

The Effect of Using DeepL on Improving Students' Writing Vocabulary

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Abstract: As artificial intelligence technologies increasingly integrate into education, neural translation machines, such as Google Translate and DeepL, are gradually becoming an important tool for enhancing the effectiveness of foreign language learning. These technologies not only improve the efficiency of the learning experience but also address the limitations of traditional vocabulary acquisition methods. While research has examined DeepL's translation quality, there is limited focus on Spanish learners' attitudes and experiences with DeepL during the writing process, particularly regarding its impact on vocabulary enhancement and student feedback. This paper aims to investigate Chinese university students' perceptions of using DeepL to improve their Spanish writing vocabulary. The method used in this research was a descriptive quantitative technique. 60 undergraduate Spanish students completed a questionnaire. The results of this research showed that, Chinese undergraduate Spanish language students believe that the use of DeepL has a good effect on improving their writing vocabulary in general, but there are still some problems of the accuracy. Another conclusion worth emphasizing is that the use of DeepL to enrich the vocabulary of articles does not have a direct and strong connection with the improvement of the user's own vocabulary.

Keywords: DeepL translator, Student perception, Spanish, Translation.

1. Introduction

Learning a second language necessitates a sufficient vocabulary, and writing could be regarded as a form of production. Vocabulary plays an important role in writing and enables students to use language positively [1]. Vocabulary diversity is an important indicator of second language writing development and achievement. The importance of vocabulary for writing is obvious. However, writers often struggle with limited vocabulary or only partially learned vocabulary [2]. Bowker gathered numerous examples of students using Machine Translation (MT) to assist with academic writing [3]. Language learners frequently employ AI-powered MT to address vocabulary gaps, correct grammatical errors, and provide quick translations.

AI-powered tools and technologies have significantly contributed to various fields, from natural language processing to computer vision and machine learning [4]. Advancements in AI and Natural Language Processing have significantly enhanced the capabilities of language and writing tools [5]. Digital tools like online dictionaries, spell and grammar checkers, and search engines are now

standard and assist in the writing process. Although MT was not originally developed for educational purposes, it has been adopted by many students who write in foreign languages [6]. AI-driven writing tools for text translation include Google Translate, DeepL, Duden-Mentor for improved spelling, Hemingway App for text analysis, and Quillbot for rewriting and summarizing. These tools offer quick and detailed suggestions for adjusting text elements [7].

DeepL is a new machine translation engine launched in August 2017. It automatically translates between two languages using deep learning and NMT technology [8]. DeepL offers a range of functions, including translation of text, documents, and web pages and a translation API for developers. DeepL's translation technology is based on deep learning algorithms, allowing the tool to analyze the meaning and context of words and phrases to provide more accurate translations [4]. DeepL is considered more accurate than Google Translate. Compared to many other translation tools, DeepL stands out for its ability to provide more accurate and natural translations [9]. The study shows that DeepL demonstrates its higher translation quality in the translation of multiword expressions compared to Google Translate [10]. It has been demonstrated that DeepL excels in detecting and establishing high normalized frequencies of Spanish idioms and their noun variants in continuous and discontinuous forms [11]. It is evident that the high-quality translations of DeepL are somewhat recognized and confirmed.

2. Literature review

It is necessary to understand students' perceptions of Machine Translators, including how they use them, the challenges they face, and their long-term effects. Previous studies have explored attitudes towards translation machines. "Students have different attitudes towards AI-powered writing tools, and personalized teaching strategies may help to promote or urge critical use of these tools." [12]. It has been shown by research that students recognize DeepL as an important translation tool but remain doubtful about its translation results [13]. A similar finding was found in a study on Google Translate, where nearly all students agreed they needed to recheck the translation results [14]. "English as a Foreign Language (EFL) students must recheck and rearrange words, phrases, texts, and passages when translating them in order to get a good translation based on their understanding." [15]. A study of Saudi Arabia and South Korea students showed that students accepted positively and used translators. Even the errors in the translation results draw the learners' attention to improving these collocations and grammatical patterns [16]. "Google Translate can be a useful tool for English for Academic Purposes students, who have improved their vocabulary of texts, but only if they are able to critically evaluate and correct the output." [6]. A study investigating the impact of DeepL on EFL students' writing indicates that the use of DeepL translators positively improves the quality of students' writing in academic environments. Although DeepL improved the quality of their writing, it is still important to check the translations. When students notice differences between their original text and the DeepL translation, they carefully review it and use their knowledge to revise it. This approach not only improves the quality of their writing but also encourages them to think more critically about the revised version. Therefore, students can improve the quality of their writing by using DeepL as a revision tool. This tool should be viewed as a complement, not a replacement [17]. One study responds to the question of whether the use of a translator improves Spanish learners' own vocabulary levels: it is not taken for granted that the use of Google Translate will improve students' language learning. Google Translate can motivate lower language learners to write, but the application will unlikely improve students' vocabulary learning [18]. Another study by this researcher makes the fact clearer: using Google Translate does seem to help language learners write texts with a more diverse vocabulary. However, compared to using a dictionary, using Google Translate does not seem to help language learners acquire a more diverse vocabulary over time [19].

Based on the above findings, this study wanted to determine students' perceptions of using DeepL to improve their writing. As a result, the primary question is: What are students' perceptions of using DeepL to improve their writing vocabulary? The derived question is: How do students perceive the improvement of vocabulary in writing to affect them? Considering the lack of research on this topic, this study is innovative.

3. Method

This study aimed to explore the perceptions of Chinese undergraduate Spanish students' perceptions regarding using DeepL to enhance their Spanish writing vocabulary. The method used in this research was the Descriptive-Qualitative method. Data were collected through a questionnaire posted on the "Questionnaire Star" platform. The questionnaire title was: Survey on Chinese Undergraduate Spanish Students' Perceptions of Using DeepL to Improve Their Writing Vocabulary." The questionnaire's structure and format were adapted from [14], with additional modifications. The questionnaire shifted from translation to vocabulary, emphasizing alternative words specific to the DeepL translator and exploring students' perceptions of this feature and its effect on them. Additionally, six questions were added to summarize the shortcomings of the DeepL translator identified by students in the open-ended section of Yanti & Meka's study [14]. The questionnaire used a Likert scale, with responses divided into two categories: yes and no. The questionnaire comprised 30 closed-ended questions across five categories. The first category included three questions for general information about students' use of the AI translator. The second category had four questions assessing students' basic vocabulary knowledge. The third category focused on students' perceptions of using DeepL with 11 questions. The fourth category explored students' views of DeepL as a media, comprising nine questions. The fifth category addressed the disadvantages and challenges associated with using DeepL, consisting of 6 questions.

The research subject was 60 students, comprising 39 Spanish majors from the Macau University of Science and Technology and 21 Spanish undergraduates from various universities in Mainland China. Their ages mostly ranged from 18 to 22 years. Questionnaires were distributed over one week via the online platform "Questionnaire Star." After collecting the data, the researcher analyzed it using the Descriptive-Qualitative method.

4. Findings

The data in this research was derived from the results of a questionnaire filled out by the students. The aim is to assess students' opinions on using DeepL to enhance vocabulary in Spanish writing and the challenges they encountered in using it. Therefore, the results can be found in this section. Below is the content of the five categories of questionnaires and the descriptive results of each questionnaire.

Table 1: General Information

| QUESTIONS | YES | NO |
|---|--------|--------|
| Do you like writing in Spanish? | 66.67% | 33.33% |
| Do you use DeepL for Chinese-Spanish translation? | 100% | 0% |
| Do you use other translators for Chinese-Spanish translation? | 91.67% | 8.33% |

The three questions in Table 1 gather general information about the research subjects' views on writing in Spanish and using translators. Table 1 indicates that 40 students enjoy Spanish and writing, while 20 do not. Notably, all 60 students have used DeepL for Chinese-Spanish translation, according to which it can be understood that DeepL is a more widely used translation tool among Chinese undergraduates of Spanish. More than 91% of students utilize other translators, with only five students exclusively relying on DeepL for Chinese-Spanish translation.

There are three indicators in Part 2 of the questionnaire: 1. Writing, 2. Vocabulary, and 3. Using the DeepL Translator for Writing Assistance. The table below presents students' responses to these indicators.

Table 2: Students' Vocabulary Basic Knowledge

| NO | STATEMENT | YES | NO |
|----|--|--------|--------|
| 1 | I often do Spanish writing | 61.67% | 38.33% |
| 2 | I find it difficult to write in Spanish with my current vocabulary | 56.67% | 43.33% |
| 3 | I use a translator when writing in Spanish | 100% | 0% |
| 4 | I use DeepL as a writing support to improve the vocabulary of my texts | 81.67% | 18.33% |

Table 2 reflects the basic vocabulary knowledge of the study participants. Over 61% of the students practised Spanish writing regularly, while around 38% practised Spanish writing infrequently. More than half of the students felt that they had some difficulty with Spanish writing with their current level of vocabulary, while still about 43% of the students did not think that they had much difficulty. Regarding the third statement, all students used a translator in their writing. It demonstrates that using translators is a common behavior among Spanish undergraduate students. The fourth statement shows that more than 81% of the students acknowledged that DeepL can be used as a writing tool to improve the vocabulary of their essays, while about 18% disagreed.

The third part of the questionnaire mainly reflects the results of students' perceptions of using DeepL. Statements 11, 12, and 13 were adapted from the original questionnaire, and students' writing habits with DeepL were assessed in terms of individual words, sentences, and paragraphs. Statements 14 and 15 investigated students' dependence on using DeepL.

Table 3: The Result of the Students' Perception about the Use of DeepL

| NO | STATEMENT | YES | NO |
|----|--|--------|--------|
| 5 | I have DeepL application in my gadget | 68.33% | 31.67% |
| 6 | I could write easier using DeepL as a media | 83.33% | 16.67% |
| 7 | DeepL is helpful for improving my vocabulary | 33.33% | 66.67% |
| 8 | DeepL could be a good media for Spanish writing | 90% | 10% |
| 9 | DeepL can improve the vocabulary of my articles efficiently | 73.33% | 26.67% |
| 10 | The alternative words provided by DeepL have the correct meaning in the dictionary | 50% | 50% |

Table 3: (continued).

| | | | |
|----|--|--------|--------|
| 11 | I use DeepL to enrich the diversity of individual words | 70% | 30% |
| 12 | I use DeepL to enrich the diversity of sentence forms | 56.67% | 43.33% |
| 13 | I use DeepL to translate entire paragraphs | 53.33% | 46.67% |
| 14 | I could not improve the vocabulary of my writing without using DeepL | 16.67% | 83.33% |
| 15 | DeepL makes me lazy open the dictionary | 53.33% | 46.67% |

Table 3 reveals that nearly 69% of students have the DeepL application installed on their devices, while approximately 32% do not. From statement 6, it can be concluded that most students think that using DeepL as media can make writing easier, although ten students disagree. Statement 7 indicates that about 67% of students do not think DeepL can enhance their vocabulary skills, whereas around 34% believe it does. Of 60 students, 54 consider DeepL a useful writing tool, while six do not. Interestingly, statement 9 contrasts with statement 7, showing that most students feel DeepL can improve the vocabulary used in their writing but not their personal vocabulary. Statement 10 related to the function of DeepL to provide alternative vocabulary. Half of the students doubted the accuracy of the synonyms provided, while the other half trusted DeepL's suggestions. It can be seen that people remain doubtful about the accuracy of the alternative vocabulary despite the wide range of people who use it. This is likely due to potential deficiencies in the AI's analysis stemming from sentence meaning and context variations. "The deeper the underlying meaning and connotation in the text, the more complex and nuanced it is, leading to greater difficulties for Machine Translation." [20]. The results of Statement 11 reflect that 70% of the students choose the alternative words provided by DeepL to enrich the linguistic diversity of individual words while 30% do not. Slightly more than half of the students used DeepL to enhance the diversity of sentences in their writing and used DeepL to translate entire paragraphs. Statement 14 indicates that most students acknowledged the function of DeepL to improve the article's vocabulary, which is in concert with the results of statement 9. Similarly, they all admitted to the dependency of using DeepL and that it was difficult to improve the vocabulary of the articles without applying this tool. There are still 10% of students who hold an opposing view. The instant translation feature enables quick access to the corresponding Spanish word after entering a Chinese word, making it efficient and convenient. Slightly over half of the students admitted to being too lazy to open a dictionary, whereas about 46% still maintain the habit of looking up words after using the application. A prominent trend in students' perception can be summarized in Table 3. Most of the students confirmed that DeepL is a helpful learning tool, but it does not enhance their own vocabulary skills by improving the vocabulary of the articles. At the same time, there are still doubts about the precision of the alternative vocabulary presented.

Part 4 of the questionnaire questioned the students' opinion of DeepL as a Media from two perspectives. The first perspective is whether the result of DeepL enriching the vocabulary of the articles was satisfactory to the students (statements 16-19, 22-23). Translation machines have long been used by language learners, but until now, the value of these Neural Machine Translation Tools as learning tools has been limited by the accuracy of their outputs [21]. Therefore, statements about the accuracy of the translation results are set out in the table. The second perspective shows whether students perceived that the use of DeepL had some positive impact on their own vocabulary. This responds to statements 7 and 9 in Table 3.

Table 4: DeepL as a Media

| NO | STATEMENT | YES | NO |
|----|---|--------|--------|
| 16 | DeepL offers more alternative vocabulary than other translators | 75% | 25% |
| 17 | I am satisfied with the effect of DeepL in enriching the diversity of individual words | 66.67% | 33.33% |
| 18 | DeepL can enrich the diversity of sentences very well | 76.67% | 23.33% |
| 19 | I am satisfied with the results of DeepL for the diversity of whole paragraph translation | 65% | 35% |
| 20 | DeepL actually improves my own vocabulary | 48.33% | 51.67% |
| 21 | Compared to other ways of improving my own vocabulary such as memorizing words and doing reading, I like to expand my vocabulary by using DeepL to improve my writing | 33.33% | 66.67% |
| 22 | I believe that my writing is better after DeepL improves my vocabulary compared to former one | 75% | 25% |
| 23 | Before I finish a piece of writing, I will use other software or have someone else check the vocabulary of the improved article on DeepL to ensure if it is appropriate | 66.67% | 33.33% |
| 24 | Using DeepL has improved my vocabulary for writing and has given me more confidence in writing in the future | 43.33% | 56.67% |

The results from statements 16-19 in Table 4 reveal students' opinions on the help provided by DeepL. Most students believe DeepL outperforms other translators in vocabulary expansion, indicating a preference among undergraduate Spanish students. Meanwhile, 25% of the students still held a negative attitude. More than 65% of students agreed that DeepL significantly enhances vocabulary regarding words, sentences, and paragraphs. Slightly more than half of the students said no. However, the results of statement 21 reflect that more than 66% of the students are willing to take inspiration from DeepL, improving article vocabulary as a new way to improve their own vocabulary. 33% of the students do not think it is a good method. Statement 22 indicates that 75% of students are satisfied with the articles improved by DeepL, affirming the application's usefulness. Statement 24 shows that just over half believe using DeepL does not boost their confidence in independent writing.

The possible drawbacks and difficulties in using DeepL are summarized in six questions displayed in Table 5. The questions were informed by the results of student feedback from open-ended questions in Yanti and Meka's study [14], and the results of Burkhard's study [12] of students' doubt about using writing tools. The purpose of Table 5 is to clarify whether Chinese students also encountered these problems in the process of using the program.

Table 5: Possible DeepL difficulties and negative effects

| NO | STATEMENT | YES | NO |
|----|--|--------|--------|
| 25 | I often doubt about the accuracy of the meanings of the alternatives provided by DeepL (i.e. proper using / grammatically correct in the sentence) | 73.33% | 26.67% |

Table 5: (continued).

| | | | |
|----|--|--------|--------|
| 26 | I often find the words provided by DeepL do not match the original Chinese meaning | 20% | 80% |
| 27 | DeepL makes me memorize the wrong meaning of words | 36.67% | 63.33% |
| 28 | After using DeepL, I find it is difficult for me to associate words other than those provided by DeepL in my independent writing | 61.67% | 38.33% |
| 29 | I think using DeepL will reduce my vocabulary in the long run | 60% | 40% |
| 30 | I find it troublesome to have to use DeepL in an internet environment | 61.67% | 38.33% |

Table 5 explores whether Chinese students experience the same issues with DeepL as other students in the former research. Statement 25 revealed that most students doubted the accuracy of substitutable words. Following this, 80% reported that the Spanish generated by DeepL often did not match with the Chinese words. Conversely, statement 27 indicated that over 63% of students felt DeepL did not mislead them in memorizing words. Approximately 36% experienced negative effects from DeepL's inaccuracies, and more than 61% believed it made it harder to associate words beyond the replacements during independent writing. In the long run, 60% of students foresee a negative impact of DeepL on their vocabulary development. Additionally, over 61% in statement, 30 found the requirement of internet access for DeepL annoying.

5. Discussion and Conclusion

Based on the description of the findings, the following conclusion can be drawn: Chinese undergraduate Spanish language students believe that the use of DeepL has a good effect on improving their writing vocabulary in general, but there are still some problems with the accuracy. Students actively questioning the results of the translator is a great phenomenon for language learners. Although it is certain that DeepL is widely used among Chinese undergraduate Spanish students and stands out among many translators with its excellent features, there are still some technical problems. For instance, it may suggest contextually inappropriate words, create ambiguity, or result in incorrect sentence syntax after substitutions. Researchers believe that developers can solve this problem by improving the development of artificial intelligence techniques on DeepL. Developers can expand the database of natural mechanisms of DeepL, expand the corpus, and keep updating in order to add new definitions of words in new environments and eliminate outdated expressions with the changing of the times. Developers could enhance the functionality of DeepL to operate in network-less environments. This breakthrough can significantly overcome limitations and provide greater convenience for users.

Another conclusion worth emphasizing is that the use of DeepL to enrich the vocabulary of articles does not have a direct and strong connection with the improvement of the user's own vocabulary. In some cases, it can even have some negative effects. After using DeepL for an extended period of time, it is possible to develop a reliance on this application, leading to difficulties or even withdrawal syndrome in DeepL when writing independently. Many students realize that in the long run, it may not be a beneficial thing for their vocabulary improvement. DeepL offers alternative words that can

expand students' thinking but may also confine their vocabulary choices to its corpus. While students appear to have more options, they are trapped in a larger cage. It is encouraging that students can recognize these issues independently, and they should use the AI translator smartly. It is important for language teachers working in digital school environments to be aware of the strengths and weaknesses of this technology in order to be able to teach their students how to use it in a way that sustains and, where possible, improves language learning.

This study fills in the gap concerning the perceptions and experiences of students who use AI translators to assist them in learning Spanish. As the second most spoken language in the world, Spanish remains highly valuable for research in the field of AI translation concerning Spanish because of its widespread use, diverse linguistic cultures and rules across different regions. This study is expected to provide an important reference for researchers, educators, and language learners in the fields of language acquisition and translation. This study focused on the subjective views of college students and lacked objective empirical evidence regarding whether DeepL actually enhanced the vocabulary of the articles and improved students' writing skills. Future studies are expected to investigate the actual situation of students using AI translators from a more objective perspective.

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