

The Effect on Using Automatic Machine Translation for Motivating Reading Skill

**Thepchai SUPNITHI, Kanokorn TRAKULTAWEEKOON, Wasan NA CHAI,
Taneth RUANGRAJITPAKORN**

*Human Language Technology Laboratory, National Electronic and Computer Technology
Center, Thailand Science Park, Pathumthani, 12120, Thailand*
{thepchai.sup, kanokorn.tra, wasan.na_chai, taneth.rua}@nectec.or.th

Abstract: In this paper, we develop a framework to increase student's motivation by applying automatic translations which provide Thai translated output to students. Students have to edit or correct the translation results from the system and receive comments from teacher. Based on this framework, the system enables them to increase their motivation in reading. We evaluate results of our system at Thammasart Klongluang School. The students get a significance improvement and satisfy with the system.

Keywords: reading assistant system, English learning, skill improvement tool

Introduction

English language is recognized as an important language for cross-cultural communication. Based on the statistics of ETS TOEFL score [1], Thai people averagely gain 493 of paper-based test. It is inadequate for them to study in English program curricula which require at least 550 score. This issue also reflects as a barrier on a communication in details and knowledge sharing of Thai specific resources with other countries [2].

To improve language learning, technologies are applied for assisting learners to access resources and educations. However, most of Thai teachers are conservative and tend to ignore applied technologies. Therefore, it is difficult to apply new challenging approaches, and only simple technology such as dictionary and automatic translation can only be exploited. Recently, a research on applying dictionary into e-learning system [3] was purposed for Thai EFL. It helps students' reading by providing bilingual dictionary. It was proven that the system eases students for expanding their English vocabularies. In this paper, translation is applied to English learning although previous researches claimed that translation is not a good approach for such task. In this paper, we focus on how much a translation can help students if translation method cannot be avoided. In this work, a reading skill is concentrated because it is fundamental and lead to other skills acquisition.

One of the most problems on English learning for Thai students is unknown word, inflection and unfamiliar syntax. This effectively lowers students' motivation on learning English. This system attempts to ease the learning on reading passage by providing assistant functions such as dictionary, automatic translation, online discussion with instructor, and so on. These functions leastwise increase a chance for student to overcome a barrier of unknown word and structure which will motivate them more on English language learning.

1. An overview on our system

Motivation is the most important issue for improving a reading skill. Motivation is gained once the reading becomes easier and more understandable. Results from automatic translation will help students to roughly understand the content. For non-fluent English students, it is less suffer than starting from reading all passage which a plenty of difficult words and structures. Moreover, the more learners edit the translation for smoother result

and get teacher's feedback, the more students understand and gain motivation and confident on their reading. Figure 1 shows the overview of our system architecture.

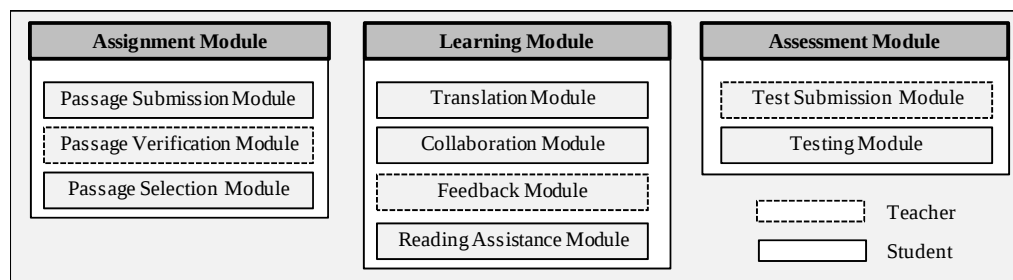


Figure 1: An overview of system architecture

1.1 Assignment Module

This module is designed to enable an appropriate passage selection and classification. Students are required to manually select the appropriate passages from various sources and submit it to teacher. This module can be divided into three sub-modules.

- **Passage Submission Module:** This module provides a user interface (UI) for students to search and submit their interested passages. It also provides search engine.
- **Passage Verification Module:** This module is designed to classify passages into appropriate level to control difficulty of the chosen passages. There are two factors. 1) **Passage appropriateness** approves a syntactically correctness of the chosen passage. For example, the passage written by non-native English tends to contain many errors. 2) **Passage Level Decision** checks the appropriate level of passages regarding to students' capability.
- **Passage Selection Module:** This module shows a UI that lists verified passages for students to select.

1.2 Learning Module

This module consists of four sub-modules.

- **Translation Module:** This module provides automatic translation of the English passage to Thai. Currently, we provide Google Translation and Parsit [4] with translation memory [5], which enable students to select a translation result which they like most and edit the incorrect translation.
- **Collaboration Module:** This module enables students to share their edited translations and comment other's works to improve their reading technique together.
- **Feedback Module:** This module is for teachers to give a feedback and correct students' work.
- **Reading Assistance Module:** This module provides assistant tool for students to understand more precisely on the passage. This includes dictionary, translated word alignment, and English parsing tree to realize English structure in details.

1.3 Assessment Module

This module is designed for evaluating the student's improvement. There are two sub-modules provided.

- **Test Submission Module:** In this module, teacher can submit his/her test. Test format and type are designed by using hot potato [6] which enables several test methods. Teacher can separately limit testing time for each test.

- **Testing Module:** This module shows UI for pretest and protest to students. An automatic scoring result is also provided to teacher by this module.

2. Experiment Setting and Result

In an experiment, 50 students in grade 10 from Thammasart Klongluang School were randomly chosen to join this program. Each student was respectively given three assignments. The first task is to take a pre-test for measuring their English skill. Second, students were grouped into a team of four persons and worked together on translating four personally chosen passages with an aid of automatic translation from our system. Lastly, students took a post-test to show their improvement after using the system. In terms of evaluation, we appraise the system by using questionnaire for its user-friendly and monitoring the difference of score between pre-test and post-test to examine students' improvement. The satisfaction scores in questionnaire are ranked from 1 (worst) to 5 (best). The results of satisfaction scores are shown in Table 1 and Table 3. An improvement of students is illustrated in Table 2.

Table 1: System evaluation

Evaluation topic	Ranking					Satisfaction Score
	5	4	3	2	1	
System Performance	15.85	52.44	28.05	2.44	1.22	3.79
User Friendly	18.29	56.1	22.36	1.63	1.63	3.88
Design	25.2	53.66	19.51	0.81	0.81	4.02

Table 2: Student's tests result

Evaluation	Min	Max	Avg
Pre-test	15	62.5	37.5
Post-test	53.33	100	76.66

Table 3: Student's personal evaluation using questionnaire

Evaluation topic	Ranking (before/after)					Satisfaction Score
	5	4	3	2	1	
English Level	7.32/14.63	48.78/48.78	31.71/31.71	9.76/2.44	2.44/2.44	3.49/3.71
Vocabulary Coverage	9.76/12.2	41.46/53.66	34.15/31.71	12.20/0	2.44/2.44	3.44/3.73
Improvement Ability	12.2/7.32	31.71/48.78	46.34/41.46	9.76/0	0.81/0	3.44/3.59
System Benefit	24.39	56.1	19.51	0	0	4.05

3. Conclusion and Future Work

We implemented the web-based reading assistant system for helping in reading English passages by applying a translation approach. We found that students who joined the program gain more motivation and confidence in their English capability. Their English reading skill is significantly improved. In the future, we plan to develop an automatic system to check a passage level to reduce teacher's load on approving an appropriate level of passage that students select for reading. We also plan to extend this system into an actual English education in a high school program.

References

- [1] ETS (2010), TOEFL® Test and Score Data Summary for TOEFL Internet-based and Paper-based Tests: January-December 2009 Test Data.
- [2] Wiriyachitra, A.(2002), "English Language Teaching and Learning in Thailand in this Decade", Thai TESOL Focus, Thailand.
- [3] Orrawin M, Pornchai T, Narasak A, Neetiwit B, Buntita P, Thepchai S (2008). "Dictionary-based Translation Feature in Open Source LMS ~ A Case Study of Thai LMS : LearnSquare". In Proceedings of International Conference on Advanced Learning Technology ICALT '08.
- [4] Virach S, Paisarn C, Mothika B and Lalida B (2000). "ParSit: English-Thai Machine Translation Services on Internet". In Proceedings of 12th Annual Conference, ECTI and New Economy, National Electronics and Computer Technology Center, Bangkok. (in Thai).
- [5] Thepchai S, Kanokorn T and Supon K (2007). "A Cooperative Work Environment for Translation ~ Integrating MT and TM for Community". In Proceedings of IJCKS 2007.
- [6] Half-Backed Software Inc, "Hot Potatoes version 6" [Online], Available : <http://hotpot.uvic.ca/index.php>