Graduate STEM Student Perspectives and Implementation of Machine Translators in South Korea

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Article Info	Abstract
	As technology advances, and more students have constant access to cell phones, laptops and tablets inside the classroom, the use of machine translation (MT) by language learners will continue to rise. Therefore, in order for instructors to better design courses they should strive to understand how students are using machine translation, as well as student attitudes towards this technology. This present study examined the perspectives of South Korean graduate students at a science and technology university towards the usage of MT in relation to academic settings. This study featured a survey of 100 participants, and found positive correlations between the use of translators on written assignments, important academic work such as theses, as well as a proclivity to use machine translation to support completion of daily academic tasks. Students also showed a strong belief that MT has overall benefits as a language learning tool. As a result of this study, language teachers may consider incorporating MT education within their second language curriculum.

Introduction

With a rise in the overall quality of *machine translation* (MT), due in large part to *neural machine translation,* which uses an artificial neural network to maximize translation performance, language instructors face the challenge of adapting to the inevitable influx of MT in the classroom (Groves & Mundt, 2021; Lee, 2021; Kadhim et at, 2013; Kovacs, 2020; Wołk & Marasek, 2015). In university classrooms, where students often have access to laptops, tablets and smartphones, the question instructors face is quickly moving from whether MT should or should not be allowed in the classroom, to how instructors can successfully integrate the use of MT into their lessons.

While language instructors have always adapted to the changing technological advances in the classroom, there have historically been mixed perceptions when it comes to translation, and more recently MT in conjunction with language education. An early study by Wen and Johnson linked English learner translation with a lack of achievement (1997), however this study focused on direct translation and not MT. Initial discussion of MT often focused on the detrimental effects that technology might have in the classroom, and was often described by instructors as being counteractive with the widely accepted communicative approach to language acquisition (Jolley & Maimone, 2015, Senior, 2019).

More recent opinions surrounding MT do seem to be shifting. A study by Jolley and Maimone (2015) involving 41 instructors in a university Spanish program found that while few instructors (5.13%) believed that there was no question of ethics involving MT, the majority of instructors surveyed (82.05%) believed that the ethical usage of MT depended upon its purpose. However, only a small percentage (7.69%) of those instructors reported integrating assignments that directly involved the use of MT in the classroom. Studies have found language instructors to be skeptical of MT as a pedagogical tool, with some claiming MT to be a burden in the classroom which could lead to a decrease in language programs in the future (Clifford et al., 2013; Lee, 2021).

While some studies also imply students have mixed emotions about using MT for academic purposes (2021, Lee), most research into student perceptions of MT has been positive. Students consistently are shown to believe that MT can be beneficial when used practically in the language classroom (Alhaison & Alhaysony, 2017; Kumar, 2012; Nino, 2009; Senior, 2019), although it is unclear if students understand how to use MT as a pedagogical tool, as opposed to a crutch in language classrooms.

Some earlier student studies have looked into the use of direct translation as a pedagogical tool without focusing on MT. For example, in a study involving Taiwanese students, Hsieh (2000) believed that the use of translation assisted participants' understanding of vocabulary, and had an overall positive effect on their English learning. Several additional studies have pointed to translation having a positive influence on lower and intermediate level learners, but being more detrimental to advanced students, however these studies do not directly rely on MT (Ramachandran & Rahim, 2004; Husain, 1995; Liao, 2006).

Research into the effects of MT in the classroom is still in its infancy. Students have more access to technology in the classroom than ever before, and while many instructors see this as distracting, or in the case of MT potentially disturbing to the learning process, some research shows that even mobile devices have a measurable ability to assist learning (Wu, 2014; Jiugen, Ruonan & Wenting, 2014). Of course this research has not looked directly into the effects of MT, but rather how instructors can utilize a wide range of new technology inside classrooms with practical benefits. Nevertheless, several of these studies have shown that MT specifically can be successfully implemented into the classroom; however, most studies into MT as a pedagogical tool only focus on the use of MT in relation to writing activities and improvement (Brenda, 2013; Cancino & Panes, 2021; Ducar & Schocket, 2018; Groves & Mundt, 2015; Lee, 2021).

In higher education, it is becoming more common for students to produce research in their non-dominant language. This can be seen in the abundance of English language published research in scientific fields, as well as the growing number of university programs taught through the medium of English, despite being in countries where English is not the official language (Bowker & Ciro, 2019). It has been estimated that over three-quarters of scientific papers are published in English, with some fields of study being closer to ninety-percent English (Montgomery, 2013). Students who are studying in their L2 are likely to rely upon MT as a means of assistance (Groves & Mundt, 2021) however, the degree to which students rely upon this technology, as well as the quality of the work produced using MT is still being researched. A recent study by O'brien et al. (2018) looked at the quality of abstracts written partly without MT, and written partly in the student's L1 and directly translated into

English. They found that with proper revision and the use of grammar-checking applications that MT did not negatively impact the quality of the abstract writing. The participants were later surveyed, and there were mixed opinions about whether it was easier to translate and review the writing, or write directly in English. What is clear is that whether students are being instructed to or not, they have access to and are using MT not only for their language courses but other academic purposes.

Bowker & Ciro (2019) suggest that students need to be trained in how to use MT in order to fully realize the benefits. A pilot workshop by Bowker (2020) involving 22 undergraduate Chinese students at a university in Ottawa, Canada, looked to directly train students in MT usage. This workshop discussed topics such as academic integrity and awareness of different MT tasks. Students in this workshop felt confident in their ability to improve the way they use MT for different tasks, and responded that they would recommend this course to students, however, it is still unclear whether the students had long term success in improving the way they utilize MT for academic purposes. In order to better assist students, it is imperative to understand how–students are currently making use of available MT. Currently, few studies have looked into how students are using MT without instructor guidance, and how students perceive this technology in a pedagogical sense.

Rather than focus on the effects of MT on second language acquisition, this study attempts to evaluate students' perception of MT as a tool within and outside of academic environments for various writing and reading tasks. Thus, we employed a Likert style survey delivered to 100 graduate students in science, technology, engineering and mathematics (STEM) fields. Participant answers were used to gauge how students are currently utilizing MT inside their classrooms, laboratories and when engaging in the academic world, as well as their perspectives as to how MT contributes or takes away from their language learning. Senior (2019) believes that students see the benefits of MT and will therefore continue using them, and that it is up to language instructors to augment and enhance the practices that are already common among our students. While some research reveals benefits of MT, in order to fully realize the positive aspects in the classroom, it is necessary to understand our students' perceptions of MT and how they currently are utilizing this technology. As stated earlier, professors often have negative connotations with the use of this technology in the classroom, which might affect the way students use MT towards assignments. Furthering our understanding of student perceptions might help instructors create better classroom practices that make practical use of this ever present technology.

Research Questions

Our project looks to answer the following questions:

> 1. To what extent are Korean graduate students who are enrolled in English courses at a science and technology university using machine translators in class and for work or academic purposes outside of class?
> 2. To what extent are Korean graduate students who are enrolled in English courses at a science and technology university using machine translators for writing, reading, with the perception of English improvement?

3. How do Korean graduate students, who are enrolled in English courses at a science and technology university, perceive the use of machine translators in terms of usefulness and acceptability?

4. How are Korean graduate students inputting their L1 into MT for L2 writing production and reading purposes?

Methods

For an increased understanding of Korean STEM graduate students' use of online translators, a mass announcement for participation in a survey was sent to students of G University in South Korea. One hundred of these students completed the survey. Participants were notified that their answers would be anonymous in order to promote authentic responses. All participants are conducting research in STEM laboratories that are partially integrated with international professors as well as international students. In this context, students may also use translators for communication purposes outside of explicit class work. These students are expected to not only write and publish research and thesis papers but also regularly communicate with foreign professors and peers in English. Not only is English incorporated within laboratories, but all courses at G University are expected to be provided in English. Thus, specific tasks were included in the questionnaire to offer an overview of the conditions and behaviors in which MT may be used within these environments.

This questionnaire incorporated two types of quantitative 5 point Likert scale questions (frequency and agreement types). The first section was composed of frequency Likert questions on translator use where selection of 1 corresponded to "Never", 2 to "Rarely", 3 to "Sometimes", 4 to "Often" and 5 to "Always". These questions were modeled after O'Neil's (2019) questionnaire which focused on two contexts of use, ungraded and graded work. However, to better accommodate the wider range of research work performed by Korean STEM graduate students, additional task-based questions for outside of class work were added:

- I use translators when reading or writing emails to/from professors, colleagues, or classmates.
- I use translators when writing/completing work outside of the classroom.
- I use translators/plan to use translators when writing my thesis paper.

Following the task-based questions are ten 5 point Likert scale frequency questions focused on MT literacy and the input methods the participants adopt while using MT for the specific skills of reading and writing English texts. The methods include inputting a word, a sentence, a paragraph, a whole text at a time, writing L1 directly into the MT, and finally copying a completed L1 text and pasting into an MT. Answer selections range from 1 corresponding to "Never", 2 to "Rarely", 3 to "Sometimes", 4 to "Often" and 5 to "Always".

The final section of questions were agreement Likert questions on the preferred context and usefulness of translators. In this set, participants were asked to answer 1 if they "Strongly Disagree", 2 if "Disagree", 3 if "Neutral", 4 if "Agree" and 5 if they "Strongly Agree". The first seven questions of this set focus on what type of classwork students would use translators for: for example, "Translators should be allowed when taking exams in non-English courses (such as math, science, etc.)." The last four questions ask students how useful they perceive translators to be.

- Translators help me complete tasks more quickly
- Using translators requires more time to complete tasks
- Translators help me to learn English
- Translators hinder learning English.

All questions and answer choices for the two sections were provided bilingually in both English and Korean.

Results

Participants' Environments and Conditions for Using Online Machine Translators

As discussed above, the survey was divided into two sections. Per O'neil's research, responses of "always, often, and sometimes" were considered positive responses and "never or rarely" as negative responses (O'neil, 2019). The first section of the survey focused on the specific conditions and tasks in which Korean STEM graduate students may be actively using MT.

From the first section, five questions had definitively positive responses which can be seen in Table 1. According to the results, 66% of participants reported using MTs when writing or completing work outside of the classroom. When asked about specific tasks common among STEM graduate students, 75% responded positively to using MT when doing work for their labs and 79% for thesis writing. When asked about use of MT within a classroom, tasks were divided into graded and ungraded assignments. Participants reported using MT for graded work slightly more often with positive responses of 74% compared to 64% for ungraded work.

Table 1. Self-reported Frequency of Use of Machine Translation in Certain Environments and Conditions

	Never	Rarely	Sometimes	Often	Always
I use translators when writing/completing work outside of the classroom (such as lab, thesis writing, etc.).	12%	22%	27%	29%	10%
I use translators when doing work for my lab.	6%	19%	25%	35%	15%
I use translators/plan to use translators when writing my thesis paper.	6%	11%	17%	37%	25%
I use translators when writing/completing graded assignments for classes.	7%	19%	22%	35%	17%
I use translators when writing/completing ungraded assignments for classes.	13%	23%	22%	27%	15%

Figure 1 displays the results of participant responses ' concerning the use of MT for general work outside the classroom. Figure 2 shows the positive response percentages, from 96 participants, on several tasks done outside the classroom. In both figures, a majority of participants positively responded to the use of MT on several tasks, common among STEM students, both in and out of the classroom setting.
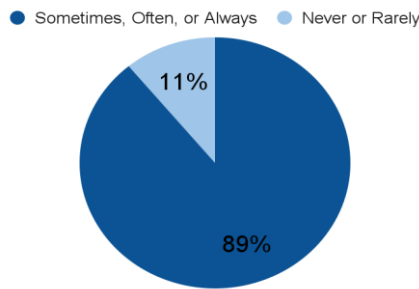
Figure 1. Self-Reported Use of Translators on Work Outside the Classroom *(thesis, lab reports,etc.)*
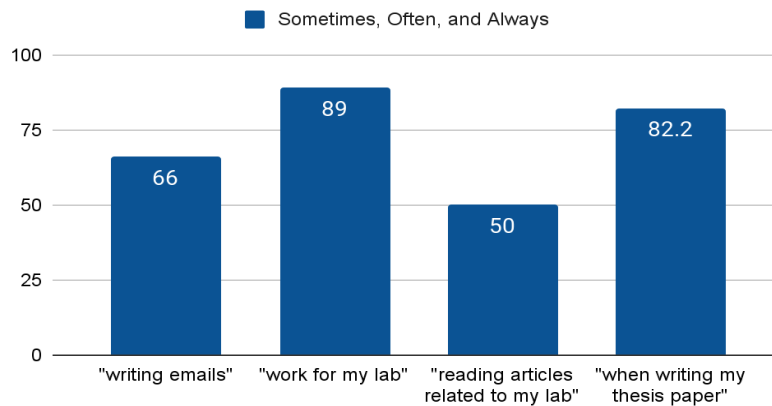

Figure 2. Percents of Self-Reported Positive Responses for the Use of Translators on Several Tasks outside the Classroom

It was hypothesized that there could be differences in the perception of MT usage when completing either graded or ungraded assignments. Figure 3 shows that there is a difference of 10% between these conditions, and that participants were only slightly more likely to use MT for writing and completing graded assignments for classes. Notably, a majority of self-reported responses were positive in both conditions.
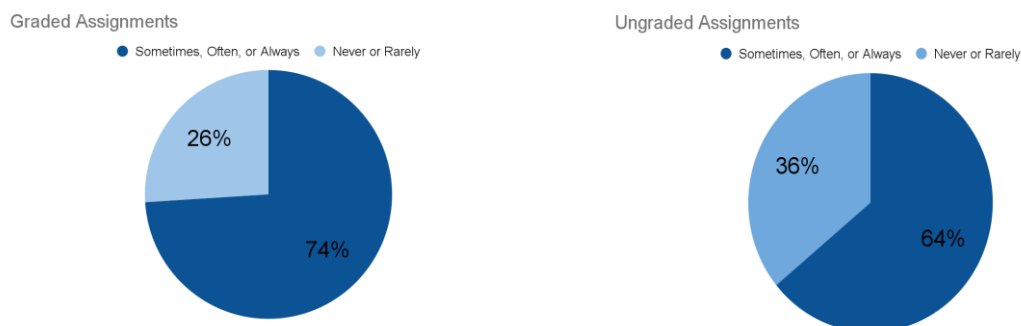
Figure 3. Comparison of Participants Self-Reported Use of Translators on Graded and Ungraded Assignments

Techniques of Inputting Text into Machine Translators

The second set of questions in the first section asked about techniques in which participants input text for MT when reading and writing English-language texts. Four questions focused on writing, four questions focused on reading, and two questions focused on the students' input method when using the participants' first language.

The results of the eight questions regarding writing and reading can be seen in Figure 4, showing a comparison of positive responses. For both writing and reading, participants reported translating sentences at a time with positive results of 67% and 53% respectively. Thus, participants indicated that they are likely to use MT to translate a sentence at a time, rather than single words, paragraphs, or whole texts while both reading and writing in English.

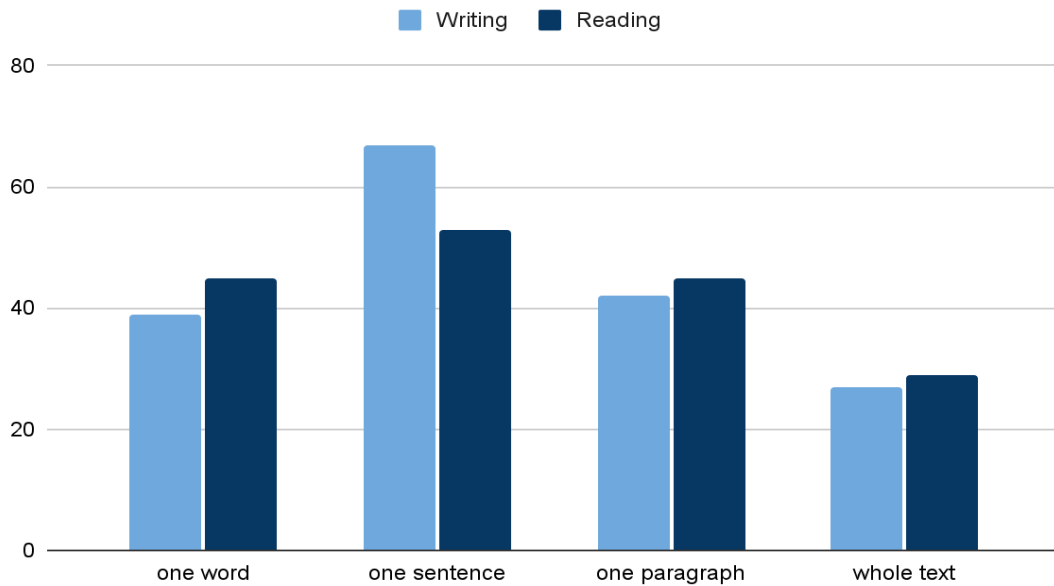Figure 4. Comparison Of Positive Results of Self-Reported Techniques When Using Machine Translators for English Papers and English-Language Text

Out of the eight questions, four questions had greater differences between positive and negative responses. Participants reported that they are much less likely to use a MT to only translate one word at a time compared to translating one sentence with 61% negative and 67% positive responses respectively. Also, 73% of participants responded that they usually do not translate a whole text at a time. However, three out of the four questions related to using MT while reading English-language texts had similar positive and negative results. One question, which asked if participants used MT to translate a whole text when reading, had a heavily negative result of 71%.

Table 2. Self-Reported Techniques When Using Machine Translators

	Never	Rarely	Sometimes	Often	Always
When using a translator for *writing* English papers, I only translate <u>one word</u> at a time.	35%	26%	18%	16%	5%
When using a translator for *writing* English papers, I only translate <u>one sentence</u> at a time.	9%	24%	20%	35%	12%
When using a translator for *writing* English papers, I translate the <u>whole text</u> at a time.	56%	17%	11%	12%	4%
When using a translator for *reading* English-language text, I translate the <u>whole text</u> at a time.	46%	25%	17%	8%	4%

Participants' perceptions of machine translators

The second section of the survey focused on the perception of MT in regards to usage and language learning. Similar to the first section, "agree" and "strongly agree" were considered positive responses while "strongly disagree" and "disagree" were considered negative. Table 3 shows the results of survey questions aimed at measuring participants' perception of using MT for English and non-English courses and graded or ungraded evaluations. Participants revealed strong preferences in the questions seen below.

Overall, 80% of participants positively responded that MT should be allowed for graded work and when writing papers in non-English courses. Also, 79% of participants believe MT helped them to complete tasks more quickly. Furthermore, 62% of participants responded negatively to the idea that MT requires more task time. In regards to English education, 59% of participants seem to believe that MT has a positive effect on language acquisition and does not hinder learning.

Table 3. Participants' Self-Reported Perceptions of Using Machine Translators in Class

	Strongly Disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5
Translators should be allowed when preparing for graded work in a non-English course (such as math, science, etc.).	1%	1%	18%	52%	28%
Translators should be allowed when writing papers in non-English courses (such as math, science, etc.).	2%	0%	18%	54%	26%
Translators help me complete tasks more quickly.	1%	5%	15%	44%	35%
Using translators requires more time to complete tasks.	26%	36%	22%	10%	6%
Translators help me learn English.	2%	8%	31%	37%	22%
Translators hinder learning English.	25%	34%	29%	9%	3%

In consideration of non-English courses, Figure 5 shows the perception of using MT on certain course tasks. 80% of participants positively responded that MT should be allowed for both graded work and writing papers. 18% of participants felt "neutral", while only 2% negatively responded to using MT on these tasks. In language acquisition settings, one growing factor that impacts our approach to instruction is how the use of MT may relate to language learning (Bowker & Ciro, 2019). Figure 6 shows that participants feel that MT has a positive influence on language learning, with 59% responding positively to questions about whether usage helps language learning. This is also reflected in the inverse question that MT hinders learning English, with an equal number of negative responses at 59%.
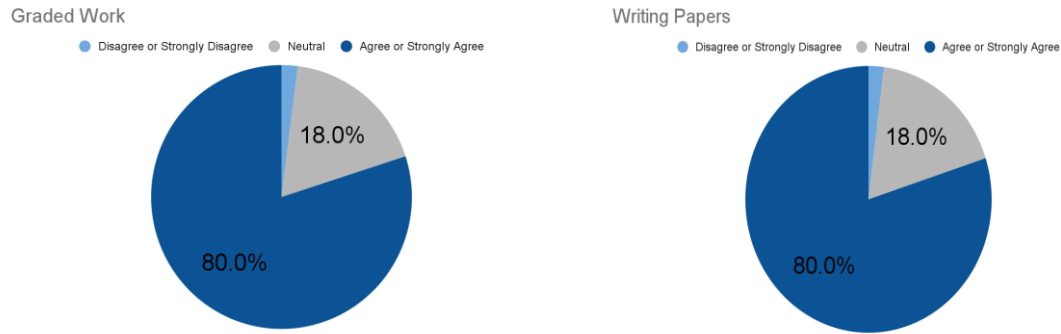
Figure 5. Comparison of Participants' Self-Reported Perceptions of Translators Being Allowed on Certain Tasks in Non-English Subject Courses *(such as math, science, etc.)*
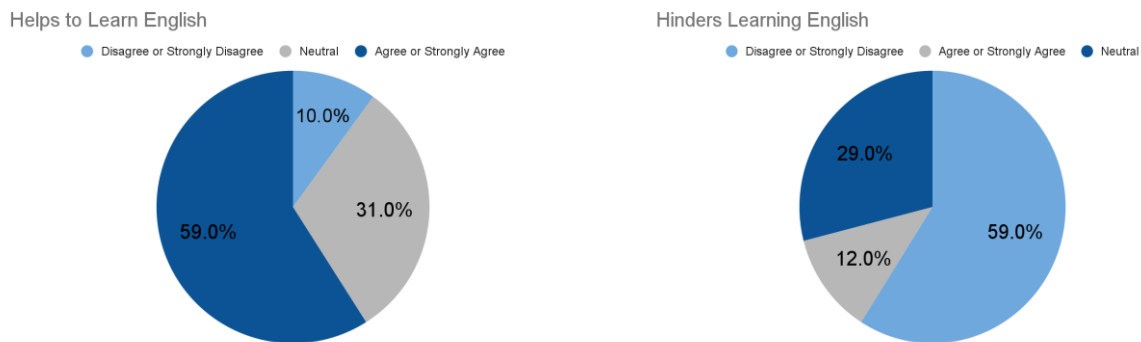

Figure 6. Comparison of Self-Reported Perceptions of Translators' Influence on Learning English

Discussion

With the goal of gaining insight on an English-language learner's perspective, this survey attempted to gauge MT usage in students' general academic careers. Based on our survey results, Korean STEM graduate students' positive preferences for using MT appears to expand outside of typical course contexts. The survey question with the highest positive response rate was in relation to the use of MT when writing and completing work outside of the classroom. For this question, 89 out of 100 participants claim to use MT in their labs, when writing a thesis or other related works. This is a higher response rate than questions regarding reading or completing assignments, both graded and ungraded, for classes. At G University, graduate students have additional English requirements including reading research articles, writing lab reports and theses, as well as emailing international colleagues and professors. In these additional contexts, a large majority of surveyed students use MT to perform the aforementioned communicative activities. Although English language educators may or may not agree with the use of MT in the classroom, the reality is that language learners are actively using such technology in tasks outside of classroom education.

When given the opportunity, participants seem to prefer to use MT for assignments in their courses. The majority of participants reported using MT for ungraded and graded assignments to a nearly identical degree. Thus, it seems

that the use of MT is inherently embedded within a student's writing process regardless of how the writing will be evaluated. When asked specifically about the use of MT in English courses, 67% of participants approved of usage on graded work while 61% also agreed that MT should be allowed when writing papers. In comparison, outside of the English classroom, 80% of participants agree with the use of MT on graded work and writing for non-English classes. This shows that Korean STEM graduate students consider English and non-English courses differently, with a stronger belief that MT is more acceptable in non-language focused classes regardless of the classwork being graded or ungraded. However, the use of MT is still acceptable by the majority of participants for graded coursework in English courses.

Additional trends were found in the way that participants use MT. For writing tasks, students' preferences trend towards typing full sentences directly into the translator window. Thus, these translators are not being used as dictionaries or even for whole text translation. Instead, the translators seem to be used for assistance in writing sentences. When properly edited, translating language at the sentence level is an example of proper MT literacy, and shows that students are not translating excessive amounts of text at one time (Bowker & Ciro, 2019). A majority of participants' responses from our survey (59%) support this notion of MT as a helpful learning tool which has also been supported in prior studies (Alhaison & Alhaysony, 2017; Kumar, 2012; Nino, 2009; Senior, 2019). From an educational perspective, instructors may be unsatisfied with students not attempting to first create English sentences on their own. However, as the quality and pervasiveness of MT continues to rise, student use of MT in this fashion may become unavoidable. Thus, further research into students' needs and their perception of the accuracy of MT could help instructors to better understand the reasons for directly typing sentences into machine translators, as well as assist in developing assignments and activities that encourage students to use MT in an academically beneficial manner. The question then arises as to the necessity of guiding and educating students to the proper techniques and strategies when using MT. Students should be aware of both the advantages and limitations of relying on technology in their academic tasks. Furthermore, considering that language learners are already using MT as a tool, educators may consider covering MT in their curriculum in order to improve their students' MT literacy.

Conclusions

This study represents one glimpse into the attitudes of students towards MT, and does not look to make conclusions about all students based on the findings. Our participants represent Korean graduate students in strictly STEM fields, and it is possible that students from different age ranges and different language backgrounds might feel differently. It is also possible that Liberal Arts majors might reveal different attitudes given similar survey questions. Additionally, our study was limited to 100 participants due to operational constraints. Future studies would benefit from a larger and more broad pool of participants, especially second language learners who are working towards their MA or PhD. in a wider range of fields of study.

Despite previous negative connotations surrounding MT, our research reveals that MT is viewed as a benefit by students, and that fighting the use of this technology could be ineffective for instructors going forward. Students are aware of the practical advantages of using MT in and outside the classroom, and will continue to utilize the

technological tools available to them. It is the responsibility of instructors to provide guidance and instruction on MT use, and urge students to employ MT to their advantage as language learners and not merely to exploit the ease of instant translation during learning opportunities.

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Appendix A. Survey

GIST Graduate Student Translator Survey					
This is a survey about the usage of translators (ie: Google Translate, Papago, Naver Dictionary, etc.) at GIST by graduate students. Be aware this survey is completely anonymous and will in no way affect your grade or any work you do at GIST.					
본 설문조사는 GIST 대학원생들의 번역기(구글번역, 파파고,네이버 사전 등) 사용에 관한것입니다. 이 설문조사는 완전히 익명으로 처리되며 설문 참가자가 GIST에서 수행하고 있는 업무나 성적에 어떠한 영향도 미치지 않습니다.					
Section 1					
Please answer using the following scale:	Never 전혀	Rarely 드물게	Sometimes 가끔	Often 자주	Always 항상
I use translators when reading or writing emails to/from professors, colleagues, or classmates. 저는 교수, 동료, 동기들과 이메일을 주고 받을때 번역기를 사용합니다.	Never 전혀	Rarely 드물게	Sometimes 가끔	Often 자주	Always 항상
I use translators when writing/completing work outside of the classroom (such as lab, thesis writing, etc). 저는 교실 밖에서 영어가 필요한 업무나 작업을 할 경우 번역기를 사용합니다.(예: 실험실, 논문작성 등)	Never 전혀	Rarely 드물게	Sometimes 가끔	Often 자주	Always 항상
I use translators when doing work for my lab. 저는 연구실에서 일할 때 번역기를 사용합니다.	Never 전혀	Rarely 드물게	Sometimes 가끔	Often 자주	Always 항상
I use translators when reading articles related to my lab. 저는 연구실과 관련된 기사를 읽을 때 번역기를 사용합니다.	Never 전혀	Rarely 드물게	Sometimes 가끔	Often 자주	Always 항상
I use translators/plan to use translators when writing my thesis paper. (may not apply). 저는 논문을 작성할 때 번역기를 사용하거나, 사용할 계획입니다. (해당 사항이 없는 경우 무응답)	Never 전혀	Rarely 드물게	Sometimes 가끔	Often 자주	Always 항상

I use translators when taking notes or preparing for classes. 저는 수업을 준비하거나,필기할 때 번역기를 사용합니다.	Never 전혀	Rarely 드물게	Sometimes 가끔	Often 자주	Always 항상
I use translators when reading instructions or content for classes. 저는 수업과 관련된 지침이나 내용을 읽을 때 번역기를 사용합니다.	Never 전혀	Rarely 드물게	Sometimes 가끔	Often 자주	Always 항상
I use translators when reading articles related to my classes. 저는 수업과 관련된 기사를 읽을 때 번역기를 사용합니다.	Never 전혀	Rarely 드물게	Sometimes 가끔	Often 자주	Always 항상
I use translators when writing/completing ungraded assignments for classes. 저는 수업에서 성적에 반영되지 않는 과제를 수행할 때 번역기를 사용합니다.	Never 전혀	Rarely 드물게	Sometimes 가끔	Often 자주	Always 항상
I use translators when writing/completing graded assignments for classes. 저는 수업에서 성적에 반영되는 과제를 수행할 때 번역기를 사용합니다.	Never 전혀	Rarely 드물게	Sometimes 가끔	Often 자주	Always 항상
When using a translator for writing English papers, I only translate one word at a time. 영문으로 에세이나 과제를 작성하기 위해 번역기를 사용할 때는, 한 번에 한 단어씩 입력하여 번역합니다.	Never 전혀	Rarely 드물게	Sometimes 가끔	Often 자주	Always 항상
When using a translator for writing English papers, I only translate one sentence at a time. 영문으로 에세이나 과제를 작성하기 위해 번역기를 사용할 때는, 한 번에 한 문장씩 입력하여 번역합니다.	Never 전혀	Rarely 드물게	Sometimes 가끔	Often 자주	Always 항상
When using a translator for writing English papers, I translate one paragraph at a time. 영문으로 에세이나 과제를 작성하기 위해 번역기를 사용할 때는, 한 번에 한 단락씩 입력하여 번역합니다.	Never 전혀	Rarely 드물게	Sometimes 가끔	Often 자주	Always 항상
When using a translator for writing English papers, I translate the whole text at a time. 영문으로 에세이나 과제를 작성하기	Never 전혀	Rarely 드물게	Sometimes 가끔	Often 자주	Always 항상

위해 번역기를 사용할 때는, 본문 전체 텍스트를 한꺼번에 입력하여 번역합니다.					
When using a translator for reading English-language text, I only translate one word at a time. 영문 텍스트를 읽기 위해 번역기를 이용하는 경우, 한 번에 한 단어씩 입력하여 번역합니다.	Never 전혀	Rarely 드물게	Sometimes 가끔	Often 자주	Always 항상
When using a translator for reading English-language text, I only translate one sentence at a time. 영문 텍스트를 읽기 위해 번역기를 이용하는 경우, 한 번에 한 문장씩 입력하여 번역합니다.	Never 전혀	Rarely 드물게	Sometimes 가끔	Often 자주	Always 항상
When using a translator for reading English-language text, I translate one paragraph at a time. 영문 텍스트를 읽기 위해 번역기를 이용하는 경우, 한 번에 한 단락씩 입력하여 번역합니다.	Never 전혀	Rarely 드물게	Sometimes 가끔	Often 자주	Always 항상
When using a translator for reading English-language text, I translate the whole text at a time. 영문 텍스트를 읽기 위해 번역기를 이용하는 경우, 전체 텍스트를 한꺼번에 입력하여 번역합니다.	Never 전혀	Rarely 드물게	Sometimes 가끔	Often 자주	Always 항상
I write Korean directly into the translator. 저는 번역기에 바로 한국어를 씁니다.	Never 전혀	Rarely 드물게	Sometimes 가끔	Often 자주	Always 항상
After I finish writing in Korean, I copy and paste everything into a translator. 저는 먼저 한국어로 글을 완성한 후, 모든 것을 복사해서 번역기에 붙여 넣습니다.	Never 전혀	Rarely 드물게	Sometimes 가끔	Often 자주	Always 항상
Section 2					
Please answer using the following scale:	Strongly Disagree 전적으로 동의하지 않음	Disagree 동의하지 않음	Neutral 중립적(잘 모르겠다)	Agree 동의	Strongly Agree 전적으로 동의함
Translators should be allowed during class time. 수업 중 번역기 사용은 허용되어져야 합니다.	Strongly Disagree	Disagree 동의하지 않음	Neutral 중립적(잘 모르겠다)	Agree 동의	Strongly Agree

	전적으로 동의하지 않음				전적으로 동의함
Translators should be allowed when preparing for graded work in an English course. 영어교과 과정 중 성적에 반영되는 과제를 준비할 때 번역기 사용은 허용되어야합니다.	Strongly Disagree 전적으로 동의하지 않음	Disagree 동의하지 않음	Neutral 중립적(잘 모르겠다)	Agree 동의	Strongly Agree 전적으로 동의함
Translators should be allowed when preparing for graded work in a non-English course (such as math, science, etc.). 비영어 교과목 (예: 수학,과학) 에서는 성적에 반영되는 과제를 준비할 때 번역기 사용이 허용되어야 합니다.	Strongly Disagree 전적으로 동의하지 않음	Disagree 동의하지 않음	Neutral 중립적(잘 모르겠다)	Agree 동의	Strongly Agree 전적으로 동의함
Translators should be allowed when taking exams in English courses. 영어교과 과정 중 영어 시험을 볼 때 번역기 사용은 허용되어야합니다.	Strongly Disagree 전적으로 동의하지 않음	Disagree 동의하지 않음	Neutral 중립적(잘 모르겠다)	Agree 동의	Strongly Agree 전적으로 동의함
Translators should be allowed when taking exams in non-English courses (such as math, science, etc.). 비영어 교과목 (예 : 수학, 과학 등)에서 시험을 볼 때 번역기 사용은 허용되어야합니다.	Strongly Disagree 전적으로 동의하지 않음	Disagree 동의하지 않음	Neutral 중립적(잘 모르겠다)	Agree 동의	Strongly Agree 전적으로 동의함
Translators should be allowed when writing papers in English courses. 영어교과 과정에서 에세이(과제물)를 작성할 때 번역기 사용은 허용되어야합니다.	Strongly Disagree 전적으로 동의하지 않음	Disagree 동의하지 않음	Neutral 중립적(잘 모르겠다)	Agree 동의	Strongly Agree 전적으로 동의함
Translators should be allowed when writing papers in non-English courses (such as math, science, etc.). 비영어 교과목 (예 : 수학, 과학 등)에서 에세이(과제물)를 작성할 때 번역기의 사용은 허용되어야합니다.	Strongly Disagree 전적으로 동의하지 않음	Disagree 동의하지 않음	Neutral 중립적(잘 모르겠다)	Agree 동의	Strongly Agree 전적으로 동의함
Translators help me complete tasks more quickly. 번역기는 과제를 더 빨리 완료 할 수 있도록 도와줍니다.	Strongly Disagree 전적으로 동의하지 않음	Disagree 동의하지 않음	Neutral 중립적(잘 모르겠다)	Agree 동의	Strongly Agree 전적으로 동의함

Using translators requires more time to complete / tasks. 번역기를 사용할 경우 과제를 완료하는데 더 많은 시간이 필요합니다.	Strongly Disagree 전적으로 동의하지 않음	Disagree 동의하지 않음	Neutral 중립적(잘 모르겠다)	Agree 동의	Strongly Agree 전적으로 동의함
Translators help me learn English. 번역기는 제가 영어를 배우도록 도와줍니다.	Strongly Disagree 전적으로 동의하지 않음	Disagree 동의하지 않음	Neutral 중립적(잘 모르겠다)	Agree 동의	Strongly Agree 전적으로 동의함
Translators hinder learning English. 번역기는 영어 학습에 방해가 됩니다.	Strongly Disagree 전적으로 동의하지 않음	Disagree 동의하지 않음	Neutral 중립적(잘 모르겠다)	Agree 동의	Strongly Agree 전적으로 동의함