

High School Student Use of Translation Software in Language Lessons: Surveys and Constructive Approaches

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Abstract: Particularly in second-language education, developments in translation software and increasingly widespread use cause a variety of problems, especially regarding plagiarism. Three surveys of translation software use were conducted among first-year Japanese high school students studying English, with the results posted in this research. From there, a number of activities connected to heightening awareness of the risks associated with translation software usage and education regarding responsible use were conducted in and outside class, three of which will be explained briefly. The activities described include in-class writing without the use of the internet or technology to assist, Content and Language Integrated Learning (CLIL) lessons about plagiarism, and homework assignments centered around at-home research as opposed to writing. Through all the new approaches, a positive attitude towards technology is encouraged, along with increased teacher awareness of student usage.

Key words: Software-aided translation, Google Translate, DeepL, translation, plagiarism, CLIL

1. Overview

The fact that language students use software-aided translation in writing assignments shouldn't come as a surprise to most educators, but recent developments in commonly used and easily accessible software have made student use increasingly difficult to detect, with results resembling what could be expected of students at this level (first year of high school). Student familiarity with the software is increasing and ease of use is improving. In the 2021-2022 school year, a surprising disparity was seen between the quality of student writing on homework and the quality of student writing on in-class tests for the first-year high school students surveyed. In addition to presenting student survey data, the countermeasures described explore proactive approaches to this issue without vilifying the technology itself and minimizing vilification of the students' use of it.

In the first half of the year, alongside their regular assignments, students were given surveys asking questions about the use of software-aided translation, and gradually it became clear that a considerable number of students use software when writing at-home assignments, sometimes even in class with the aid of their phones. The quality of their test answers demonstrates that the use of software may have a detrimental effect on their overall writing skills (to what degree, exactly, is a topic for further research). In high school year one English Communication class, upon comparing writing on tests where students were not allowed to use translation technology or dictionaries to writing homework quality, the possibility became clear that a large number of students may be using machine translation on their at-home assignments. While use of machine translation is not a negative practice in and of itself, student writing is meant to represent the individual progress of the student and using a translator for large parts or the entirety of a piece makes it difficult to properly evaluate student needs and progress. Additionally, based on past graduating classes, many students in the target four classes (approx. 37 students each in total, 35-36 regularly attending class, 31-34 submitting the surveys per class) are assumed to potentially attend universities abroad in the future, where use of machine translation to the degree hypothesized would easily fall within the bounds of what could be considered plagiarism. It is also worth noting that Japanese universities have begun addressing issues related to plagiarism in recent years as well (Chiba, Yomiuri).

The purpose of the surveys was to obtain a general idea of student use and awareness of machine translation, and to

assess student attitudes towards use (to aid in preparing countermeasure 1, in particular). The purposes of the special lessons and small changes to normal classroom and assignment procedures (hereafter, 'countermeasures,' described in greater detail below) were to educate students about risks associated with plagiarism, analyze and assist in student writing without the aid of technology, and provide activities that demonstrate productive and acceptable use of machine translation.

1.1. Background

As of 2022, the introduction of NMT (Neural Machine Translation) in services readily available online has resulted in increasingly natural sentence structure (here, specifically in Japanese to English translation), in essence creating writing similar to what could be expected of a Japanese ESL (English as a second language) student (late junior high school to mid-high school) with above-average grammar skills and occasional word choice mistakes, for example. This made student use of software harder to detect, especially as NMT translators produced results that were significantly different from previous translation approaches (Koehn). Google Translate, the most widely used among students, was introduced in 2006 as an SMT (statistical machine translator) (Wikipedia), and student use often resulted in sentence structure that resembled the Japanese language, with direct-translated word choices that were often inappropriate in English or not within the lexicon of what the students had been taught (within the scope of knowledge of the instructor). Different translators at this time produced slight variations (SMT, example-based machine translation (EBMT), hybrid machine translation (HMT), etc.), but was generally possible to differentiate standard student mistakes from machine translation mistakes. In 2016, Google Translate shifted to an NMT approach (Koehn), and though it took several years for use to become widespread, from an educational standpoint, it became significantly more difficult to differentiate reasonable student mistakes from Google Translate mistakes. NMT service DeepL produces similar results (DeepL). Student use of machine translation services that have yet to adopt NMT (Weblio, etc.) continues to be easily detectable.

Terminology notes: For the purposes of this research, 'machine translation,' 'software translation,' and related terms ('software-based translation,' 'machine translators,' etc.) should be considered equivalent, save where specified otherwise.

2. Student surveys

2.1. Basis and initial considerations

Alongside normal homework assignments, students were given surveys to complete with a variety of questions concerning the difficulty of the homework, how much time was spent on it, and whether the student used any kind of technology when writing at home. The basis of giving the surveys and, from here, making changes to classroom processes with behavior correction in mind is based on the understanding that plagiarism is a problem, and that the extensive use of machine translation in a language class where the student is expected to produce their own results constitutes plagiarism (Pecorari, Koehn). There is also a cultural issue of plagiarism not being treated seriously in Japan in comparison with other countries (Japan Times).

In terms of acceptable use, using machine translation in a limited capacity, similar to that of a dictionary, is acceptable on assignments. This was explained to students in countermeasure 1. Weblio (Jan 30, 2022), for example, is a popular site for Japanese to English translation, initially functioning as an online dictionary. Especially in the case of Weblio, however, students in class tend to input full sentences at least, and observing consistency over the entire assignment showed that when machine translation is used (prior to the countermeasure lesson on plagiarism, described below), students appeared to be as likely to use machine translation for large sections of text as they were to look up single words.

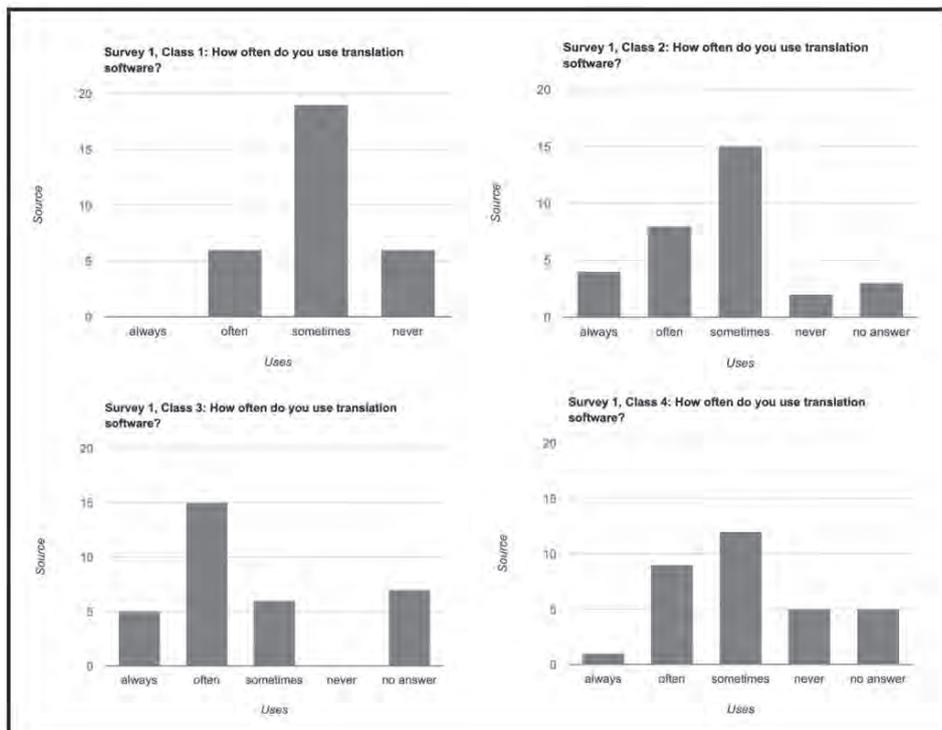
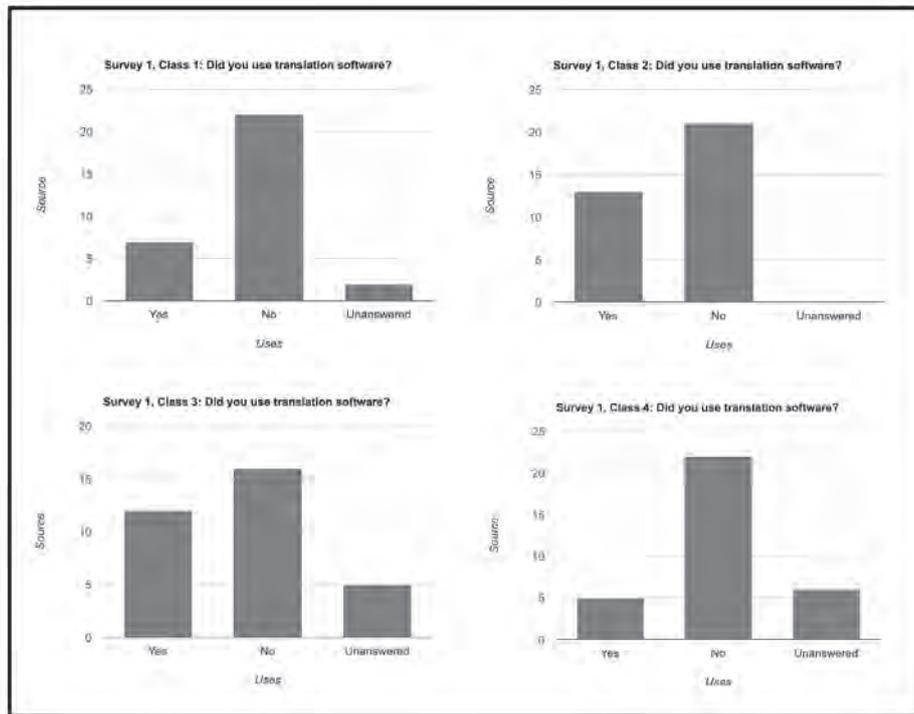
2.2. Survey 1

2.2.1. Survey 1 Overview

In a lesson about SDG (Sustainable Development Goal) 1 (No Poverty), students were asked to imagine living on 500

yen per day, write up a weekly meal plan, and reflect on the assignment in a single paragraph as homework. A survey was attached- of particular importance to this research were the questions, 1.) Did you use translation software (Google Translate, etc.)? If so, what did you use? and 2.) How often do you use translation software? (a. always b. often c. sometimes d. never) (nuances between answers clarified in-class). There was an optional section at the bottom of the survey for students to include any ideas or opinions regarding the assignment or survey. Not included here are data from questions regarding the time spent and difficulty level of the assignment (from the student's perspective).

2.2.2. Survey 1 results



With this being the first survey, students were forthcoming to a certain degree but hesitant in comparison with later surveys. Students past and present have generally expressed awareness of the fact that they should not be writing their assignment answers in Japanese and simply translating using machine translation, but there are not any clear consequences for doing so. We can see some variation between classes 1, 2, 3, and 4 (randomized, anonymous) and similarities in practice and attitude appear in later surveys. In each case, a majority of students submitting the surveys admitted to using software at least 'often' or 'sometimes.'

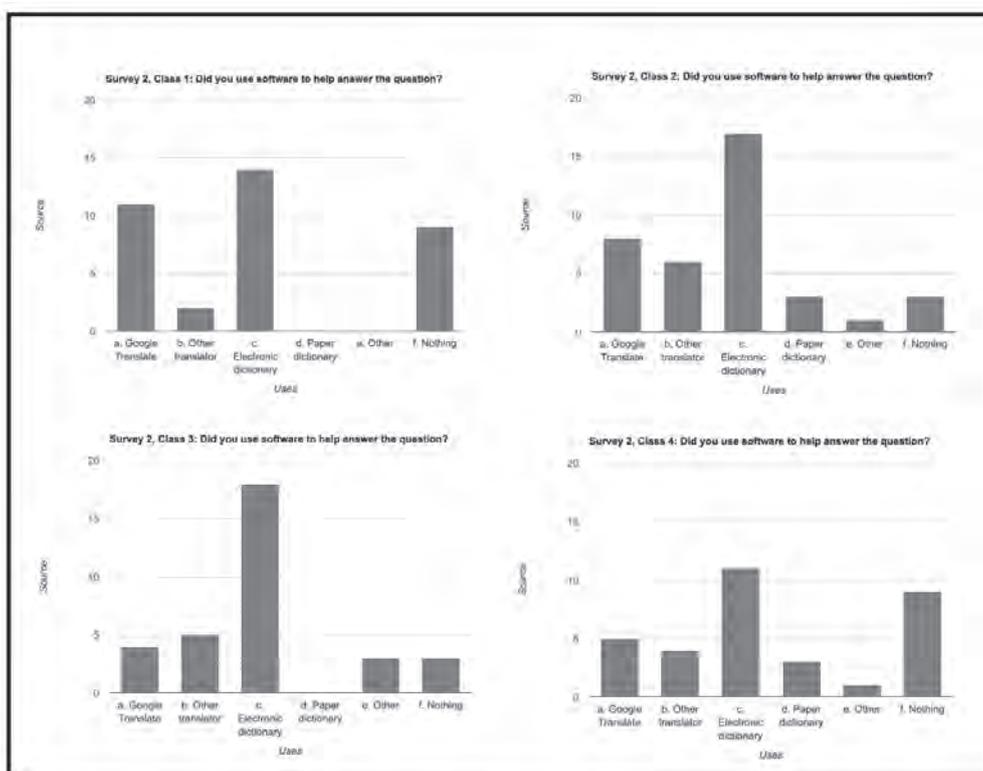
2.3. Survey 2

2.3.1. Survey 2 overview

Students were given a single-paragraph writing assignment as a final reflection following a series of CLIL (Content and Language Integrated Learning) lessons about SDG 6 (Clean Water and Sanitation): How do you feel about water problems? Students were asked to choose from five choices (including a sixth 'other'), and explain their choice in one paragraph (one half of a B4 sheet provided). On the right side of the sheet, in addition to questions about the difficulty of the topic, time spent on the homework, and further interest in the topic, students were asked the following questions of relevance to this research: Did you use software to help answer the question? (a. Google Translate b. other translator (specify) c. electronic dictionary d. paper dictionary e. other (specify) f. nothing) and 7.) Any more questions or comments?

The purpose of asking about both the difficulty of the assignment and the use of software was to gauge how much more likely students were to use software with a more difficult assignment, but for the purposes of this research only question 3.) above is of particular relevance, though some students left comments in 7.) that further clarified their answers in 3.).

2.3.2. Survey 2 results



Based on answers and monitoring prior and subsequent student use of software in-class, it can be estimated that students were still hesitant to openly admit to using software at this point, but a fair number of students were still forthcoming. Many of the electronic dictionaries students use have translate functions (as opposed to single-word searches), but it

can be currently assumed that the software is most likely not NMT-based, making detection in the event of extensive use easy to detect and therefore worth noting, but not analyzing in further detail here.

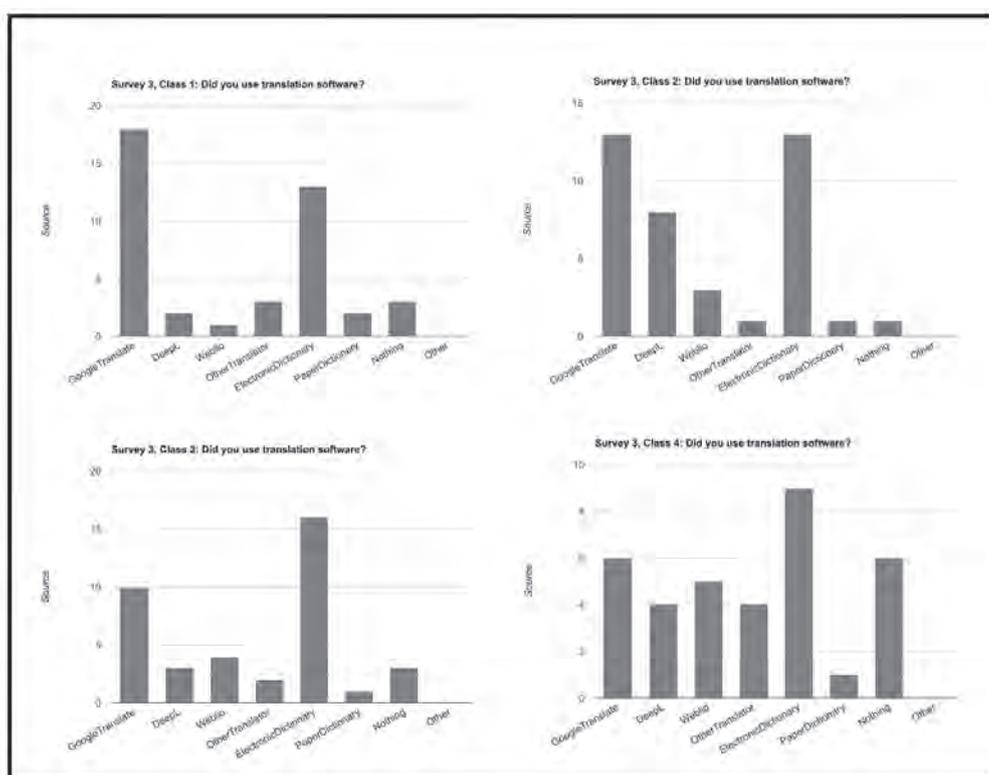
For question 3, many students gave multiple answers (a and c, etc.). Example student answers for e. (other) included, "my cram school teacher," "Safari to look into SDGs," "people," and "my brain." It is important to note that many students expressed awareness of the controversy of using software prior to the plagiarism lesson (countermeasure 1). For example, one student (class 2) for question 3 indicated a. (Google Translate), but wrote in the margins, "only a little!"

2.4. Survey 3

2.4.1. Survey 3 overview

In a CLIL series of lessons about SDG 5 (Gender Equality), students were asked to research and summarize one gender equality problem in Japan (one paragraph), and in the main section, describe a potential solution to the problem (minimum 80 words). This represents a more extensive writing assignment than the assignment attached to Survey 2. For Survey 3, students were asked two questions: 1.) Did you use translation software? (check all that apply) (Google Translate, DeepL, Weblio, Other (specify), Electronic dictionary (specify type), Paper dictionary (specify), Nothing.) and 2.) Any comments or questions?

2.4.2. Survey 3 results



Students had become accustomed to being asked about software use at this point in the year, providing what appear to be more realistic answers when comparing writing assignments and test scores and gauging in-class software use. In terms of translators, use of Google Translate, DeepL, and Weblio are widespread, though many students specified other translators. A number of students provided clarifying information in 2.) Any comments or questions? For example, one student wrote, "I used Google Translate as dictionary (I mean I didn't translate sentence [*sic*])."

3. Classroom approaches to student use of machine translation

The results of the surveys confirmed that many students were using software on their homework assignments, consistent with in-class observations. For the purposes of the course, English Communication, two large-scale goals became clear: 1.) Educate students about the acceptable parameters of use of translation software, discouraging what might be considered plagiarism and encouraging use that bolsters understanding and productivity, and 2.) Assess and find ways to improve student writing when unaided by translation software.

Given that student honesty was highly encouraged in the surveys, in deriving countermeasures to the use of machine translation in writing assignments, the instructor was careful to avoid reprimanding students for use, instead looking to clarify with concrete examples why extensive use of machine translation can be obstructive to present and future language study and future careers, clarify productive ways in which it may be used, and incorporate these methods into homework and student research. Each of these aims is concretely addressed in a corresponding countermeasure described below, with a careful focus on not accusing students of wrongdoing heretofore and directly or indirectly approaching plagiarism from a moral perspective. This underlying methodology most closely resembles what Cara Bradley (2011) outlines as "compliance" (defined by Bertrand Gallant), having strengths and weaknesses in comparison with punitive measures: "It focuses on the positive, and encourages students to think more deeply when making decisions in their academic work."

3.1. Countermeasure 1: Education on machine translation and plagiarism

A CLIL lesson spanning two periods per class (50 minutes each) was conducted with a focus on ways in which use of software translation is regarded as plagiarism at the university level and in professional careers in science, and the consequences of being caught. International examples were given alongside recent examples specific to Japan (Chiba, Yomiuri Shimbun). Students took notes, and were given opportunities to discuss, share ideas, and reflect (demonstrating understanding). Any material in the lesson could potentially be on the term-end test, furthering student engagement with the content. Student reception both in-class and afterwards was overwhelmingly positive, and students demonstrated comprehension of the material.

This class in particular aims at large-scale goal 1.) above, clearly illustrating why extensive use of software translation in a language class is a problem, and giving concrete, real-life examples as to the consequences of doing so (expulsion from school, for example, or harm to one's career). Of particular note for Countermeasure 2 below, students were told that using translation software in the same way they would a dictionary (for specific words and short phrases) fell within the bounds of fair use.

3.2. Countermeasure 2: Encouraging productive use of machine translation

Students were given the task of reading a particularly difficult news story about gender equality (Japan Times). They were encouraged to use any translation software they like to aid in comprehension of the material, though scanning the entire body of text would not be allowed. They were also asked to list and define the terms and phrases they found difficult enough to look up. The primary aim of the assignment, encouraging students to proactively use software to look up terms that they found difficult, was a success, with almost every student looking up five different terms or more and listing the definitions. The words and phrases chosen differed greatly depending on the individual, signifying independent effort (as opposed to copying or sharing answers). The wording of the definitions also differed, signifying use of multiple sources.

3.3. Countermeasure 3: Controlled writing, without the aid of technology

Students were given a series of in-class writing assignments (of low difficulty for their grade level) and told not to use software or a dictionary of any kind, including paper dictionaries. Students were, however, allowed to ask instructors or classmates for the definition of a word, and/or discuss in English. For example, after some in-class discussion, students were asked to write simple sentences about the town they live in. The instructors walked around the class, answering

questions and providing in-class checking. The students also engaged in peer correction, with the goal of formulating simple sentences with as few mistakes as possible. From here, the main in-class assignment was writing a paragraph (three or more sentences) about the town they live in, using the sentences they had already written and advice given on them as references. Similar exercises were conducted over the next four lessons. Students were very receptive to these exercises, appreciative of the interaction with both peers and instructors, and produced results that accurately reflected their own strong and weak points in writing, which were then identified and analyzed closely by each student individually in subsequent assignments to increase self-awareness and encourage improvement where necessary. For some students, just writing the initial singular sentences appeared to be a struggle, indicating significant dependences on software translation, potentially spanning years.

4. Conclusion and future considerations

Potential student use of translation software in ESL or other language lessons is a predictable problem anywhere, but the relative lack of education and consequences in Japan regarding plagiarism presents a particular difficulty, of increasingly pressing importance when preparing students for study abroad or for attending university abroad. As recently as 2016, it was easier to identify the use of translation software, and software use was limited in that the target writing level of a latter-year high school student was beyond the capacity of widely available software, but these distinctions have blurred with the introduction and proliferation of NMT translators.

Students proved receptive to the surveys, the plagiarism lesson, and the new approaches to homework (research, using translation software as a dictionary). It can only be expected that software use will increase in the future, and, as represented in the example countermeasures above, this will necessitate a variety of changes to the ways educators approach writing assignments and research, as well as necessitating clear and strict consequences and more thorough education regarding plagiarism.

A great deal of work and consistency is still needed to remind students about plagiarism and help prepare them for successful academic and professional careers at home and abroad. The surveys above and the described cases of small but meaningful changes to in-class and homework procedures appear to demonstrate that students are not only capable of understanding plagiarism, but are comfortable within the parameters of what is generally considered acceptable academic writing. Due to the speed of technological advancement, future consideration should aim not at the current state of translator use, but how further development (more accurate translation) and new and developing technology (student use of translators incorporating camera scanning, for example, is increasing rapidly in reading exercises) will impact lesson planning in the years to come.

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高校生における翻訳ソフトの使用について

－調査と対策－

ワータネン・ロス リチャード

抄録：特に外国語教育では、翻訳ソフトの発達や普及に伴い、盗用などの問題が増加している。高校一年生を対象に、翻訳ソフトに関する調査を行い、その結果をまとめた。それを踏まえ、翻訳ソフトを使うことのリスクと適切な使い方を説明するために三つの活動を行った：授業中に、インターネットや電子辞書を使わずにライティングの練習を行うことに加えて、盗用について内容言語統合型学習（CLIL）を行い、生徒にはリサーチ・ベースドの宿題を出した。

キーワード：内容言語統合型学習，CLIL，翻訳ソフト