, in order to avoid speaking anxiety and ensure full comprehensibility of all the steps of data collection, they were all carried out in participants' native language. While interviewing, plenty of time was given to the participants to express their feelings and thoughts about each question without worrying about time constraints or any other factors. Meanwhile, the interviewer restated their accounts and asked for confirmation during interview sessions as member-checking to ensure the trustworthiness of the findings.

Data Collection Procedure

As mentioned above, semi-structured interviews were conducted to explore Iranian student teachers' perceptions on the use of GT for language learning in higher education (Dörnyei, 2007, p. 136). The interview sessions were held once a week between 10-31 May 2022 by one of the researchers. The main author verified each step of the data collection. Each interview lasted between 20-30 minutes. The researchers listened to the recorded data repeatedly and transcribed them carefully. Mapping onto the iterative and closely intertwined nature of qualitative data collection and analysis processes, data collection and analysis were conducted in three stages via theoretical sampling. Theoretical sampling has been best defined as "the process of data collection for generating theory whereby the analyst jointly collects, codes, and analyses his data and decides what data to collect next and where to find them, in order to develop his theory as it emerges" (Glaser and Strauss, 1967, p. 45)

Data Analysis

The initial stage included individual face-to-face data collection, open and axial codings, memoing, and constantly comparing the codes extracted from each interview to come up with the core category. Once the core category was produced, further data collection, and selective coding accompanied by memoing and constant comparison of the codes were pursued to reach theoretical saturation (Corbin & Strauss, 1990). Theoretical saturation is a point at which no new views are generated concerning a specific category (i.e., core category) through further data collection and analysis (Strauss & Corbin, 1998, p. 143). Finally, the literature was more extensively reviewed to seek the associations of the literature with the developing theory. Simultaneously, the memoed categories were sorted to determine their links to the core category which in turn led to the construction of the data-driven theory.

Simultaneous and systematic data collection and analysis of the authentic textual data in grounded theory method vividly elaborate on the verbatim accounts and portray the extraction and creation of the emergent theory. Applying grounded theory principles, the audio-recorded interviews were transcribed and translated into English. Gradual data trimming and conceptualization were managed through the stages of open, axial and selective data coding accompanied by memo-writing and employing constant comparative method of analysis (Ary et al., 2010, p. 464).

The core category was identified through open and axial coding processes. This concept is one of the transient categories that has the potential to provide a thorough account for the data and establish natural and purposeful connections with other categories (Glaser, 1978, p. 90). We defined the core category as: *implementation of GT in language learning.* By having the core category and its close-knit concepts in mind, in the selective coding stage, we continued further data collection and analysis around them until we reached theoretical saturation. Note that, other stages of interviews were carried out online through a social networking group. Ultimately, providing an outline of the connected categories through

theoretical coding led us to compose the theory of GT use in language learning.

The hallmark of the grounded theory approach is the development of a quality theory. To do so researchers have to enhance theoretical sensitivity which is the ability to identify crucial data relevant to the theory (Strauss & Corbin, 1998, p. 209). In other words, while staying open-minded, the researchers immerse in the data to distinguish significant theoretical concepts relevant to the theory to increase sensitivity necessary for theory construction (Tie et al., 2019).

RESULTS

In response to the research questions, the qualitative grounded theory methodology was applied. The transcribed and translated interview recordings were saved in Google Drive. The reliability of coding processes was judged by two experts and disagreements were resolved by consulting a third expert. Nine categories were coded including *GT familiarity, GT use, student teachers' perceptions, post GT editing, professors' perceptions, GT workshop, policy making, ethicality, and GT substitution* and the core category of *implementation of GT in language learning* was identified through the open and axial coding processes. Figure 1 presents the research model.
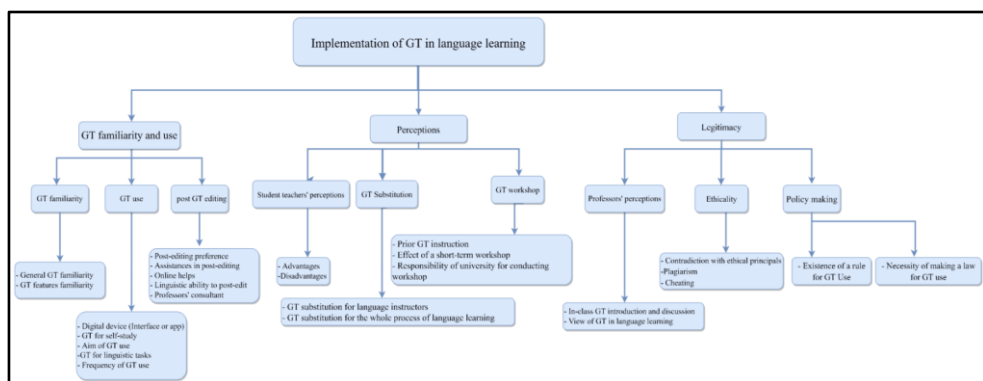

Figure 1: the research model

Responses to Research Questions

1. To what extent and for what reasons did Iranian student teachers use GT for language learning in higher education?

GT has been a source of controversy in language education (Carré et al., 2022, p. 187). Learners, however, widely consult this service for educational purposes (Groves & Mundt, 2021). Regarding the first research question, as S6 confirmed the ubiquity of GT in Iran, all of the interviewees were familiar with GT; however, they preferred using its web interface over the GT app (GTA). Most of them (n = 8) used GT for language learning. While only two used it in online classes, the rest tried it out of class due to objections.

One of the main points discussed in the interviews was their familiarity with GT features. The participants enumerated a few features such as selecting and swapping between languages, translating voice and text, and voice output. Note that voice output is not available for Persian. Not surprisingly, such a small acquaintance with features confined the application of GT and gave rise to unfair judgements concerning its practicality. Accordingly, they mentioned a number of that tasks they performed with GT: a) translating words and sentences from English to Persian and vice versa, b) translating and post-editing field-specific or complex texts which either they were unable to translate or was time-consuming to be translated by themselves, c) translating texts for reading comprehension, d) checking pronunciation and part of speech.

It seems that as GT provides verbatim translations, some learners preferred to use it for looking up words to render complete sentences. They did not fully trust it and checked the outputs with other websites. Moreover, the frequency of GT use, as they reported, mirrored their incognizance of this technology. Rarely did the interviewees use GT weekly. A few (n = 4) used GT most weekdays.

Two interviewees mentioned that using GT for language learning had never come to their minds until they read our recent publication

(Mirzaeian & Oskoui, 2022). It changed their opinions about GT and made them curious about it. Now, they started thinking about this novelty. One of them thought that she only had to use pictures or synonyms to learn a new word; but now, she thought about this new alternative. Three respondents who worked as translators, did not use GT for language learning either. S1 found equivalents suggested by GT useful for translation. S5 stated that if she got acquainted with it and wanted to try it for language learning, she would take it as a self-study tool for pronunciation check and vocabulary learning.

Concerning the relationship between language proficiency and GT use, S11 illustrated that as her proficiency improved and she found more errors in the outputs, she reduced using GT. In contrast, S3 used GT but did not recommend it to her students. Moreover, the interviewees found GT a practical help for independent language learning (ILL). Based on what S7 pointed out, her students widely used GT. She thought of GT as a useful tool if accompanied by a thorough software instruction, depending on the context of use, the task type, and the learner characteristics.

Generally, the participants believed that since the instructors were not always available, GT could be a highly practical substitute to translate sentences, learn correct pronunciations, compose a paragraph, and comprehend texts. Nevertheless, despite the facilitating role of GT, they did not recommend it as the only source of reference because of the inaccuracies appearing in its outputs. S2 maintained:

> *Language learners should only make limited use of GT for writing and grammatical problem-solving. Instead, they are better to use their own minds to internalize the language. As an instructor, I suggest employing GT to intermediate level students or above but make them aware of the strong and weak points of the service and teach them how to work with it.*

The participants considered post GT editing necessary and did it either themselves or sought information and advice from friends, the Internet, online dictionaries (e.g., Abadis, Grammarly, Wikipedia, and paraphrasing websites), and their professors. Yet, none of them had experienced GT's 'Contribute' option.

2. What were Iranian student teachers' perceptions toward the practicality of GT for language learning in higher education?

According to Tsai (2019), integrating GT in language learning is a learner-centered approach. In fact, the overall attitude of software users, namely, learners reflect the practicality of MT not the software itself (Levy, 2009). When participants were asked whether they were satisfied with GT performance, they responded quite positively. S1 found GT a handy tool suggesting appropriate equivalents for words when there was not enough presence of mind to instantly remember synonyms. A number of views concerning the relationship between language proficiency and GT practicality also is worth mentioning. S2 and S6 harmonious believed GT was useful for competent end users (Intermediate and above) who were able to edit the outputs; however, they did not recommend inattentive use of it to their students.

The data showed that GT helped the participants in translating simple texts and editing. They believed that writing was the only skill that GT could be applied to. To magnify the positives and negative points regarding GT, S2 creatively defined it as a double-edged sword, i.e., a great unreliable assistant. It could be inferred from the interviewees' responses that, GT, despite the flaws, was a user-friendly and time-saving language learning facilitator compatible with diverse systems. This free and convenient service was not limited to trial or premium versions.

As it supported a wide range of languages, majority of the language learners worldwide were able to employ it for writing, pronunciation check, immediate translation, simple sentences, getting instant equivalents,

assignment completion, and acquiring content through translation. Besides, its instant feedback provided a chance for learners' self-evaluation. For instructors, it was a good idea to teach abstract concepts via Persian translations. Note that making conscious use of GT is the key to practical and productive application of this novelty.

In contrast, the participants recounted downsides of GT. Essentially, the extent to which learners relied on it determined the consequent appraisal of its performance. In case of a translation task, for instance, it seemed undesirable for learners to bank on the software and deliver the output as it was, rather than converting the text themselves and double-checking it with GT. This scenario might have been troublesome due to the inaccuracies of the renditions, especially for learners who were unable to differentiate between correct and incorrect sentences. In general, GT training was of crucial importance. Accordingly, accessibility of what learners needed lead to the over-utilization of this service which in turn made them lazy. At the same time, S7 was in the opinion that when something could be done with software, there was no need to do it themselves.

With regard to the replacement of a language instructor with GT, all the interviewees agreed that this was absolutely impossible. S7 and S9 believed that machines with their erroneous outputs were not sophisticated and intelligent enough to substitute a human instructor. GT only translated and was unable to teach language skills. Relating GT to the obsolete 'grammar translation' method, S10 recommended not teaching with translation. Some of the interviewees stated that although GT could be used as the sole reference and learners could take advantage of other tools such as corpora (e.g., COCA), it could be a good assistant as a source of authentic material for learners at intermediate level or above (S5, S1). Besides, for a more rule-governed and effective use of GT, learners' styles had to be taken into account (S2).

Mentioning the qualities of a human instructor, on the other hand, S8 and S12 claimed that an instructor was able to identify learners' needs and fulfill them by teaching necessary aspects of a language and providing

corrective feedback and guidance. In total, as S9 stated, neither an instructor was a translator, nor a software was an instructor. Another main point to emerge from this study, which the participants unanimously disagreed with, was the replacement of the whole process of language learning by GT. S10 and S11discussed that language learning was not merely vocabulary learning or translation. These were only two aspects of this complex process. Machines were unable to serve as sources of the essential input for language acquisition and they could only help as part of a class or acquisition process. Moreover, S2 believed that although communication was the most important application of a language, individual contacts and socializations, even limited or at times with mistakes, were more appreciated than pure machine communications.

As Fredholm (2015) maintained, GT per se did not lead to linguistic improvements but learners' language proficiency accompanied by their digital literacy contributed to software efficacy. Accordingly, we asked the interviewees whether they had received any special training to use GT. None of them had participated in any course or workshop in this regard. Most of them (n = 10 out of 12) found the idea of conducting a short-term GT workshop at university a momentous chance to get acquainted with this service, especially for CALL students. However, S7 considered GT to be a simple software that could be learned via YouTube. In addition, S6 had a feeling that a workshop with a wider focus on online dictionaries, or translation engines would be more fruitful than the one confined to GT.

As they trusted the university, they preferred to take part in workshops held by their educational setting. S6 suggested that her university might suggest CALL students to organize workshops for different applications as course projects so that they mastered that piece of technology. Congruently, S8 believed that holding a workshop to introduce its facilities and features to both university students and the professors who did not know how GT worked was appreciated.

3. What were Iranian student teachers' perceptions toward legitimacy and ethicality of GT use for language learning in higher education? Should there be a university policy?

From the collected data, it was concluded that there was a general negative view of GT among the professors and most of them did not explicitly discuss GT in class. This is not to say that they totally disconfirmed its application due to the inaccuracies but an aware and cautious use of this assistant accompanied by post-editing was recommended.

One key issue in this area was the implementation and enforcement of a law on the use of GT in higher education. All of the respondents concurred with the absence of law in this respect. Nonetheless, they expressed opposing views concerning the necessity of enactment of a policy. A number of them (n = 6) maintained that passing a law, in fact, did not mean to condemn GT use; but to clarify '5Ws', namely who, when, where, how, and to what extent was reasonable to employ GT in linguistic practices to avoid misleading or software abuses.

Alternatively, the rest of the respondents (n = 6) stated that whether to use GT or not, was a personal decision and more importantly, the hypothesized law would not be employed, with no executive guarantee. What mattered most as GT literacy. Likewise, neither did they consider GT use as plagiarism nor did they view it as cheating, excluding some exceptional cases such as in reading comprehension or publishing the GT outputs under their own names. To support this idea, S4 pointed out:

GT is similar to Grammarly. Our professors themselves introduce Grammarly and suggest its use to us and recommend that it be introduced to high-level learners, not low-level ones, which may cause laziness and lack of learning. So, when Grammarly is accepted, why not GT?

DISCUSSION

This section is divided into three sub-sections based on the research questions.

GT Familiarity and Use

The analysis of the data showed that the participants were familiar with GT and most of them used it for their language-based activities. This finding agrees with a number of earlier studies (e.g., Alhaisoni & Alhaysony, 2017; Clifford et al., 2013; Kumar, 2012). In addition, the participants supported the efficacy of GT for autonomous practices which was a clear convergence with the associated literature (Nino, 2020; van Lieshout & Cardoso, 2022). Despite the participants' general acquaintance with GT, they were only familiar with a few features and had made restricted use of it as a result of lack of knowledge about this novelty. In analogy, in Bin Dahmash's (2020) study, the participants used GT app (GTA) on their smartphones and discussed using 'handwriting', 'voice', 'conversation', 'definition', 'do you mean' and 'camera' features for both language learning and everyday life.

As it is the case, it seems that developing GT literacy to efficiently implement GT in language education is essential. This claim is confirmed by recent investigations (Groves & Mundt, 2021; Urlaub & Dessein, 2022; Zhang & Torres-Hostench, 2022) which supported the idea of the imperativeness of enhancing GT literacy. Following Jones (2017), we defined the concept of GT literacy as: "The literacy practices individuals engage in implementing GT in language education and daily activities".

Another noteworthy finding of this study was concerned with the relationship between language proficiency and GT use. This argument has been the focus of MT scholars since the early 2000s (Nino, 2008, 2009; Xu, 2022). While scholars such as Garcia and Pena (2011), and Lee (2021) documented the efficacy of GT for low-level learners, others (e.g., Enkin & Mejias-Bikandi, 2016; Kol et al., 2018) backed up the opposing impressions. Consistently, our findings confirmed the ever-existing contrary

views on the practicality of GT for both low- and high- level learners. Remind that, as GT renditions are not exempt of flaws (Chang, 2022; Chung, 2020; Mirzaeian, 2021), evaluating the accuracy of the outputs is of crucial importance. Echoing the previous research, our participants found post-edited texts either themselves or by consulting their friends, professors, the Internet or online dictionaries. Drawing on the relationship between language proficiency and error correction, Lee and Briggs (2021) concluded that while low-level learners focused on correcting less cognitively demanding errors such as articles and prepositions, high-level students engaged in critical evaluation of GT output and dealt with more complex inaccuracies. Another considerable finding of their study, consistent with Lee (2014), tapped into learners' lack of confidence, especially among low-level ones, in adopting the correct alternatives proposed by GT in their revisions.

Student Teachers' Perceptions Toward GT Practicality

As mentioned in the 'review of the literature' section, since the 1990s, scholars have affirmed the practicality of MT in language learning (Anderson, 1995; Parsons, 1996). This trend continued and succeeding investigations (Alhaisoni & Alhaysony, 2017; Briggs, 2018; Mundt & Groves, 2016; Tsai, 2019, 2022) revealed language learners' positive attitudes towards GT use. Accordingly, our respondents held plausible standpoints of GT use despite their awareness of the pros and cons of this service. Nevertheless, they concertedly expressed that replacing a language instructor or the entire language learning process with GT was far-fetched. Despite the fact that AI-based GT output outperforms human translators at times (Maghsoudi & Mirzaeian, 2020; Murphy Odo, 2020), Lee and Briggs (2021) emphasized that GT should not be deemed as a language teacher or a substitute for language education.

In the digital age, digital language learning and teaching (Carrier et al., 2017, p. 1), urges digital language learners and instructors to be digital

literates. Most recent MT studies have emphasized that the key to an effective and practical implementation of GT in language learning is GT literacy (Knowles, 2022; Mirzaeian, 2022; Zhang & Torres-Hostench, 2022). Bowker (2020) reported an experience with Chinese language learners at Concordia University. Participants took part in a GT ad hoc workshop to learn tips on writing effectively in English. Although this workshop was welcomed and considered as a success, it was recommended to design more language-specific and detailed workshops to enhance learners' knowledge on issues such as pre- and post-editing. In keeping with the above-mentioned studies, our respondents clearly maintained that it was essential for both university students and the professors to be GT literate. Indeed, GT illiteracy made a sense of alienation with the software which consequently gave rise to unfair judgements and decisions concerning GT use on the part of language learners and teachers.

Legitimacy and Ethicality of GT Use for Language Learning

GT is one of the state-of-the-art technologies that has attracted particular attention in higher education (Groves & Mundt, 2015). Nonetheless, this ubiquity raises diverse concerns in terms of academic integrity. There has always been tension in this regard. Chandrasoma et al. (2004) believed that in some cases, intertextuality is not violating the academic ethics. In a similar vein, research claimed that copy/paste plagiarism, for some university students, is essential to become expert academic writers (Ivanic, 1998; pecorari, 2003, as cited in Groves & Mundt, 2021).

From the findings of this study, we concluded that the professors were not inherently opposed to the use of GT by the students. Indeed, their main concern was to present flawed linguistic contents to the students which might bring about misunderstandings. On the other hand, as the learners did not view GT use academic dishonesty, to prevent such probable consequences, they were inclined to issue a logical, serviceable, and

constructive GT instruction to exploit this emergent technology for the benefit of all those involved in language teaching and learning.

CONCLUSION AND IMPLICATIONS

The aim of this study was to explore the level of familiarity and use of GT by Iranian student teachers, their perceptions of the practicality of GT, as well as its legitimacy. Employing a grounded theory approach, the researchers interviewed Iranian student teachers who majored in CALL in a state university to propose a model of GT use in language learning, entitled 'Google Translate-Assisted Language Learning (GTALL). Three main categories were discussed in this regard: 1) GT familiarity and use, 2) perceptions, 3) legitimacy. Collectively, the three main categories and 35 sub-categories at two levels supported our core category 'implementation of GT in language learning.'

The findings of the qualitative analysis confirmed that student teachers acknowledged the ubiquity and efficacy of GT in enhancing language learning either as a self-study facilitator, in online courses or to complete assignments out of class. They were aware of the strengths and weaknesses of this service and mostly found post GT editing necessary. Unfortunately, they were not competent enough to fully take advantage of its available features and appreciated conducting a short-term workshop to get more information about how it worked. Although no official regulations had ever been enacted to act upon, they saw GT use a legitimate educational practice. Above all, they were of the opinion that it was unlikely that a language instructor or the process of language learning would be replaced by GT someday. The professors, however, were doubtful about this story due to the shortcomings of GT. Admittedly, their main concern was the probable misunderstandings that might arise as the result of exposure to erroneous GT drafts.

This study proposed clear implications for professors and learners. To move in line with the technological revolutions in the realm of language

education, it is advisable for the professors to get more acquaintance with innovations to make more research-based decisions. As far as GT is concerned, they need to be mindful that learners have accepted and used GT. Instead of futile objections, they should encourage productive and responsible use of this novelty. To do so, it is preferred to make the positive and negative aspects of this tool clear, especially for low-skilled learners and teach them critical use of it. They should advise language learners to plan based on their needs and develop authentic GT practices. In return, learners should improve their language proficiency to incorporate GT reasonably in their practices instead of totally relying on it.

A number of limitations of this study and suggestions for future research should also be considered. First, this study was conducted in higher education. Investigating language learners' perceptions at different age ranges and with different language proficiencies in other educational contexts is essential. Second, the participants studied CALL and were either intermediate or advanced English language learners. Future studies should sample university students from other fields of study who are less proficient in English to better understand the part GT plays in academic context. Third, the interviewees did not evaluate GT practicality when dealing with specific academic texts including theses and dissertations. Given the ubiquity of GT, it is not unlikely that university students from different fields of study consult this service while working on academic texts. It seems essential to explore this issue to get a better understanding of the role GT plays in academic endeavors. Fourth, we have only found the opportunity to interview student teachers. Considering the conflicting views of the professors and the learners, interviewing the professors elucidates their mindset. Finally, semi-structured interviews were the only data collection method. Future studies may prefer to focus group discussions, think-aloud protocols, and stimulated recall interviews to gain a deeper understanding of the occurring interactions between learners and GT.

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Appendix A

Interview Questions

Student teacher:
Age ……
Field of study ………
Degree ………...
Language Proficiency.………

1. Are you familiar with Google Translate (GT)?
2. Do you use it for language learning?
3. For what learning purposes (skills) do you use it? Please explain.
4. Which digital devices do you use GT on (application, website, or both)?
5. Which GT features are you familiar with? For what purposes do you use them?
6. How many times per week do you use it?
7. Are you satisfied with its performance? Please explain.
8. What do you think about using GT in independent language learning (ILL)? Can the use of GT give independence to language learners? How?
9. What if you see a problem in the output of GT? Do you try to edit it?
10. Are you familiar with the 'contribute' option?
11. Based on your experiences in error corrections, do you have the required language proficiency to post-edit texts?
12. If not, do you consult your instructors, classmates, relatives or the Internet for post-editing?
13. What search engines, websites or applications do you use for help?
14. Do you consult your professors?
15. Do the professors give positive or negative opinions about your use of GT in language learning?

16. Do the professors talk about using GT in class? Do they approve or disapprove its use?
17. Have you received any special training regarding the use of GT?
18. Does conducting a short-term workshop to learn how to work with GT have an impact on your better use of it in language learning? How?
19. Do your professors or your university have to conduct a training workshop for their professors and students?
20. What are the advantages of using GT in learning languages?
21. What are the disadvantages of using GT in learning languages?
22. Is there a specific rule in your university regarding the use of GT in or out of class?
23. Do you think there is a need to pass a law in this regard? Please explain.
24. Does the use of GT in language learning contradict ethical principles, such as plagiarism or cheating? Please explain.
25. Can GT be substituted for a language instructor? Why or why not?
26. Can GT be substituted for the whole process of language learning? Why or why not?