

A Survey of the Use of Mobile Technology and Translation Tools by Students at Secondary School in Thailand

การสำรวจการใช้เทคโนโลยีมือถือและเครื่องมือการแปลของนักเรียน
โรงเรียนมัธยมในประเทศไทย

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Abstract

This quantitative research aimed to study the use of technology by students for their translation needs and investigate what tools the students use for the translation. The study was based on a survey of 1707 students in four secondary schools based in Chiang Mai. This included a representative sample of each year of study, known as Mattayom levels, to ascertain any trends or variations between students at different level of education. This paper analyses the results of the closed questions of a short questionnaire written in Thai. The findings showed that students extensively used mobile technology (90.6%) and prefer to use a phone for Thai-English translation (74.5%). Tools using Google Translate were voted most used by students (72.5%) then phone apps using LEXITRON (14.4%). The preference of phone over computer use increases after the first year of study and in the last year. Students in the initial years also indicated a significant preference for Google Translate (over 80%) as their most used tool but this preference decreases to only 58.1% for final year students.

Keywords: mobile technology, translation tools

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บทคัดย่อ

การวิจัยเชิงปริมาณครั้งนี้มีวัตถุประสงค์เพื่อศึกษาการใช้เทคโนโลยีเพื่อการแปลของนักเรียน และตรวจสอบเครื่องมือที่นักเรียนเหล่านั้นใช้สำหรับการแปล โดยเก็บข้อมูลจากนักเรียนจำนวน 1,707 คนจากโรงเรียนมัธยมศึกษาแห่งในจังหวัดเชียงใหม่ ซึ่งในจำนวนนี้ประกอบด้วยตัวแทนนักเรียนจากแต่ละสายชั้น (ในระดับมัธยม) เพื่อสืบหาความนิยมหรือความแตกต่างของนักเรียนในแต่ละสายชั้น งานวิจัยนี้วิเคราะห์ผลจากคำถามปลายปิดที่เขียนเป็นภาษาไทย ผลการวิจัยแสดงให้เห็นว่านักเรียนส่วนมากนิยมใช้เทคโนโลยีแบบพกพา (ร้อยละ 90.6) และเลือกที่จะใช้โทรศัพท์เพื่อการแปลภาษาไทยเป็นภาษาอังกฤษ (ร้อยละ 74.5) เครื่องมือแปลภาษาโดยกูเกิ้ล (Google Translate) ได้รับการลงคะแนนว่าเป็นเครื่องมือแปลภาษาที่นักเรียนนิยมใช้มากที่สุด (ร้อยละ 72.5) ถัดมาคือแอปพลิเคชัน LEXITRON ในโทรศัพท์มือถือ (ร้อยละ 14.4) ความต้องการในการใช้โทรศัพท์มือถือมากกว่าคอมพิวเตอร์นั้นเพิ่มขึ้นหลังจากปีแรกที่ทำการศึกษาจนถึงปีสุดท้าย กลุ่มนักเรียนในชั้นปีแรกๆ มักจะเลือกใช้เครื่องมือแปลภาษาโดยกูเกิ้ลมากที่สุด (มากกว่าร้อยละ 80) ในขณะที่กลุ่มนักเรียนในชั้นปีสุดท้ายมีความต้องการในการใช้เครื่องมือแปลภาษาโดยกูเกิ้ลน้อยลงเหลือเพียงร้อยละ 58.1

คำสำคัญ: เทคโนโลยีแบบพกพา เครื่องมือแปลภาษา

1. Introduction

The rapid growth of Information Technology use on mobile devices has been called the biggest revolution since the PC or the Internet, yet in Thailand there is little to no empirical research to support this view. Ownership of mobile devices is increasing and users are diversifying how they use their phone or tablet. The growing use of mobile technology effects many areas of IT including translation. There is insufficient information in Thailand to confirm students in particular are accessing translation tools via

mobile devices and what tools they are accessing. This report details the research into translation tools used by Thai students to translate the Thai language to and from English. This includes a survey of 1707 students in Thailand that indicates they use mobile technology and they prefer to use phones over computers for their translation.

The survey has two primary objectives: (1) to confirm the use of mobile technology by Thai students for translation purposes, and (2) to ascertain which tools students use for this translation. The technology or hardware that students use is categorized as either a computer, a phone, a tablet or another method. The software, online service, or phone app that uses machine translation is referred to as the translation tool. Students often use dictionary-based services therefore the research determines if the students use these translation tools for more advanced use such as the translation of phrases, sentences or longer text. Longer text could involve a paragraph, an email or a web page. Secondary aims also include the student's level of satisfaction with the translation, problems encountered, and students' opinions on their translation needs.

In Thailand the importance of ASEAN membership is a prominent issue. The world's largest current translation service is provided by the European Union and this example of the translation of several languages is relevant for the countries that are ASEAN members such as Thailand. The primary language used for ASEAN is English and this signals a potential growth in interest in Thai to English, and English to Thai, translation services. Therefore this study concentrates on the automatic translation of English for Thai students.

There is a wide range of research into machine translation (MT) especially Statistical Machine Translation (SMT) recently although much of

this research focuses on European languages. The difficulty of some Asian languages, such as no word or sentence boundaries, results in the lack of portability in the techniques used for European languages. The growth of the Internet, computer power and large amounts of available text has seen the rise of interest in automatic translation and SMT in particular. This has led to the availability of multilingual online translation services. Students access these online tools, search engines, and phone apps via their phone or tablet. With the benefits of anytime, anywhere, the use of mobile technology to study is increasing but there is no research to confirm that Thai students are using mobile technology for translation. It is not known how much students are reliant on this technology or the quality of the services provided.

The findings show that over 90% of students in the survey use a phone for translation purposes (90.6%) and when stating a preference the students that prefer a phone (74.5%) outnumber the students that prefer to use a computer for translation (22.5%). The majority of students, 1216 (72.5%) who provided a first choice stated they use a translation tool powered by Google Translate. Both academics and educators should be aware of the extensive use of mobile technology by students for translation. There is a need to determine how the use of mobile technology and translation tools can be used to the advantage of the student and not for undesirable use such as plagiarism.

2. Related Work

The growing use of mobile technology is being compared to the Internet revolution (Kats 2013) and for many it is replacing the use of PCs (Bonnington 2015). In 2011, manufacturers shipped more smartphones than computers (Aguilar 2012). In 2014 people worldwide spend more time on

their smartphones than on traditional PCs (Halleck 2014), more people in America own phones than computers (Murtagh 2014) and the amount of mobile devices overtook the number of people in the world (Davies Boren 2014). It is reported that more web searches were requested on mobile devices than on personal computers (Daily Mail Online 2015).

Mobile devices are normally associated with communication and leisure but surveys suggest students use mobile technology to aid their studies. 83% of students accessed the Internet through a mobile device (Wilkinson and Lancaster 2014), over 80% of students stated they use technology for learning and research (Kessler 2011), and are using mobile devices in their studies (Chiriac 2014). Reports also indicate the use of mobile technology for **translation**. In 2012 60% of foreign language students stated they use a smartphone **for language-learning** purposes (Simon and Paige 2012), and in 2013 71% of students reported using Machine Translation often or sometimes in their language learning (Muller 2013).

Research is showing that mobile technology can engage and inspire students to learn (Nielson 2013). The use of mobile technology in language learning has led to the development of a new research area called mobile assisted language learning (MALL), see (Kukulka-Hulme 2008) for an overview. The advantages of using mobile technology include the familiarity of the device to the user, the availability of anywhere, anytime, and the accessibility of translation services. In addition, students are more proficient and regular users of mobile technology, use these devices for longer and for more tasks, and place a greater value to mobile devices than standard computers (Bibby 2011). Although Somers (Somers et al 2006) reports the inappropriate use of online machine translation involving plagiarism.

There is a lack of empirical research of the use of translation tools and the use of mobile technology for the purpose of translation in Thailand. There is much current research on the use of mobile devices although few look specifically at the use of applications by students (Bomhold 2013). A survey of online tools by Thai students noted that little is known about how Thai students use tools for translation (Munpru and Wuttikrikunlaya 2013). The survey of 65 University students suggests online tools are used by Thai students for Thai-English translation. The preferred tool for machine translation was Google Translate (81.5%) and choice of search engine was Google (98.5%). This preference for Google-based tools is seen in a 2013 report where the majority of MT users, 81% of respondents, use Google Translate as the tool to support their language learning (Wilkinson and Lancaster 2014). In a 2012 survey, 33% of students cited Google as being “the one website that they couldn’t live without” (Merschel et al 2013). Although an online report (Shen 2010), detailing research evaluating online tools, stated participants selected Google Translate over the Microsoft Translator 21% more often when they knew the brand compared to when the brand were hidden. This brand bias increased when comparing Google Translate with other translators.

3. Study Methods

The survey of 1707 students from four schools based in Chiang Mai was carried out during June 2015. Both Government and private schools are represented in the survey. Students in Chiang Mai may not accurately represent all students in Thailand, nevertheless, it is hoped inferences can be drawn from the sample of these schools. The survey is based on in-person

interviews with answers gained directly from the students to achieve a good response rate and has the benefit of the assistance of the interviewer.

3.1 Research Questions

The primary research questions are (1) do students use mobile technology and prefer this use to computers? (2) What translation tools are students using? The secondary issues include: (a) do students use these tools to translate phrases, sentences and longer text? (b) Are students satisfied with this translation, (c) what problems do they have, and (d) what are the students' views on what they think they need to help them with translation?

3.2 Survey Instrument

The survey is based on a short questionnaire that includes four areas of interest:

1. Use and preference of technology. The survey includes two closed questions asking the students what technology they use for translation, and what technology they prefer to use the most. The choices are presented in the order of computer, phone, tablet and other.

2. Choice of translation tool. When completing the questionnaire students can give up to five answers for their choice of translation tool. The interviewer requests the students' translation tool that they use the most, the second most etc. A set of potential answers, with their logos, were printed on a help sheet for the interviewers.

3. The use and satisfaction of translation for phrases, sentences and longer text. The students are asked if they translate text of greater length than one word, and if so what is their level of satisfaction with that translation. The student can indicate their level of satisfaction using a Likert scale for each of the three text lengths.

4. Two open questions concerning translation problems and students' opinion on their translation needs.

The questionnaire also includes a section for personal details such as age, gender, and year of study.

3.3 Sample

To estimate the amount of participants of the survey **we applied a stratified random sampling** approach. Stratification may produce a smaller bound of error of estimation when there are homogenous groups (Scheaffer et al 2014). **Stratified random sampling** involves dividing a population into subgroups and then taking a simple random sample in each subgroup (Trochim 2006). Language learning needs and proficiency, and the use of technology, differs between educational levels therefore the students are divided by the year of study as strata. In Thailand the years of study for secondary schools range from Mattayom one (12-13 years old) to Mattayom six (17-18 years old).

To achieve a fair representation of students from each strata the sample size was calculated using the Krejcie and Morgan sampling method (Krejcie and Morgan 1970). First we obtained the total amount of students in each school, and the amount of students in each year of study, then we calculated the minimum amount of participants for each strata, and finally a random sample of students from each strata were interviewed. Table 1 shows the sample size for each school and year of study. Each sample is above the required threshold for a confidence rate of 99% with a five percent (5%) margin of error.

Table 1 Sample number of students in each year of education

	School				Total
	A	B	C	D	
Population	3333	2794	3192	617	9936
Year of Education	Sample				Total
1	70	70	67	24	231
2	65	74	83	19	241
3	53	61	77	22	213
4	79	72	81	70	302
5	78	109	96	61	344
6	87	141	88	60	376
Total	432	527	492	256	1707

4. Analysis of the Survey Results

The results are presented in three main sections: the use of mobile technology by students, the use of translation tools by students and the secondary findings that include the students' satisfaction with the translations.

4.1 Use of mobile technology by students

The first primary objective of the survey was to confirm the extensive use of mobile technology by students in Thailand for translation between the Thai and English languages. The results show that students in the survey use mobile technology, and prefer to use mobile technology, over the use of computers. When asked what technology they used for translation 90% of the students stated they use a phone (1546 students, 90.6%), 70%

use a computer (1215 students, 71.2%), 375 students (22.0%) use a tablet, and 51 students (3.0%) use another method. The other methods included using a dictionary (30 students), a notebook, an iPad, a talking dictionary or a book.

The use of technology for translation was consistent over the schools and years of study. Three of the four schools results showed $92.1\% \pm 1\%$ phone use and $70.2\% \pm 0.5\%$ use of computers. The remaining school had a slightly higher use of computers (77.0%) and phone use was lower at 82.8%. Tablet use ranged from 18.4% to 24.2% between the four schools. The use of computers and phones across the years of study differed by about 5% and 10% respectively, with a range of 67.6% to 73.3% for computer use and 83.1% to 93.9% for phone use. Although there is a clear difference seen between M1 and M6, this was not consistent between other years of study. For example, computer use is relatively low for M6 (67.6%) but high for M5 (73.3%), and, phone use is relatively low for M1 (83.1%) but high for M2 (91.3%).

The amount of students that preferred to use a phone was over three times the number of students that preferred to use a computer for translation. A total of 1530 of the 1707 students gave a single preference of technology. Of these 1530 students, 1140 (74.5%) stated the phone as their preferred choice, 345 (22.5%) indicated a preference for computers, 41 (2.7%) elected tablets and four (0.3%) stated another choice. The remaining students included 164 students who gave a joint preference and 13 students that did not give an answer. Most (133) of the 164 students included both phone and computer in their joint preferences therefore the research continues to focus on the students that gave a single preference. In three of the schools the difference in preference was minimal. Computer preference was $21.5\% \pm 1.6\%$ and phone selection $75.8\% \pm 2.1\%$. The remaining school had a slightly higher use of computers (27.9%) and phone use was lower at 66.7%.

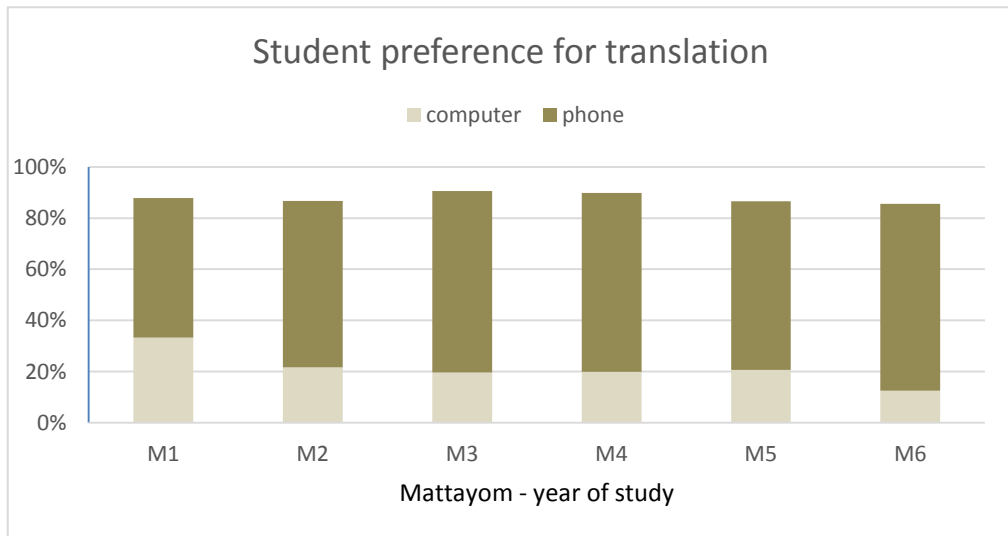


Figure 1 Comparison of student's preference between computer and phone use for translation in each year of study

The students' preference in use of technology for translation was not consistent over the years of study (see figure 1). Over 30% (33.3%) of M1 students indicated a preference for computers whilst phone preference was under 55% (54.5%). The four middle years of study, M2, M3, M4 and M5 students, gave consistent answers for their preferences. They indicated a preference for computers in 20.7% \pm 1%, and phones in 68% \pm 3% instances. A further increase in preference for phone use and decrease in computer use is seen with students in M6. Only 12.5% of M6 students stated the computer as their preferred translation technology, in contrast 73.1% of M6 students like to use a phone.

The gap between the amount of students that prefer a phone for translation over computer use increased from 21.2% (M1) to 37.3% (M2 to M5), to 60.5% (M6). The results indicate students increase their preference for using their mobile phone for translation over a computer after the first year and in the last year at secondary school.

4.2 Use of translation tools by students

The second primary objective of the survey was to determine what tools students' use for translation between Thai and English. The questionnaire gave students the opportunity to give five answers in order of most use. The students selected a wide range of tools totaling 73 unique answers. These were a selection of online tools, phone apps, search engines, PC software, social network tools and non-digital answers such as a dictionary. The results presented are based on the first choice of the students, rank #1, and all of the tools given by the students, rank #1 to #5.

4.2.1 Translation tool used most (rank #1)

The results show a distinct preference for tools that are powered by Google Translate. The ten most popular translation tools account for over 90% (90.6%) of the tools most used by the students, and the first three are provided by Google (see table 2 below). Over 1000 students gave Google Translate as their most used tool, although they were evenly split between using the phone app and accessing the online version. Aside from a standard dictionary the other tools in the top ten were dictionary-based phone apps. Some of these apps provide a translation service (e.g. Line dictionary).

Perhaps surprisingly was the absence of any Microsoft-based tools in the top ten. The highest rank tool from Microsoft was Facebook ranked 12 chosen by 18 students. Phone apps from both Line, an Asian messaging service, and Translate, who provide Dictionary.com, were ranked equal ninth and chosen by 23 students. Other translation services include Baidu, ranked 14 with 10 students, and Babylon, ranked 30th with one student.

4.2.2 Translation Engines

Many of the tools produce the same translation but differ by the method of access. Translation services often provide different applications such as an online tool, PC application software and an app for a phone and tablet. These essentially are the same service and provide the same translation. To summarize, many of the translation tools stated by the

students are methods of using the same translation service. Other services can also produce the same translation if powered by the same translation engine.

Table 2 Top ranked translation tools as selected as used most by the students

<i>Rank</i>	<i>Translation Tool</i>	<i>Description</i>	<i>Translator</i>	<i>f</i>	<i>%</i>
1	Google Translate	phone app	Google	520	30.46
2	Google Translate	online tool	Google	509	29.82
3	Google	search engine	Google	153	8.96
4	Thai Dict - Easy Dictionary	phone app	Lexitron	99	5.80
5	Thai Fast Dict Dictionary	phone app	Lexitron	75	4.39
6	A Dictionary			69	4.04
7	Thai Dict	phone app	Lexitron	50	2.93
8	Thai English Translator	phone app	Google	26	1.52
=9	Line Dictionary	phone app	Line	23	1.35
=9	App Dictionary.com	phone app	Translate	23	1.35
	Other			160	9.37
	Total			1707	100

** App details available at the Google play app store (Google Play, 2015)*

To present the results of the different translation services, irrespective of the access method, the tools are grouped by the translation engine. For example, the Microsoft Translator is a service used by the Bing search engine,

the Bing phone app, products such as Facebook, Twitter, and Skype, and is also the translation engine used for the iTranslate phone app and freetranslations.com website. Microsoft Translator, Google Translate and other translation services are provided together on some websites such as lovetranslation.com, imtranlator.net and stars21.com. These sites are application program interfaces (APIs) and categorised separately.

Several translation providers deliver the same translation service such that any translation from Thai to English or vice versa is identical. The translations provided by Babylon, SDL Language Weaver and WordLingo are identical and grouped in the results as the 'Babylon' translator as the Babylon translation tool was listed by more of the students in the survey.

Table 3 Student's use of translation tools grouped by translation engine

<i>Rank</i>	<i>Translator</i>	<i>f₁</i>	<i>%</i>	<i>f₁₋₅</i>	<i>%</i>
1	Google	1216	72.5	2570	47.9
2	Lexitron	242	14.4	948	17.7
3	Microsoft	38	2.3	618	11.5
4	Line	29	1.7	381	7.1
5	Translate	27	1.6	118	2.2
6	Baidu	12	0.7	74	1.4
7	Babylon	3	0.2	45	0.8
	Others	110	6.6	607	11.4
	Total	1677*	100	5361	100

* 30 students did not answer or gave invalid answers

4.2.3 Translation tools used most grouped by translation engine

The results are grouped by translation engine (Google 2015, Lexitron, 2015, Bing, 2015, Line 2015, Translate 2015, Baidu 2015, Babylon, 2015) in table 3. This shows both the frequency of the most used tools, f_1 , and all of the tools given by each student, f_{1-5} . The first choice by students is dominated by tools powered by Google Translate (72.5%). Interestingly the second most popular translation tools were Lexitron dictionary-based phone apps (14.4%). Lexitron (presented as LEXITRON) is provided by NECTEC in Thailand. NECTEC provided an English-to-Thai translation service known as Parsit (Modhiran et al 2005) originally to translate web pages. The name changed to Lexitron and the service now includes an online membership facility, a PC application and a dictionary service used by several phone apps. The services provided by Google and Lexitron account for nearly 87% of the students (86.9%) with the third most used translation service, Microsoft Translator, at only 2.3% of the translation tools ranked first by the students.

4.2.4 Translation tool used most grouped by year of study

Although the results show a consistent preference for the use of translation tools powered by Google Translate, the preference decreases as the students' progress through the years of study. Over 80% of students in M1 (84.9%) and M2 (82.2%) indicated Google Translate as their number one tool for translation. In the next three years, M3, M4, and M5, the preference drops to about 70 to 75% (73.2%, 76.5%, and 69.4% respectively) This reduces further to under 60% for M6 (58.1%). These results illustrate a reduction in the selection of Google Translate as the main tool for translation for students throughout the years of study.

4.2.5 All translation tools listed (rank #1 to #5)

In the survey the students selected up to five translation tools in order of use, ranked #1 to #5. About a third (33.7%) of the participants gave five translation tools in their answer. More than half (53.4%) gave at least three choices and only 30 students (1.8%) gave no answer or invalid answers. The total number of answers, in any of the five places given, was 5361 answers. In table 3 the frequency, f_{1-5} , and percentage of the instances for each translator, is seen in the last two columns.

The choice of translation tool is spread more evenly over the five choices in comparison to the most used. The Microsoft-based tools occur in over ten percent (11.5%) of all the answers and Line 7.1%, although these are still lower than Google Translate (47.9%) and Lexitron-based tools (17.7%). The order of preference of the seven translation services is the same for both the most used tools and all the tools.

Students named a Google Translation-based tool on 2570 different occasions, a figure that is nearly half of the total of all the 5361 instances (47.9%). This suggests that not only is Google translation the most used by students but it is also accessed through different applications by many students. In some cases students maybe unaware that two tools offer the same translation, alternatively students want the different services offered by tools even if the translation is the same.

4.2.6 Translation tools used grouped by year of study

The results showed no significant differences between years of study for the translation tools. The translator with the largest difference between Mattayom years was from Microsoft that ranged from 7.9% (M4) to 15.4% (M1), and the use of Lexitron in the first years of study (M1, M2) is lower than the remaining years by about 6%. There was also little deviation between schools with the exception of the use of a dictionary. About 50 students stated they like to use a dictionary in school A (4.4%) and school B

(2.9%) but this increased to 110 students (7.0%) in school C and decreased to one student (0.1%) in school D.

4.3 Secondary findings

The selection of translation tools included many dictionary-based applications that provide a simple word look-up facility so the students were asked if they used the translation tools for more than one word. In the survey 1507 students (88.3%) answered yes they do, 185 (10.8%) said no, and 15 (0.9%) did not give an answer. The students were also asked if they translated phrases, sentences or longer texts, and how satisfied were they with the translation. The options ranged from very satisfied, satisfied, it's OK, a little unsatisfied and very unsatisfied.

The results indicate the students are satisfied with the translations with just over 85% (85.2%) selecting either satisfied, very satisfied or OK. Students appear to have realistic expectations for the translations and rate the translation tools comparatively. The pleasant nature of Thai students could also be a contributory factor to the positive levels of satisfaction.

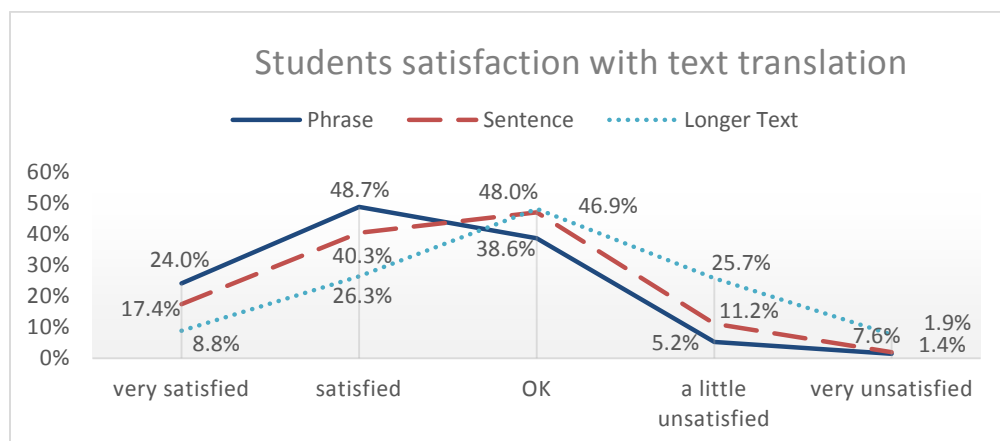


Figure 2 Student's satisfaction with the translation of phrases, sentences and longer texts

In figure 2 we compare the results for the satisfaction of translation of phrases, sentences and longer texts. The students were most satisfied with the translation of phrases. Over 70% (72.7%) voted for either satisfied or very satisfied with phrase translation. Very few (6.6%) voted for either a little or very unsatisfied. The satisfaction of sentences was also positive with 17.4% voting very satisfied, 40.3% satisfied and 46.9% stating the translation is OK. The very unsatisfied votes remained low at 1.9% but the amount of students who are a little unsatisfied doubled from phrases to 11.2%. Finally the results for longer text was more balanced with about half of students (48.0%) voting OK, and similar results for very satisfied (8.8%) and very unsatisfied (7.6%), and satisfied (26.3%) and a little unsatisfied (25.7%).

The questionnaire finished with two open questions concerning translation problems and students' opinion on their translation needs. There was a considerable amount of shared feeling amongst the students with the understandable concern of incorrect translations. The improvement of current tools and the availability of desired tools, such as a talking dictionary to improve pronunciation, are amongst the answers for what the students felt they needed to help meet their translation needs.

5. Conclusion

The research determined the students in the survey not only use their phones for translation but prefer to use a phone over a computer. In addition, the students also indicated a preference for translation provided by Google Translate over the other translation services. Both of these findings are consistent with previous research mainly outside of Thailand. The use of

a phone increases and the dependence on Google Translate decreases with the advancement of the year of study.

Students are aware of the wide range of translation tools but the functionality of the tool appears as important as the quality of the translation. The students may use many different tools but these tools offer a very limited amount of variety between a small set of translation engines. The availability of text written in both Thai and English, used by statistical machine translation, will increase with ASEAN membership and may help improve the quality of Thai to English and English to Thai translation. The indication is that the students will access whatever translation services are available via their mobile phone.

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