Proficiency and the Use of Machine Translation: A Case Study of Four Japanese Learners

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While the use of machine translation (MT) in the classroom has been explored from various perspectives, the relationship between language proficiency and MT use regarding learners' behaviors and beliefs remains unclear in the research literature. This study focused on four Japanese learners with various language proficiencies from a fourth-year Japanese language class (two advanced-level, one intermediate-high, and one novice-high level) and investigated how they edited self-written text with MT by examining the scope and types of revisions they made as well as their perceptions about using MT for editing. The data included four types of drafts of a writing assignment: (1) D1 (self-written drafts in Japanese without the help of MT); (2) D2 (revised corresponding drafts in L1 provided by MT); (3) D3 (drafts in Japanese provided by MT based on D2); (4) D4 (revised drafts based on comparison of D1 and D3) and their reflection papers. The results show that the four participants adopted various ways of editing self-written text. While all the participants' revisions are at local levels, the two advanced level learners primarily focused on vocabulary revision while the other two learners' revisions extended to the sentence level. The findings also show that the advanced-level and intermediate-high-level learners have various degrees of positive attitudes toward using MT. In contrast, while the positive effects of MT use are acknowledged, the novice-high level learner also feels ashamed and dishonest when using MT. This article concludes with insights that can assist instructors in facilitating MT as a pedagogical tool for language learning and teaching with diverse students.

INTRODUCTION

The rapid development of Machine Translation (MT) has drawn attention from foreign language learners and instructors. MT, especially free online MT such as Google Translate (GT), has become easily accessible to almost everyone, everywhere, at any time. Also, the quality of translation provided by MT has improved significantly because of the advance in artificial intelligence. For example, GNMT (Google Neural Machine Translation), launched by Google Translate in 2016 and updated in 2017, can learn from millions of examples on the internet and provide a substantially better quality of translation by encoding the semantics of sentences rather than merely memorizing phrase-to-phrase translation (Schuster et al., 2016).

While language learners are taking advantage of MT to look up vocabulary or complete course assignments, language instructors are concerned about student usage of MT because of perceived adverse effects on language learning and academic integrity (Clifford et al., 2013; Correa, 2011; Faber & Turrero-Garcia, 2020; Jolley & Maimone, 2015; Tian, 2018). Recent studies advocate the necessity and importance of preparing learners with effective and responsible ways to use MT for language learning rather than continually discouraging its use (Correa, 2014; Ducar & Schocket, 2018; Enkin & Mejías-Bikandi, 2016; Groves & Mundt, 2015, 2021; Henshaw, 2020; Mundt & Groves, 2016). A growing body of literature explores various ways of integrating MT into language teaching and learning and reports a great variety of potential from the cognitive, linguistic, and affective perspectives (Benda, 2013; Faber &

Turrero-Garcia, 2020; Garcia & Pena, 2011; Jiménez-Crespo, 2017; Kliffer, 2005; Lee, 2020; Niño, 2009; Stapleton & Kin, 2019; Tsai, 2019, 2020; White & Heidrich, 2013; Xu, 2020, 2021).

However, several crucial issues remain unaddressed in the literature. First, there is a lack of systematic collection and analysis of language learners' MT use data. Chapelle (2005) and Fischer (2007) argue that it is essential to investigate what students do with a particular technology to understand better how students interact with it and ultimately guide them to develop the metacognitive knowledge and skills necessary to succeed. Second, research is scant regarding how learners with diverse language proficiency levels interact with MT (Kliffer, 2005; Lee, 2020; Tsai, 2020). As Lee (2020) points out, language proficiency is one of the essential variables affecting learner perceptions and behaviors of MT use. Given that we interact with students from diverse proficiency levels in the classroom, it is vital to explore how MT affects them individually to provide students with support and guidance. Finally, previous research is mainly concerned with ESL or Spanish learners. Examination of Japanese learners and their use of MT is still lacking.

Therefore, to address this gap in the current literature, this case study focused on four Japanese language learners with various language proficiencies and investigated how they used MT to edit self-written compositions and perceived such use. Comparisons made on the four learners' self-written L2 texts and revised texts with the help of MT revealed students' usage of MT by examining the types and scopes of revisions they made. In addition, analysis of reflection papers revealed student perceptions of their use.

BACKGROUND

Learner Use of MT

Regardless of how language instructors view MT use for language learning, positively or negatively, learners frequently use MT for a broad range of purposes (Clifford et al., 2013; Correa, 2011; Faber & Turrero-Garcia, 2020; Jolley & Maimone, 2015; Tian, 2018). For example, Jolley and Maimone (2015) surveyed 139 students enrolled in Spanish courses at five U.S. universities and found 74.22% of participants reporting occasional (38.28%) or frequent (35.94%) use of Free Online Machine Translation (FOMT) tools.

Language learners also self-report that they commonly use MT for writing assignments by translating between L1 and the target languages. Jolley and Maimone (2015) found that more than 85% of students responded using FOMT for writing assignments, and 70.08% reported using FOMT for translation assignments. Clifford et al. (2013) reported that 43% of participants used MT for translating from English into the target language for writing assignments, and 51% used MT to translate from the target language to English to double-check writing.

In addition, language learners' self-reports reveal they use MT more as a dictionary to translate individual words and short phrases while rarely translating sentences or paragraphs. Clifford et al. (2013) found that 89% of the students who participated in the study used MT to translate words while only 16% and 7% used MT to translate whole sentences and short paragraphs, respectively. Similarly, Jolley and Maimone (2015) reported that 65.08% of students said they used FOMT to translate individual words. More than 85% of students responded that they never or infrequently used FOMT to translate entire paragraphs or texts.

What language learners do with MT when editing self-written texts, however, has not received sufficient attention. Lee (2020) seems to be the only research that addresses this issue. Thirty-four university students from Korea with intermediate and high-intermediate levels of English proficiency participated in the study. After watching a TED video, they wrote a one-page paper on the video in their L1, Korean. Then they translated their self-written L1 texts into English. After that, they used MT to translate their L1 texts into English. Eventually, they edited their translations by comparing them with the MT translation. The results showed that the participants made the most changes at the lexical level, twice as frequently as at the phrase or clause/sentence level. Also, there were no changes at the symbol or paragraph levels. Expression replacement was the most frequent revision purpose, followed by editing grammar and fixing vocabulary.

In sum, students' self-reports are the primary basis for findings in the literature about students' MT use. In addition, little research has addressed what students do with MT when editing compositions. Fischer (2007) points out the danger of overreliance on self-report data because of the possible discrepancy between statements of learners' perceptions/beliefs and their actual behaviors. Fischer (2007) and Chapelle (2005) argue that it is essential to closely examine what students do with technology without simply relying on their self-reports. Thus, a more detailed examination of what students actually do with MT when editing self-written texts is necessary.

Language Proficiency Level and MT Use

Language proficiency is one of the crucial variables potentially affecting the effectiveness of MT use for writing (Lee, 2020). Indeed, existing literature focuses on evaluating whether MT use improves the quality of writing at different proficiency levels (Garcia & Pena, 2011; Tsai, 2020) and student perceptions/beliefs of using MT (Kliffer, 2005; Lee, 2020; Tsai, 2020).

Previous studies reveal that MT use is more helpful to improve the quality of writing for students with lower proficiency than those with higher abilities. For example, Garcia and Pena (2011) found that among 16 beginner level (n=9) and early intermediate level (n=7) learners of Spanish, the lower the language mastery, the more words learners produced using MT. Tsai (2020) used Google Translate (GT) to compare writing assignments created by two groups of students in Taiwan: English majors with higher English proficiency and non-English majors with lower English proficiency. The results show non-English major students' revised versions of their compositions after editing with the help of GT are almost the equivalent level of those produced by English majors. He concluded that using GT in EFL writing could improve the writing performance of EFL students with lower English proficiency.

Further, while learners with various proficiency levels agree upon the effectiveness of MT use to improve the quality of their writing, those with a lower proficiency level tend to hold a more positive attitude toward the use of MT for writing activities. Kliffer (2005) found that weaker students appreciated the post-editing exercise with MT more than the stronger ones. Evaluating MT translation and correcting its mistakes proved less stressful for students with lower language proficiency than translating entirely by themselves. Tsai (2020) also found that non-English major students with lower English proficiency levels showed significantly higher satisfaction with GT and substantially higher willingness to continue using GT than English major students. These results are also in line with Lee's (2020) findings that the use of MT for EFL writing assignments improves low-proficiency EFL students' confidence and English writing capacity. Lee (2020)

found that lower-level students were more convinced of MT's advantages regarding appropriate word choice and identifying and fixing lexico-grammatical errors.

Meanwhile, Lee (2020) revealed that students with higher proficiency levels highlighted more drawbacks to MT in their reflection papers. Although they acknowledged MT as helpful at the vocabulary level, they did not believe that was the case at the sentence level. They were also concerned about the translation accuracy of longer texts provided by MT.

As mentioned above, previous studies have shown that MT can improve the final product of students' writing assignments when used for editing, especially for less proficient students. However, few studies have closely examined what learners do with MT when editing compositions. In other words, in addition to a lack of research on MT use while editing, whether and how proficiency level affects learners' use of MT when editing compositions needs further exploration.

Also, research on MT use of less-commonly taught languages is scant. The previous studies are mostly concerned with EFL (Benda, 2013; Lee, 2020; Stapleton & Kin, 2019; Tsai, 2019, 2020) and Spanish (Correa, 2014; Enkin & Mejías-Bikandi, 2016; Garcia & Pena, 2011; Jiménez-Crespo, 2017; Niño, 2009). Little research has focused on less-commonly taught languages such as Japanese.

Thus, as guided by Fischer's (2007) proposal about the significance of monitoring students' progress by tracking their behaviors using CALL software, this article aimed to understand MT use in teaching practice by examining what learners do when editing with MT. Participants' revisions, both scope and types, and their perceptions about MT use were analyzed. The present study used a case study approach and focused on four Japanese learners with various proficiency levels to address the following research questions:

> 1) Do learners with various language proficiency levels interact with MT for editing differently regarding the scope and types of revision?
>
> 2) Do learners with various language proficiency levels have different perceptions of using MT for editing?

METHODS AND PROCEDURES

This study adopted a case study approach because much can be learned holistically and closely about learners' behaviors and perspectives by examining a few rather than many research subjects (Duff, 2012). There was another practical reason for this approach. The four participants in this research were from a small 14-student class. Only four were selected because they represented different proficiency levels and provided more detailed reflection papers indicating greater engagement with the process than other students.

Context of the Study

The present study took place in a fourth-year Japanese language class at a public university in the United States. The researcher, who was also the class instructor, introduced GT to students during the fall semester, during which students edited four compositions with GT and other MT chosen by students themselves. They continued to use MT for editing during the following spring semester. Thus, they had almost one year of experience using MT for editing.

Before the first composition task in the fall semester, the instructor conducted a discussion session. In addition to student experiences and thoughts about GT, discussion occurred about moral issues, strengths, and pitfalls regarding GT use (Ducar & Schocket, 2018). Second, the instructor explained the purpose of using GT for editing; that is, given that GT can serve as a peer in L2 revision processes (Correa, 2014; Ducar & Schocket, 2018; Lee, 2020), using GT for editing could help improve the quality of their compositions. Students also learned that final drafts would be graded, but interim revisions using GT would not. The intent was that students understand writing as a process rather than a short-term product, so they should focus less on grades and more on the revision process.

Last, because GT is still evolving and far from perfect, students were instructed to actively decide whether to accept or reject GT suggestions rather than passively copy-and-paste GT's translations. To help students make judgments about the translations provided by GT, the instructor demonstrated the use of quotation marks (" ") and a wildcard (*) in Google Search using examples of particles, collocations, and phrases. (See Ogino (2014) for details of web search techniques for Japanese and Han and Shin (2017) for more information on Google Search techniques for EFL.) Meanwhile, translating sentences back and forth several times, rather than just once, was encouraged before deciding whether to adopt GT's translations into final drafts.

In the following spring semester, students used MT to edit the final writing project. In addition, students also submitted a reflection paper about MT usage and challenges and successes they experienced. (See Appendix A for reflection paper instructions). All essay drafts for the final writing project and the reflection paper completed during the spring semester serve as data for the present study.

Cyberbullying was the topic of the final writing project. Before the writing assignment, students read an article written for Japanese learners about bullying in Japan and another original online article regarding cyberbullying in Japan. Then students researched cyberbullying in their countries, i.e., China, Indonesia, and the United States, and composed an essay at home. The instructions specified that the composition must include background information about, characteristics of, and solutions to cyberbullying.

Table 1 shows the procedure for using MT in editing in this study. Students completed the first draft (Draft 1) in Japanese without the help of MT. Then, they used MT to translate their self-written Draft 1 into their native language to complete Draft 2. Next, they revised the text in Draft 2, which was in their L1, to ensure their intended messages were correctly delivered. Once they finished revising Draft 2, MT translated Draft 2 into Japanese to complete Draft 3. The next step compared their self-written Draft 1 in Japanese with Draft 3, also in Japanese, translated by MT. Students then revised Draft 1 by comparing Draft 1 and Draft 3 and eventually wrote their Draft 4. Students submitted all four drafts. After that, students scheduled individual meetings with the instructor to discuss their Draft 4, and they then completed Draft 5, the final version of the assignment, based on feedback from the student-teacher meetings.

Table 1
The Procedure for Using MT in Editing

Step 1	Write in Japanese without the help of MT (Draft 1)
Step 2	Use MT to translate Draft 1 into L1 (Draft 2)

Step 3	Edit Draft 2 and translate it back to Japanese using MT (Draft 3)
Step 4	Revise Draft 1 by comparing it with Draft 3 (Draft 4)
Step 5	Submit Draft 1, 2, 3, and 4 as one file.
Step 6	Revise Draft 4 after individual meetings with the instructor
Step 7	Submit Final Draft (Draft 5)

Participants

This study focused on four participants: Alex, Bella, Cara, and Danna (pseudonyms). Alex and Bella are advanced learners. Cara and Danna are intermediate and novice learners (see Table 2). The researcher, who was also the course instructor, and another Japanese instructor in the same program, assessed the four participants' proficiencies (ACTFL Proficiency Scale) based on the participants' class assignments and classroom performance.

Table 2
Participants' Background Information

Name	L1	Proficiency Level	Japanese Learning Experience
Alex	English	Advanced-Mid	Alex, a heritage learner, spoke Japanese at home with his mother. He grew up in Japan and attended an American school until high school on an American military base in Japan before moving back to America. Alex passed the Japanese Language Proficiency Test (JLPT) N2.
Bella	Chinese	Advanced-Mid	Bella started to learn Japanese in college. She studied abroad in Japan during the summer after completing the second-year Japanese class. Bella frequently watched Japanese TV programs, anime, and movies. She also passed the JLPT N2.
Cara	English	Intermediate-High	Cara started to learn Japanese with a private tutor in high school. She traveled to Japan but had no study abroad experience in Japan.
Danna	English	Novice-High	Danna started to learn Japanese in college. She did not have travel or study abroad experience in Japan.

Data Collection and Analysis

This study intends to provide a detailed description and grounded interpretation of Japanese learners' MT usage by analyzing two types of data: student compositions and reflection papers.

Regarding student compositions, the four participants' self-written Japanese drafts (Draft 1) and revised drafts (Draft 4), as well as MT translation (Draft 3), were compared to identify the types and scope of changes participants made (see Table 3). The framework for analyzing types and scope of revisions was adopted from Sengupta (1998) and Min (2006) (see Table 3). The type of revision refers to addition, deletion, substitution, permutation,

distribution, consolidation, and re-ordering. The scope of revision refers to the linguistic unit of change, including symbols, words, phrases, clauses, sentences, and paragraphs.

Table 3
Types and Scope of Revision

Types of revision	**Scope of revision**
1 Addition: Reviser adds information	1 Symbols
2 Deletion: Reviser deletes information	2 Words
3 Substitution: Reviser substitutes information	3 Phrases
4 Permutation: Reviser rephrases information	4 Clauses
5 Distribution: Reviser rewrites same information in larger chunks	5 Sentences
6 Consolidation: Reviser puts separate information together	6 Paragraphs
7 Re-order: Reviser moves information	

The author independently conducted the analysis three times during two weeks. In terms of the scope of revision, there were 24 agreements and no disagreements. There were two disagreements and 26 agreements about the types of revision. The total intra-rater reliability percentage was 93%.

Table 4 is an example of coding students' writing by types and scope of revision. (For more coding examples, see Appendices B and C). All the examples in this article are presented in Kana and Kanji first. They are also transcribed in italics using the revised Hepburn system of Romanization. English translations provided by MT or the author are also specified. The revisions for discussion are underlined in sentences with Kana and Kanji and in boldface with transcribed sentences.

Table 4
Coding Example of Composition

Draft 1	トランプ大統領の奥さんメラニア・トランプは「Be Best」といういじめに関するキャンペーンをしている。 *Toranpu daitōryō no* ***okusan (a)*** *merania* **・*(b)*** *toranpu wa* ***'Be Best' to iu ijime ni kansuru kyanpēn o shite iru. (c)***
Draft 2	(Google Translation based on Draft 1) President Trump's wife, Melania Trump, is campaigning for bullying called "Be Best."
Draft 3	(Google Translation based on revised English version of Draft 2) トランプ大統領の妻であるメラニアトランプは現在、彼女の「ベスト」キャンペーンでのいじめをやめるために働いています。 *Toranpu daitōryō no* ***tsumadearu (a)*** *merania (b) toranpu wa* ***genzai*** *(d),* ***kanojo no 'besuto'kyanpēn de no ijime o yameru tame ni hataraite imasu****. (c)* Google Translation: President Trump's wife, Melania Trump, is currently working to stop bullying in her "best" campaign.

Draft 4	トランプ大統領の妻さんであるメラニアトランプは現在、「Be Best」という運動ネットいじめをやめるようにしている。 *Toranpu daitōryō no* ***tsumasan(a)*** *dearu merania (b) toranpu wa* ***genzai*** *(d),* ***'Be Best' to iu undō netto ijime o yameru yō ni shite iru.*** *(c)*
Note: The Japanese sentence in Draft 4 is not grammatical. What the student intended to say is: "President Trump's wife, Melania Trump, is currently working to stop cyberbullying in a campaign called 'Be Best.'"	

In Table 4, the writer, Cara, changed "*Okusan* (wife)" in Draft 1 to "*tsumasan* (wife)" in Draft 4, shown as (a). This revision is a substitution regarding the type of revision and a word-level substitution concerning revision scope. She also deleted the "・," shown as (b) in Draft 1, a deletion at the symbol level. She added "*genzai* (currently)," shown as (d) in Draft 4, which represents an addition at the word level. Another revision, (c), is a clause-level distribution revision because, as the translations show, "working to stop cyberbullying in a campaign called 'Be Best'" represents the similar information as "campaigning for bullying called 'Be Best'" in larger chunks.

Worth noting is that since this study focuses on *what the participants did* to revise using MT rather than *what should be revised*, the remaining errors in Draft 4 were not examined. Therefore, whether and how much the overall quality of the compositions changed using MT editing is also not discussed.

Regarding students' reflection papers, the author's coding disclosed various themes regarding student MT use perceptions (Baralt, 2012; Duff, 2012; Mackey & Gass, 2015). Some sample questions guided the reflection (See Appendix A). While the participants did not answer all the sample questions, their responses included the following themes: the benefits, challenges, strategies, and future use of MT for revision. Table 5 is an example of coding one participant's (Cara) perceptions.

Table 5
Coding Example of Reflection Paper

Theme	**Code**	**Examples**
Benefits	Reminder	GT uses a structure in a way I didn't think about before.
	Proofreader	I use it to check if my sentences make sense.
	Confidence	I feel like I am able to write better compositions with MT.
	Trust	This method has helped me trust MT more.
Challenges	Difficulty to make decisions	Learning how to accept or reject MT sentences has been difficult
Strategies	Online dictionary	Jisho.org
	Native speakers	I use the online platform HiNative for more specific questions.

	Google Search	I use Google to help confirm particles or phrases by inputting them into the search bar and seeing which yields more results.

RESULTS

Research Question 1

The first research question is: Do learners with various language proficiency levels interact with MT for editing differently regarding the scope and types of revision? The following section presents a global view of student MT usage followed by individual sections on each participant (Alex: Advanced-Mid level; Bella: Advanced-Mid level; Cara: Intermediate-High level; Danna: Novice-High level).

Table 6 presents an overview of the numbers of words and sentences in Draft 1 (self-written texts) and Draft 4 (revised texts after using MT for editing). While the length of each individual's composition varies, the numbers in Alex's and Bella's essays remained almost the same before and after editing with MT. On the other hand, those in Cara's and Danna's slightly increased.

Table 6
Numbers of Words and Sentences in Draft 1 and Draft 4

	Words		**Sentences**	
	Draft 1	**Draft 4**	**Draft 1**	**Draft 4**
Alex	807	811	25	24
Bella	2138	2139	48	48
Cara	882	954	23	24
Danna	1074	1136	28	30

Table 7 shows the scope of revisions. Alex's corrections were dominantly at the word level (86%). Bella mostly edited words (71%) and phrases (21%). Half of Cara's editions were at the word level (56%). She also edited phrases (12%), clauses (12%), and sentences (16%). In contrast, most of Danna's were at the sentence level (53%), followed by the word level (34%).

Table 7
Scope of Revision

	Alex		**Bella**		**Cara**		**Danna**	
Symbol	0	0%	0	0%	2	4%	1	3%
Word	12	86%	10	71%	32	56%	11	34%
Phrase	1	7%	3	21%	7	12%	2	6%
Clause	0	0%	1	7%	7	12%	1	3%
Sentence	1	7%	0	0%	9	16%	17	53%

Paragraph	0	0%	0	0%	0	0%	0	0%
Total	14	100%	14	100%	57	100%	32	100%

As can be seen from Table 8, the four participants adopted different approaches when editing. First, it is notable that Alex and Bella made significantly fewer revisions than Cara and Danna. Both Alex and Bella made 14 changes, while Cara had 57 and Danna had 32 revisions. Second, there are apparent differences between the types of revisions the four participants made. Alex's revisions were mostly substitutions (79%). While Bella used substitution most (64%), she used other types of revision. Half of Cara's modifications were substitutions (51%), followed by distributions (23%). No specific kind of revision was dominant in Danna's draft.

Table 8
Type of Revision

	Alex		**Bella**		**Cara**		**Danna**	
Addition	0	0%	3	21%	7	12%	6	19%
Deletion	1	7%	1	7%	3	5%	3	9%
Substitution	11	79%	9	64%	29	51%	7	22%
Permutation	0	0%	0	0%	4	7%	9	28%
Distribution	0	0%	1	7%	13	23%	6	19%
Consolidation	1	7%	0	0%	0	0%	0	0%
Re-order	1	7%	0	0%	1	2%	1	3%
Total	14	100%	14	100%	57	100%	32	100%

Alex's Revisions

As mentioned previously, most of Alex's revisions were substitutions (79%) at the word level (86%). Alex substituted the original words or phrases in Draft 1 with GT's suggested ones in Draft 3. Here are two examples:

Example 1

a.中学と高校の男性の 7%はネットいじめにあったが、それに比べてネットいじめにあった女性は 21%だった。(Draft1)
*Chūgaku to kōkō no dansei no 7 pāsento wa netto ijime ni atta ga, sore **ni kurabete** netto ijime ni atta josei wa 21 pāsento datta.*

b.オンラインでいじめられた少女の 21%と比較して、中学生と高校生の 7%がオンラインでいじめられました。 (Draft 3)
*Onrain de ijime rareta shōjo no 21 pāsento **to hikaku shite**, chūgakusei to kōkōsei no 7 pāsento ga onrain de ijime raremashita.*

c. 中学と高校の男性の 7%はネットいじめにあったが、それと比較してネットいじめにあった女性は 21%だった。 (Draft 4)

Chūgaku to kōkō no dansei no 7 pāsento wa netto ijime ni attaga, sore ***to hikaku shite*** *netto ijime ni atta josei wa 21 pāsento datta.*
[Seven percent of middle school and high school male students were cyberbullied, compared to 21% of female students (translated by the author)].

Example 2

a. ネットいじめにあったら、様々な対策があるのだ。 (Draft 1)
*Netto ijime ni at****tara****, samazama na taisaku ga aru noda.*

b. インターネットでいじめられている場合、様々な対策があります。 (Draft 3)
Intānetto de ijime rarete iru ***baai***, samazama na taisaku ga arimasu.

c. ネットいじめにあう場合、様々な対策があるのだ。 (Draft 4)
Netto ijime ni au ***baai***, samazamana taisaku ga aru noda.
[There are various countermeasures when dealing with cyberbullying (translated by the author).]

In Example 1, he chose to use "*hikaku* (to compare)," a Kango suggested by GT, to replace the original "*kuraberu* (to compare)." In Example 2, "*tara* (if; when)" was substituted with "*baai* (case, situation)" suggested by GT. In fact, he changed all three '*tara*" in Draft 1 to "*to*" and "*baai*" in Draft 4 based on the suggestions by GT.

Worth noting is that the changes Alex made were primarily about style. The expressions he used in the original sentences, "*hikaku* (to compare)" in Example 1 and "*tara* (if; when)" in Example 2, were correct. However, the final choices he made, "*kuraberu* (to compare)" in Example 1 and "*baai* (case, situation)" in Example 2, were more preferred for academic or formal writing.

Bella's Revisions

Bella's revisions were mainly at the word level (71%). Nine of her total 14 revisions were substitutions (61%). Unlike Alex's revisions, the words she substituted with were not always the same as the suggested ones by GT because, according to her reflection paper, of the poor performance of GT on the translation between Chinese and Japanese. Consequently, half of her revisions (7 cases) were related to GT's suggestions, while the other seven modifications seemed irrelevant to GT's translations. All seven GT-related revisions were at the word level. The following are two GT-related examples.

Example 3

a. 最後に問題は根本的に解決できない上に、ネットいじめの悪循環となる恐れがある。 (Draft 1)
Saigo ni mondai wa konponteki ni kaiketsu dekinai ueni, netto ijime no akujunkan ***to*** *naru osore ga aru.*

b.最後の問題を根本的に解決することはできない、またネットいじめの悪循環になる。 (Draft 3)

*Saigo no mondai o konponteki ni kaiketsu suru koto wa dekinai, mata netto ijime no akujunkan **ni** naru.*

c. 最後に問題は根本的に解決できない上に、ネットいじめの悪循環になる恐れがある。 (Draft 4)
*Saigo ni mondai wa konponteki ni kaiketsu dekinai ue ni, netto ijime no akujunkan **ni** naru osore ga aru.*
[Finally, the problem cannot be fundamentally solved and can lead to a vicious cycle of cyberbullying (translated by the author).]

Particles were her primary revision—five out of the 14 changes she made involved particles. Bella used Example 3 in her reflection paper to illustrate how GT helped her fix particle issues. She noted that she accepted the suggested particle when Draft 3 shared the same structure as the original sentence she composed in Draft 1.

Example 4

a. 大勢の加害者は自分がネットいじめを行っていることに無自覚なのは一つ目の特徴だ。 (Draft 1)
***Ōzei** no kagaisha wa jibun ga netto ijime o okonatte iru koto ni mujikaku na no wa hitotsume no tokuchō da.*

b.多くの加害者に対する自分のネットいじめをしたことについて自覚は初の特徴がない。 (Draft 3)
***Ōku** no kagaisha ni taisuru jibun no netto ijime o shita koto ni tsuite jikaku wa hatsu no tokuchō ga nai.*

c. 多くの加害者は自分がネットいじめを行っていることに無自覚なのは一つ目の特徴だ。 (Draft 4)
***Ōku** no kagaisha wa jibun ga netto ijime o okonatte iru koto ni mujikaku na no wa hitotsume no tokuchō da.*
[The first feature is that many perpetrators are unaware that they are cyberbullying (translated by the author)].

Example 4 is like Alex's examples. While "*Ōzei* (many)" in Draft 1 is correct, "*Ōku* (many)" was substituted for it in Draft 4. Both "*Ōzei* (many)" and "*Ōku* (many)" are commonly used in formal writing. Bella may have also had a concern regarding formal writing style, which resulted in changing one word to another even though both are appropriate for formal writing.

Cara's Revisions

Unlike Alex's and Bella's word-focused revisions, Cara's revisions were not only at the word level (56%) but also extended to the phrase (12%), clause (12%), and sentence (16%) levels.

In Example 5, Cara replaced self-written words or phrases with GT's suggestions while keeping the original structure.

Example 5

a. その後、新型コロナなウイルスのせいで学校が閉まることになっているから、若者がネットを使っている時間が増えて、ネットいじめが増加する恐れがある。 (Draft 1)
***Sonogo**, shingata koronana uirusu no **sei** de gakkō ga **shimaru koto ni natte iru** kara, wakamono ga **netto o tsukatte iru** jikan ga fuete, netto ijime ga **z̄ōka** suru osore ga aru.*

b. さらに、新しいコロナウイルスが原因で学校が閉鎖されるため、若者がオンラインで過ごす時間が増え、オンラインでのいじめが増える危険性があります。 (Draft 3)
***Sarani**, atarashī koronauirusu ga **genin de** gakkō ga **heisa sareru** tame, wakamono ga **onrain de sugosu** jikan ga fue, onrain de no ijime ga **fueru** kikensei ga arimasu.*

c. さらに、新型コロナウイルスが原因で学校が閉鎖されるから、若者がオンラインで過ごす時間が増えて、ネットいじめも増える恐れがある。 (Draft 4)
***Sarani**, shingata koronauirusu **ga genin de** gakkō ga **heisa sareru** kara, wakamono ga **onrain de sugosu** jikan ga fuete, netto ijime **mo fueru** osore ga aru.*
[In addition, the closure of schools because of the new coronavirus could increase young people's time online and cyberbullying (translated by the author)].

In Example 5, Cara kept the basic structure of her original sentence while replacing words and phrases suggested by GT. Like Alex and Bella, Cara decided to make such changes based on GT's suggestions even though her original sentences were correct. Interestingly, unlike Alex and Bella's revisions for formal writing style, Cara exhibited no clear patterns for such substitution. For example, she probably changed "*sei* (reason)" and "*shimaru koto ni natte iru* (be decided to close)" in Draft 1 to "*genin* (reason)" and "*heisa sareru* (be closed)" in Draft 4 to use a more formal writing style. However, it is not clear why she decided to change "*z̄ōka* (to increase)" in Draft 1 to "*fueru* (to increase)," given that "*z̄ōka* (to increase)" is a Kango more commonly used in academic writing than "*fueru* (to increase)."

In addition to substituting with what GT suggested, she applied various strategies to reorganize her original composition. In Example 6, neither her original sentence in Draft 1 nor the GT-suggested one in Draft 3 was natural. Cara accepted the sentence structure GT provided and rewrote the whole sentence using her own linguistic knowledge to compose a correct sentence.

Example 6

a. 2 つ目は、方法によって男女別がある。 (Draft 1)
Futatsume wa, hōhō ni yotte danjo betsu ga aru.

b. 2 番目の特徴は、方法に応じて、いじめが性別によって異なることです。 (Draft 3)
Nibanme no tokuchō wa, hōhō ni ōjite, ijime ga seibetsu ni yotte kotonaru koto desu.

c. 二番目の特徴は、性別によって、ネットいじめのしかたが異なることだ。 (Draft 4)
Nibanme no tokuchō wa, seibetsu ni yotte, netto ijime no shikata ga kotonaru koto da.
[The second feature is that cyberbullying differs depending on gender (translated by the author)].

Meanwhile, there are cases where she discarded the full self-written text in Draft 1 and accepted almost everything GT suggested, as shown in Example 7. She took nearly all GT's sentences but only kept one original word, "*oya* (parents)," and deleted one phrase, "*korera no* (these)," from the sentence in Draft 3.

Example 7

a. 様々なアプリで起こっているが、先生・親・傍観者もネットいじめのことに反して、被害者の言葉を信じているから様々な対策がある。 (Draft 1)
Samazama na apuri de okotte iru ga, sensei ***oya*** *bōkansha mo netto ijime no koto ni hanshite, higaisha no kotoba o shinjite iru kara samazama na taisaku ga aru.*

b. ネットいじめはこれらのさまざまな形をとっていますが、教師、保護者、傍観者は被害者を信じ、いじめに反対する傾向が強いため、さまざまな対策があります。 (Draft 3)
Netto ijime wa korera no samazama na katachi o totte imasuga, kyōshi, ***hogosha****, bōkansha wa higaisha o shinji, ijime ni hantai suru keikō ga tsuyoi tame, samazama na taisaku ga arimasu.*

c. ネットいじめはさまざまな形をとっているが、教師、親、傍観者は被害者を信じて、いじめに反対する傾向が強いため、さまざまな対策もある。 (Draft 4)
Netto ijime wa samazama na katachi o totte iru ga, kyōshi, ***oya****, bōkansha wa higaisha o shinjite, ijime ni hantai suru keikō ga tsuyoi tame, samazama na taisaku mo aru.*
[Cyberbullying takes many forms, but teachers, parents, and bystanders have a strong tendency to believe victims and oppose bullying, so there are various countermeasures (translated by the author)].

Danna's Revisions

Because of many errors in her compositions, the corresponding English sentences in Draft 2 are also provided in the following examples to understand better what Danna intended to express. While the author provided English translations for the sentences in Draft 4, the translations might not correctly reflect Danna's original thought because of the ungrammaticality of the Japanese sentences she wrote.

Compared to the other three participants' revisions, where more than 50% of revisions were at the word level, Danna's revisions were primarily at the sentence level (53%). Five of the six additions were new sentences. Forty-seven percent of all revisions were permutations (28%) and distributions (19%).

According to her reflection paper, Danna also used her linguistic knowledge and other MT to decide on acceptance or rejection of the translations by MT. In Example 8, Danna accepted the suggested structure and most vocabulary in Draft 3 while only keeping the

original words "*ninshiki* (acknowledgment)" and "*netto ijime* (cyberbully)." In her reflection paper, she mentioned that she had used two different MTs (GT and Yandex Translator) to cross-reference the English translations. Eventually, she decided to keep her original word "*ninshiki* (acknowledgment)" because she believed that "*ninshiki* (acknowledgment)" was more appropriate than "*chishiki* (knowledge)" suggested by GT.

Example 8

a. ネットいじめの特徴はやさしい見えないから、先生と両親の認識がなくて、いじめかいじめられる子供の数が増えている続く。 (Draft 1)
Netto ijime *no tokuchō wa yasashī mienai kara, sensei to ryōshin no* ***ninshiki*** *ga nakute, ijime ka ijime rareru kodomo no kazu ga fuete iru tsudzuku.*

b. Since the features of online bullying are not easy to spot, the number of children being bullied continues to increase without teacher or parental knowledge. (Draft 2)

c. オンラインいじめの特徴を見つけるのは簡単ではないため、いじめられている子供やいじめの数は、教師や保護者の知識なしに増え続けています。 (Draft 3)
Onrain ijime *no tokuchō o mitsukeru no wa kantan dewa nai tame, ijime rarete iru kodomo ya ijime no kazu wa, kyōshi ya hogosha no* ***chishiki*** *nashi ni fuetsudzukete imasu.*

d. ネットいじめの特徴を見つけるのは簡単ではないため、いじめといじめられている子供たちの数は、教師と親の認識なくても増え続けている。 (Draft 4)
Netto ijime *no tokuchō o mitsukeru no wa kantan dewa nai tame, ijime to ijime rarete iru kodomo tachi no kazu wa, kyōshi to oya no* ***ninshiki*** *nakute mo fue tsudzukete iru.*
[Since the features of online bullying are not easy to spot, the number of children being bullied and bullying continues to increase even without teacher or parental acknowledgment (translated by the author)].

There were a substantial number of cases in which Danna rejected better alternatives provided by MT. While this study did not focus on whether the accuracy and quality of compositions changed between Draft 1 and Draft 4, most of Danna's Draft 4 was still ungrammatical and unnatural. Example 9 and Example 10 show that Danna decided to keep or revise her original sentences and reject the Japanese sentences provided by GT, which were more grammatical and comprehensible.

Example 9

a. 子供はレポートをしてほしくない場合は、両親はうれしいしている。 (Draft 1)
Kodomo wa repōto o shite hoshiku nai baai wa, ***ryōshin wa ureshī shite iru****.*

b. If the child does not want the report, the parents seem happy they do not know about the cyberbullying. (Draft 2)

c. 子供が報告を望まない場合、親はネットいじめについて知らないため、幸せそうに見えます。 (Draft 3)
Kodomo ga hōkoku o nozoma nai baai, oya wa netto ijime ni tsuite shiranai tame, shiawasesō ni miemasu.

d. 子供はレポートをしてほしくない場合は、両親の生活はうれしそうので、問題をみえない。 (Draft 4)
Kodomo wa repōto o shite hoshiku nai baai wa, ryōshin ***no seikatsu wa ureshisō node, mondai o mie nai****.*
[If the child does not want to report (being bullied), the parents' life seems happy because they do not see the issue (translated by the author)].

In Example 9, compared to her original sentence in Draft 1, she kept most of her original sentence and revised the main clause in Draft 4.

Example 10

a. このパワーコンプレックスを壊すのは難しい時に、考えている (Draft 1)
Kono pawākonpurekkusu o kowasu no wa muzukashī toki ni, kangaete iru.

b. Bullied people think its [*sic*] difficult to destroy this power complex. (Draft 2)

c. いじめられている人々は、このパワーコンプレックスを破壊するのは難しいと考えています。 (Draft 3)
Ijime rarete iru hitobito wa, kono pawākonpurekkusu o hakai suru no wa muzukashī to kangaete imasu.

d. このパワーコンプレックスを壊すのは難しい時に、考えている (Draft 4)
Kono pawākonpurekkusu o kowasu no wa muzukashī toki ni, kangaete iru.
(English translation cannot be provided because of the ungrammaticality of the original sentence).

In Example 10, Danna completely rejected the sentence GT suggested in Draft 3 and kept her original incorrect sentence without revision even though GT's translation was a well-formed sentence.

Research Question 2

The second research question is: Do learners with various language proficiency levels have different perceptions of using MT for editing? Alex and Bella (Advanced-Mid level), Cara (Intermediate-High level), and Danna (Novice-High level) expressed their opinions in their reflection papers regarding the benefits, challenges, strategies, and future use of MT use for revision.

Alex's Perception

In the reflection paper, Alex mentioned two benefits of MT use for editing. First, GT helped him develop words that he could not think of since he only processes limited Japanese

vocabulary. GT-provided vocabulary in Draft 3 probably reminded him of what he knew or suggested new wording he eventually adopted.

Second, GT helped him avoid using the same word repetitively. For example, he mentioned that he frequently used "*futsu* (normally)" in his original texts. When he translated the draft with GT, he adopted "*tsujoo* (normally)," provided by GT, to replace one "*futsu*" because "*tsujoo*" was the one that he originally intended to use but forgot.

He used his instinct to decided whether to accept or decline GT's suggestions because of his Japanese language confidence. He wrote that if "it sounded right to me in Japanese but not in English, I kept it." Whenever GT's English translations sounded unnatural to him, he took it as "the machine didn't really understand what I was trying to say" rather than double-check the Japanese sentences he wrote. In addition, he tried to use as few of GT's translations as possible because he did not want to doubt his Japanese skills.

Regarding his future use of GT, Alex commented that he would like to compose in English first and then translate that into Japanese. He explained that he would use dictionaries when translating it into Japanese if he wrote in English first. By doing so, he would be able to learn new vocabulary and expressions.

Bella's Perception

In her reflection paper, Bella mentioned that GT helped her find appropriate words. To decide whether to accept the words GT suggested, including particles, Bella used quotation marks (" ") and a wildcard (*) in Google Search to compare those searched words with those used in her Draft 1 to find the most frequently used. For example, she likely changed "*oozei* (many)" in Draft 1 to "*ooku* (many)" in Draft 4 because there are more cases of the collocation of "*ooku no kagaisha* (many perpetrators)" (462,000 hits) than "*oozei no kagaisha* (many perpetrators)" (57,000 hits)[i].

On the other hand, she commented that it was difficult for her to decide on the most appropriate word when Google Search's results indicated both words, GT-suggested and her originals, were commonly used. For instance, it was difficult for her to decide to use "*binkan* (sensitive)" or "*sensai* (sensitive)" to describe being sensitive.

Cara's Perception

In the reflection paper, Cara claimed that she became more confident in writing a better-quality composition using GT for editing. For her, GT was helpful because GT functioned as a proofreader and a reminder. She used GT to check whether the Japanese sentences she wrote made sense, which eventually helped her build up her confidence in Japanese because, to her surprise, her original texts most of the time turned out to be comprehendible in GT. Also, GT sometimes used a structure that she had learned before but could not integrate into her first draft.

Moreover, if GT suggested a grammar structure that she decided to put into her composition, she did not merely copy the complete sentence. Instead, she tried to rewrite the sentence to include it and used GT to ensure the new one was understandable in English. Example 6 is an example of this point. Although the sentence structure and the grammar "*niyotte*" had been introduced and practiced before in class, Cara did not correctly use the sentence structure nor the grammar "*niyotte*." Thus, GT's translation in Draft 3 probably provided her an opportunity to reflect on what she should have used. Further, she also

mentioned using one of the strategies introduced in class: using GT to translate the sentences back and forth to ensure the revised sentences were correct.

The biggest challenge was the struggle of accepting or rejecting GT's suggestions. She used her existing linguistic knowledge, online dictionaries, Google Search, and HI Native, an online platform, to ask native Japanese speakers more specific questions before making a final judgment. However, she still lacked confidence when deciding whether GT's translations were context-appropriate or merely literal.

Danna's Perception

In her reflection paper, Danna commented that MT was "extremely" helpful in allowing her to "play around with language" and identify what she knew and what was challenging. She believed that "realistically using MT in writing is something all students do" because "MT is like a friend we can rely on" for learning a language.

In addition, Danna believed that writing multiple drafts allowed her to think about what she wanted to say and what she had said. She found that her ideas changed during the revision process. Perhaps this was the reason for the additional sentences in Draft 4.

In terms of strategies used for accepting or rejecting GT's suggestion, she responded that she mainly used her existing linguistics knowledge to make decisions. Although she used the cross-referencing system (i.e., GT and Yandex Translator) to confirm the meaning of sentences, she rejected the translations suggested by GT when she did not understand. Indeed, it is unclear whether Danna rejected GT's suggestions in Example 9 and Example 10 because she did not understand the sentence GT translated. However, it seems that she tried to rely on her language competency to make final decisions without being overly dependent on MT.

Her biggest concern was a moral conflict because she felt she was "cheating." She stated that "using MT feels dishonest because its [*sic*] not completely original thought, [*sic*] it is like I am using a machine to jog my memory and fill in some of the pieces I might not have remembered."

DISCUSSION

This case study, involving four Japanese learners with different proficiency levels, aimed to understand how students used and perceived MT to edit self-written texts, as manifested in a close examination of the scope and the types of revision and their reflection papers.

Similarities and Distinctions Between the Four Participants

The number of words and sentences between self-written texts (Draft 1) and revision with MT (Draft 4) remained almost the same. While Alex's and Bella's revision numbers were nearly the same, the number of words and sentences in Cara's revision increased by only 8.2% and 5.8% in Danna's revision. Also, the number of sentences was almost unchanged regardless of language proficiency.

Word-level substitutions were the most frequent revision Alex, Bella, and Cara made and the second-most frequent for Danna. No changes were found at the paragraph level between the four participants, which is in line with the findings in Lee (2020).

On the other hand, differences emerged regarding the types and scope of participants' revisions made for each sentence. The two advanced-level learners, Alex and Bella, mainly

focused on the revisions by substituting MT-suggested alternatives at the word level. Alex especially replaced words with GT-suggested alternatives for a formal writing style. Bella's revision followed the same pattern. Bella also particularly paid attention to changing particles, one of the most challenging parts for Japanese learners. While the intermediate-level learner, Cara, also primarily substituted words with the alternatives suggested by GT, she also used various strategies to rewrite her original sentences by comparing her originals with GT translations. In contrast, Danna, who had the lowest proficiency level, mostly worked on changes at the sentence level with substitution, permutation, and distribution. She avoided simply coping with GT's suggestions by using her linguistic knowledge to recompose the text.

While all four participants agreed to various extents about MT's effectiveness for language learning, differences existed between the participants regarding learner perception about MT use. Some research suggests that less proficient learners have more positive attitudes toward MT use (Garcia & Pena, 2011; Kliffer, 2005; Lee, 2020; Tsai, 2020). However, that does not appear to be the case in this study. Only Danna mentioned overdependence and academic integrity issues as negatives to using MT, perhaps explaining why she did not accept some MT suggestions.

Proficiency and MT Use

Proficiency might play a critical role in the advanced-level learners Alex's and Bella's revisions. They could control the language structure and choose appropriate words to generate meaningful sentences. They were also very confident in their language proficiency. Very few grammatical errors occurred in their Draft 1s. Thus, their focuses probably were not on whether the original sentences were understandable and meaningful but on formal writing style as seen in Alex and Bella and the accuracy of particles observed in Bella.

Proficiency could also be one reason for the different results in the final drafts of the intermediate-level learner Cara and the novice-level learner Danna. Both Cara and Danna had more sentence-level revisions than Alex and Bella. However, Cara's Draft 4 revision contained more understandable and meaningful sentences than Danna's Draft 4 revision. As indicated in the reflection paper, Danna relied on her existing linguistic knowledge to decide whether to accept or reject MT's suggestions rather than completely taking those suggestions. However, her proficiency level was lower than GT's intermediate proficiency level (Ducar & Schocket, 2018). Therefore, it is possible that she had difficulty decoding sentences and could not choose appropriate words or sentence structure from what MT provided. In contrast, students with a higher proficiency level, such as Cara, could adapt the sentence structure provided by GT and reorganized her original sentence to generate a well-formed new sentence, as discussed in Khaldieh (2000) and Kormos (2012). Thus, the results indicate that language proficiency might be vital in whether learners can recompose grammatical sentences with MT's help.

It is worth noting that Danna raised a critical issue in incorporating MT into language learning: how to assess students' MT use. Many research papers concluded their analyses of the effectiveness of MT in language teaching and learning by comparing the quality change of students' self-written drafts after editing with MT (Garcia & Pena, 2011, Lee 2020, Tsai, 2019, 2020). If Danna accepted all the translations from GT and presented them as her final draft, how would her instructor evaluate the effectiveness of GT for her? How do we know MT actually facilitated her language learning? As Chun et al. (2016) point out, language educators

should be aware that assessment of student learning should focus on the process of meaning-making and learning with the technology rather than a set of post-test scores.

Implications

The results suggest that preparing students with strategies to accept or reject MT's translation of their self-written texts is essential. First, it is helpful to remind students with lower proficiency levels to create MT-friendly sentences. Students, such as Danna, who had a lower proficiency level, might get lost in translations provided by MT if their original sentences are confusing or poorly written. Writing a more straightforward sentence in L1 might help MT produce sentences for students with lower proficiency levels which are easier to comprehend. Bowker and Ciro (2019) propose the following guidelines for translation-friendly writing so that MT can make accurate, precise, consistent translations:

- Use short sentences
- Use the active voice rather than the passive voice
- Avoid long noun strings or modifier stacks
- Use relative pronouns such as "that" and "which"
- Avoid wordiness
- Use nouns instead of person pronouns
- Use terminology consistently
- Choose unambiguous words
- Avoid abbreviated forms
- Avoid idiomatic expression, humor, and cultural references

Second, Alex and Bella apparently used quotation marks (" ") and a wildcard (*) in Google Search for their revisions. Thus, Google Search as an online corpus appears to help students solve linguistic issues during editing and raise linguistic awareness. Doing so also promotes student independence and self-monitoring through problem-solving activities (Ogino, 2014; Römer, 2011; Yoon, 2008; Yoon & Hirvela, 2004).

Last, this study shows that the participants might locally target the meaning of individual words or sentences when using MT to edit. While participants could reorganize their thoughts and develop new ideas using MT during the revision process, they probably focused on accepting or rejecting and partially revising original or suggested sentences. Suppose the global or discourse aspects of writing are concerned. In that case, there is a need to include teacher-student meetings or peer responses to ensure that global issues are addressed after independent consultation with MT.

CONCLUSION

The present research aimed to examine the relationship between language proficiency level and MT use for editing. This study has shown that four participants with different language proficiency levels use MT differently. Alex and Bella, more proficient learners, tended to make changes at the word level by substituting original vocabulary with the vocabulary MT suggested.

Cara, an intermediate-level student, expanded her revisions from the word level to the sentence level. She actively used various resources, including her linguistic knowledge, dictionary, Google Search, and Japanese native speakers, to decide whether and how to accept or reject MT's suggestions. Danna, a novice-level student, primarily revised at the sentence level. Also, all learners possess positive attitudes toward MT use, while only Danna, the learner with the lowest proficiency level, had concerns about overdependence and academic dishonesty.

This case study has only four participants chosen based on their full engagement with the reflection. Therefore, they might not represent the norm among the students. Thus, we cannot conclusively generalize from the limited number of selected participants to general populations. Further, the present study researcher was also the class instructor, which might have influenced participant responses and interpretation of the data. Also, in this study, Danna used two MTs for editing while the other three only used GT. Therefore, this study could not discuss whether and how different MT affects student use of MT. Exploring this point would be interesting.

Moreover, this study primarily compared students' self-written texts and their revised texts without observing the editing process with MT. New insights about L2 learners' difficulties while using MT for editing might be revealed using other research methods such as screen capture or think-aloud protocols. Also, while this study has shown what students do with MT, it could not explain why. Post-task interviews might give us a better understanding of students' interactions with MT (Fischer, 2007).

Notwithstanding the limited sample, the findings shed new light on MT as a pedagogical tool for language teaching and learning. This study demonstrated that not all students use MT the same way and that MT does not work well for all students. As students' needs and learning histories become divergent in upper-level language classes, educators must consider how to meet student needs at various levels, including those in the same course who are presumed to have roughly the same level of L2 ability. Educators need to consider learners' language proficiency levels in incorporating MT into classroom instruction to ensure more effective language teaching and learning.

NOTES

[1] The numbers are based on a search conducted on May 20, 2021.

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APPENDIX A

Instructions for Reflection Paper

Please reflect on how you used Machine Translation (MT) to complete this writing assignment.

- How did you feel about using MT to help write compositions?
- You should talk about the success and challenges in detail.
- How did you use MT?
- Did you also use other resources? How did you use it?
- What have you gained from the writing process?
- What and how did you decide to accept or reject the suggestions provided by MT?
- What was helpful?
- What kind of help do you wish you could have?
- .....

For example, if you felt MT helped you find appropriate words, please elaborate on that by providing examples, or if you thought MT did not help you organize the structure, demonstrate that with examples.

APPENDIX B

Types of Revision

Type	Example (Changes in boldface; Translated by the author)
Addition: reviser adds information	Draft 1: 他人と話すのが大切。 *Tanin to hanasu no ga taisetsu.* [It is important to talk to others.] Draft 4: **一方**他人と話すのが大切。 ***Ippō*** *tanin to hanasu no ga taisetsu.* [**On the other hand,** it is important to talk to others.]
Deletion: reviser deletes information	Draft 1: **例えば**ある SNS で書かれるステータスで人の名前を書かずに悪口を言いうことが一つの例。 ***Tatoeba*** *aru SNS de kaka reru sutētasu de hito no namae o kakazu ni waruguchi o iiu koto ga hitotsu no rei.* [**For example**, one example is to say bad things without writing a person's name in the status on a particular SNS.] Draft 4: ある SNS で書かれるステータスで人の名前を書かずに悪口を言いうことが一つの例。 *Aru SNS de kaka reru sutētasu de hito no namae o kakazu ni waruguchi o iiu koto ga hitotsu no rei.* [One example is to say bad things without writing a person's name in the status on a particular SNS.]
Substitution: reviser substitutes information	Draft 1: **去年**の九月に 12 歳の少女が自殺した。 ***Kyonen*** *no kugatsu ni 12-sai no shōjo ga jisatsu shita.* [A 12-year-old girl committed suicide **last** September.] Draft 4: 12 歳の少女が**昨年**の九月に自殺した。 *12-Sai no shōjo ga* ***sakunen*** *no kugatsu ni jisatsu shita.* [A 12-year-old girl committed suicide **last** September.]
Permutation: reviser rephrases information	Draft 1: 世界にいじめは複雑なトピックが**ネットいじめはもっと複雑の原因ことだ。** *Sekai ni ijime wa fukuzatsuna topikku ga* ***netto ijime wa motto fukuzatsu no gen'in kotoda.*** [Bullying in the world is a complex topic and **cyberbullying is a more complex reason.]** Draft 4: 世界的のいじめは複雑なトピックであり、**ネットいじめはさらに複雑だ。** *Sekaiteki no ijime wa fukuzatsuna topikkudeari,* ***netto ijime wa sarani fukuzatsuda.*** [Global bullying is a complex topic and **cyberbullying is even more complex.]**

Distribution: reviser rewrites same information in larger chunks	Draft 1: **最後に話したいのはネットいじめへの対策。** ***Saigo ni hanashitai no wa netto ijime e no taisaku.*** **[The last thing I want to talk about is measures against cyberbullying.]** Draft 4: **最後にネットいじめの対策についてお話したいと思います。** ***Saigo ni, netto ijime no taisaku ni tsuite ohanashi shitai to omoimasu.*** **[Finally, I would like to talk about measures against cyberbullying.]**
Consolidation: reviser puts separate information together	Draft1: スナップチャット、フェースブック、インスタグラムなどの SNS でストーリーを乗せる***機能がある。***そのストーリーでは何でも書くことができるし、普通時間で消えるのが一つの特徴なのだ。 *Sunappuchatto, fēsubukku, insutaguramu nado no SNS de sutōrī o noseru* ***kinō ga aru.*** *Sono sutōrīde wa nani demo kaku koto ga dekirushi, futsū jikan de kieru no ga hitotsu no tokuchōna noda.* [There is a function to put a story on SNS such as Snapchat, Facebook, Instagram. You can write anything in the story, and one of the features is that it disappears in normal time.] Draft 4: スナップチャット、フェースブック、インスタグラムなどの SNS でストーリーを乗せる**機能があって**そのストーリーでは何でも書くことができるし、通常時間で消えるのが一つの特徴なのだ。 *Sunappuchatto, fēsubukku, insutaguramu nado no SNS de sutōrī o noseru* ***kinō ga atte*** *sono sutōrīde wa nani demo kaku koto ga dekirushi, tsūjō jikan de kieru no ga hitotsu no tokuchōna noda.* [There is a function to put a story on SNS such as Snapchat, Facebook, Instagram, etc. You can write anything in that story, and one of the features is that it disappears in normal time.]
Re-order: reviser moves information	Draft 1: **去年の九月に** 12 歳の少女が自殺した。 ***Kyonen no kugatsu ni*** *12-sai no shōjo ga jisatsu shita.* [A 12-year-old girl committed suicide **last September**.] Draft 4: 12 歳の少女が**昨年の九月に**自殺した。 *12-Sai no shōjo ga* ***sakunen no kugatsu*** *ni jisatsu shita.* [A 12-year-old girl committed suicide **last September**.]

APPENDIX C

Scope of Revision

Scope	Example (Changes in boldface; Translated by the author)
Symbol, etc.	Draft 1: パワーコンプレックスを始める場合は、被害者は「defeatist」というになる。 *Pawākonpurekkusu o hajimeru baai wa, higaisha wa 'defeatist' to iu ni naru.* [When starting a power complex, the victim will become a "defeatist."] Draft 4: パワーコンプレックスを開始すると、被害者は **"**defeatist**"** というになる。 *Pawākonpurekkusu o kaishi suru to, higaisha wa" defeatist" to iu ni naru.* [When you start the power complex, the victim will become a "defeatist."]
Word	Draft 1: **去年**の九月に 12 歳の少女が自殺した。 ***Kyonen*** *no kugatsu ni 12-sai no shōjo ga jisatsu shita.* [A 12-year-old girl committed suicide **last** September.] Draft 4: 12 歳の少女が**昨年**の九月に自殺した。 *12-Sai no shōjo ga* ***sakunen*** *no kugatsu ni jisatsu shita.* [A 12-year-old girl committed suicide **last** September.]
Phrase	Draft 1: 他にもあるポストの最後に悪口を書いて**限られた人**しか見ないことも多い。 *Hoka ni mo aru posuto no saigo ni waruguchi o kaite* ***kagira reta hito*** *shika minai koto mo ōi.* [There are many cases where people write bad words at the end of other posts that only a few people can see.] Draft 4: 他にもあるポストの最後に悪口を書いて**ごく一部の人**しか見ないことも多い。 *Hoka ni mo aru posuto no saigo ni waruguchi o kaite* ***goku ichibu no hito*** *shika minai koto mo ōi.* [There are many cases where people write bad words at the end of other posts that only a few people can see.]
Clause	Draft 1: **誰かのことについて**うわさを広がったり、自殺するように言ったりする。 ***Dareka ni kansuru*** *uwasa o hirome tari, jisatsu suru yō ni ittari suru.* Spread rumors **about someone** or tell them to commit suicide. Draft 4: **誰かに関する**うわさを広めたり、自殺するように言ったりする。 ***Dareka ni kansuru*** *uwasa o hirome tari, jisatsu suru yō ni ittari suru.* [Spread rumors **about someone** or tell them to commit suicide.]

Sentence	Draft 1: その上、その方法は様々なアプリでもできる。 *Sono Ue, sono hōhō wa samazamana apuri demo dekiru.* What's more, the method can be done with various apps. Draft 4: **さらに、人々はさまざまなアプリでそのようなメッセージを送信します。** ***Sarani, hitobito wa samazamana apuri de sono yōna messēji o sōshin shimasu.*** [In addition, people send such messages in various apps.]
Paragraph	No changes found