

A Virtual Environment for English as Foreign Language Learning Platform (veEFL): Applied "Single Idea of Concept" to Improve Writing skill of Low English Proficiency Students

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Abstract: In order to assist EFL students with low English proficiency in learning writing skill, we propose a framework of a virtual environment to evaluate common errors that the students often conduct in writing essay. The system is a service applied in platform linked with other NLP services to help with language analysis. The system mainly focuses on finding the writing errors related to semantic meaning selection, incorrect structure to indicate the intended meaning, non-smoothing sentence in topic, and etc. The system improves the students' writing skill by providing questions relating to the matters they are writing.

Keywords: Single Idea of Concept, Unified Paragraph, English as Foreign Language Learning (EFL), Writing Skill, Low English Proficiency, Natural Language Processing (NLP)

1. Introduction

Writing is one of the most troublesome skills in teaching (Pawapatcharandom, 2007). For non-English-native students, the usage of words may be ambiguous due to the low efficiency and lack of understanding in word senses. The hardest part is to find the intended meaning of sentences from the written content.

In Thailand, English studying program in lower-secondary school education (Grade 7-9) isn't arranged as a study program in major likes in high school education (Grade 10-12) or University. Students who study English in lower-secondary school education will be taught English as one subject including all basic skills in.

The English teacher may choose low English Proficiency students (LEPS) who have under average score in English writing skill. LEPS are not able to develop their English skills independently. They need an English teacher to suggest and explain about the reason of making mistakes. Thus, a Virtual Environment for English as Foreign Language Learning Platform (veEFL) is built to assist improving English writing skill for the LEPS.

The best way of studying writing is to enable the students to develop their thinking by themselves. Some of them have difficulties in how to continue the story. As provided a writing assignment about "What is your favorite hobby?", for example, most of the learners...". On the other hand, the LEPS may come to impasse to construct sentence (or expand sentences) smoothly.

Therefore, veEFL provides the students with questions relating to the matters they are writing. veEFL will generate the questions from the student's input sentence at real time. veEFL will analyzing structure of the input sentence and extracting into keywords. By this method, the student will expand the idea from the generated questions from veEFL. The result is that they can write more sentences related to the topic and understand by themselves how to construct more sentences relating to the keyword.

To implement the above-mentioned tools, there are several necessary Natural Language Processing (NLP) resources and tools such as WordNet for synonymous and hierarchical meaning, FrameNet for theme accordance, and Syntactic Parser for analyzing main verb, subject and complement, and so on. To facilitate the writing assistant tools, Web Service is introduced to link existing services from shared service.

2. Common Errors in EFL Writing skill of Low English Proficiency Students

Thai Grade 7 students have started studying English from vocabulary, part of speech, type of sentence and tenses respectively. For Thai Grade 8-9 students, they have practiced English writing. If the students want to create good English Writing skill, they need to know how to apply Unified Paragraph idea and Paragraph Composition together. This skill will make the students create their own ideal writing essay.

There are three obstacles of writing Unified Paragraph for: (1) Semantic Meaning Selection, (2) Incorrect structure to indicate the intended meaning, and (3) Non-smoothing sentence in topic. (Kritsuthikul, Nattee, Supnithi, & Hasegawa, 2012) The last problem (Non-smoothing sentence in topic) is also a problem of creating Paragraph Composition.

2.1 Semantic Meaning Selection

Semantics is the study of the meaning of linguistic expressions. It concerns about the relation among words, phrases, signs and symbols. So, the problem on Semantic Meaning Selection is the problem of choosing an inappropriate word applied in a context to create a misunderstood translation and lead difficultly to find the intended meaning in the sentences from the written content.

Most of Low English Proficiency of Thai students often uses Thai to English translation as a pattern applied in English writing. This leads them to use a word to word translation. In such circumstances, the teachers may find it particularly difficult to guess the accurate meaning of students' thought without having personal discussion. In order to expedite the study of writing, tools for scoring are essential for writing a given topic and suggesting appropriate writing concept

To resolve this problem, Thai knowledge would be applied as follow are needed (1) the most frequently misused word to word translation from Thai to English, (2) Thai WordNet (Leenoi, 2008), and (3) Thai FrameNet (Leenoi, 2010).

2.2 Incorrect structure to indicate the intended meaning

The structure of a sentence is a group of words gathering as a sentence in order to create the intended meaning. The structure is related to grammars. Incorrect structure is also grammar mistakes. Incorrect structure is more likely to express the wrong intended meaning.

In Thai language, there is no rule of verb inflection. They can use all the same verb in any time of situation but in English, we have to change the verb form to suit with the time of situation happens. Though this type of error is not serious mistakes, it can create the problem of misunderstanding. However, Semantic Meaning Selection problem is difference because it doesn't make the grammatical errors in the sentences

2.3 Non-smoothing sentence in topic

When we write an essay, there are many groups of sentences gathering together as a paragraph in order to describe what the content is. Every single sentence in a topic will be arranged to generate the author's idea. Smoothing sentence can help the teacher easily sequence the story line as the topic. Therefore, we can imply that non-smoothing sentence in topic can lead both the student and the teacher misunderstood the intended content.

For example of the sequence of time. There are three sentences gathering together to tell the story: (1) "I go to school." (2) "I study Math in the afternoon." (3) "I play football in the morning." the correct order would be sentence number (1), (3), (2) respectively.

For example of non-coherence. There are three sentences gathering together to tell the story: (1) "I go to school." (2) "My father likes fishing." (3) "My friend likes playing football." from these sentences, none of these sentences is related together.

Lastly, writing smoothing sentences can help not only the students organize and generate their idea but also the teachers understand the story easier. To resolve this problem, Single Idea of Concept is applied to assist the student to writing more smoothing.

3. Single Idea of Concept

Unified Paragraph is a paragraph which focuses on explaining one idea in one paragraph so Unified Paragraph is a part of "Single Idea of Concept". Unified Paragraph consists of three parts; introduction, body and conclusion (Crossley, Dempsey, & McNamara, 2011). Due to the ability of LEPS, some of them cannot write many sentences. Therefore, we would like to apply only the concept of Single Idea to this method.

Single Idea of Concept is a basement of writing ability which helps the student not to miss his/her objective of writing by focusing one story at a time. Most of LEPS are not able to write a full form of paragraph which is required more skillful in explaining English with long sentences or many short sentences to be a paragraph. Therefore, we would like to use Single Idea of Concept to help the student to express his/her mind by not focusing on the correct form of a paragraph in order to avoid narrowing the student's idea.

For example, the student has an assignment about telling about your hobby. Single Idea of Concept will be used to help the student of what his/her hobby is. The student will be given the question relating to the word "hobby" such as "What is your hobby?", "Where do you do your hobby?", "When do you do your hobby?", "Who do you do your hobby with?", and "Why do you like your hobby?"

Then, the student can begin his/her story by answering those above questions. For example,

My hobby is playing football. I play football at garden yard. I play football after finishing school. I play it with my father. I like play football because it is fun and good for health.

Though, this is not a full form of a paragraph but it helps the student to express his idea and write more sentences about his story. Single Idea of Concept helps the student developing his/her mind with one idea in one story. It is a basic of good writing to write the story straight to the point of what he/she would like to talk about.

4. System Architecture

Developing innovative products needs a lot of time and budget consumption. If there is not good enough platform, it is very difficult to accomplish the innovative service. The current trend on research is to aim collaboration among other parties and to develop a large scale project. The management of project is to integrate all components and become a challenging task.

We propose a new web service platform named veEFL that is compliant with WS-I. WS-I is a specification for maximizing compatibility with Web Service Platforms. This platform will support Document/literal wrapped SOAP message binding style, RESTful with Token-based Authentication for easy to consumed web service, and WebSocket for two-way communication over the Internet. The system architecture and interface image show in Figure 1.

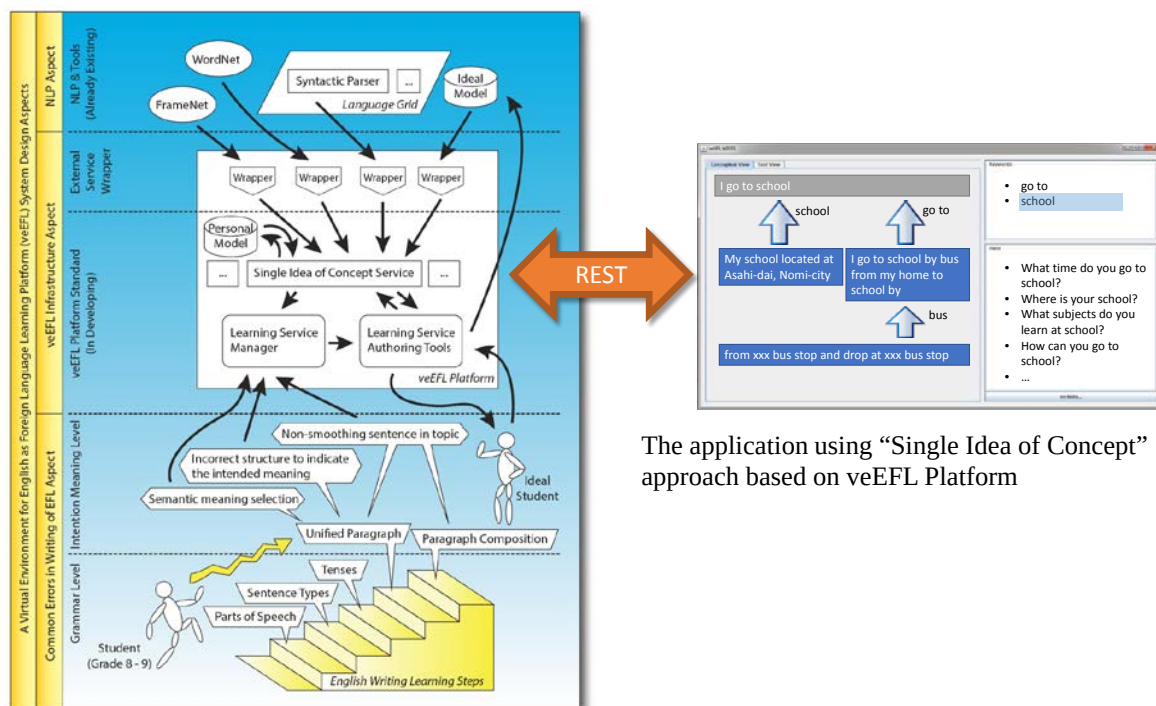


Figure 1. System Architecture and Interface Image

This system is designed by concern of 3 difference aspects as follow (1) Common Errors in Writing of EFL learner aspect (2) Infrastructure aspect, and (3) NLP aspect. veEFL is acted as a service broker to synergize all aspects together.

4.1 Common Errors in Writing of EFL learner aspect

This view point focuses on how these platforms can help Thai students who have Low English Proficiency. This is an example of applying “Single Idea of Concept” approach to resolve “non-smoothing sentence in topic” in veEFL.

English writing assignment for Thai Grade 8-9 students, the teacher often specifies writing topics for students. Writing topics will be simple open-ended questions about the life style of the students. Examples of simple assignment for English writing: “What is your hobby?”, “What do you do on your free time?”, and so on.

Though these questions are simple, most of their writings have a problem of non-smoothing sentences in a topic because of not understanding of Single Idea of Concept. To build a tool for applying a story line concept to be a single idea concept is advantage. This tool is a writing guideline as a story line. The initial concept is shown in Figure 2.

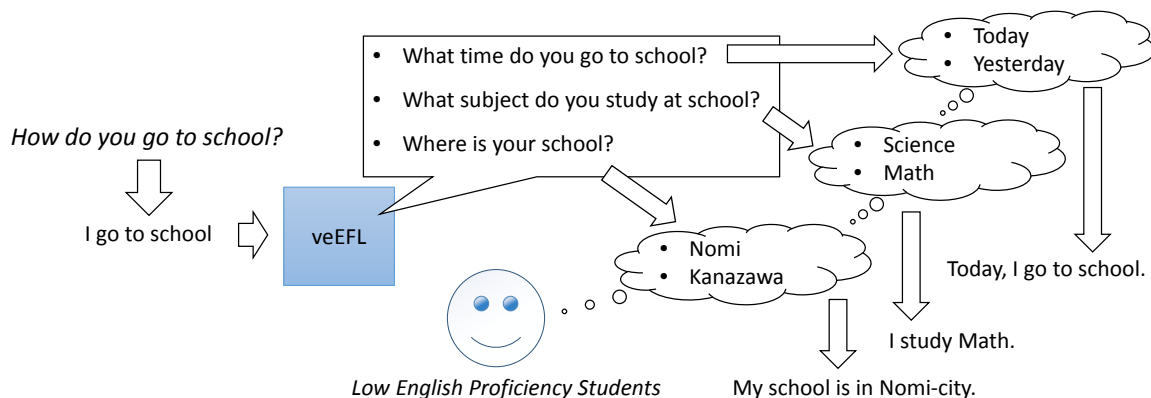


Figure 2. Example of Application for Story Line Concept as Single Idea Concept

This system will receive input and assume the first sentence as a topic sentence. For example, “How do you go to school?” The system will analyze the elements of each sentence such as “go to (v)” and “school (n)”. Then, the system will suggest the story related to the word appear in a topic sentence. In some questions, the system can give a possible answer such as “What subjects do you study at school?” This will help the students to write more detail sentences on their story.

veEFL will prepare essential web service to solve Single Idea of Concept's problem such as Syntactic Parser Web Service, Question Generator Web Service, and so on. In any case, Web service not registered in veEFL can consume external Web Service from External Service Wrapper such as WordNet Web Service, and FrameNet Web Service.

The Example of application based on veEFL Platform show in Figure 1 (in right side). The left panel is shown the conceptual dependency of initial sentence from student, “I go to school”. The top-right panel is shown the extracted keywords from initial sentence. The application can extract into 2 keywords: “go to” and “school”. The highlight on “school” keyword is an active keyword. The bottom-right panel is shown generate questions relating to an active keyword. The student will see the questions and expand his/her idea to write other sentences.

4.2 *veEFL infrastructure aspect*

veEFL is a combination of several technologies for assisting English learning. It pores on increasing Thai student's writing skill.

The basis of the system is the development of unique task based service template and sequencing them to accomplish the final objective. In the beginning phase, the initial service template would be a service for practicing basic skills such as translation service template.

The main system consists of (1) Virtual Environment Learning Platform Service Infrastructure Standard, (2) Learning Service Manager, (3) Virtual Learning Composite Workflow Builder, and (4) Learning Service Authoring Tools.

(1) *Virtual Environment Learning Platform Service Infrastructure Standard* is the one for service template on learning. It focuses on fast, simple and reusable generation of service template. The service template is designed to be connected as JSON style RESTful web service and supported to WebSocket Technology for variety of service available such as

stateful service, broadcast streaming service, real-time collaboration service and so on. (2) *Learning Service Manager* is a controlling system of service flow and user permissible activity. (3) *Virtual Learning Composite Workflow Builder* is a connecting system to compose two or more existing services into complex service. It focuses on the simplicity of usage and instant composing existing services. (4) *Learning Service Authoring Tools* are the ones for composing services as components like Rich internet application (RIA).

4.3 Natural Language Processing (NLP) Aspect

To efficiently manage the English content, NLP tools are mandatory to handle language information. A POS tagging tool and a syntactic parser are subjected to syntactic analysis while semantic information is taken care by available English WordNet and FrameNet. These tools will be used to analyze students' writing for correctness, compatible meaning and collocation of the sequence of lexical constituents.

5. Conclusion

In this paper, we propose veEFL as a new Web Service infrastructure platform. We apply the existing service platform of NLP tools with the idea of realizing a meaning of writing essay to find the connection between written content. We plan to develop a scoring system to evaluate the smoothness of topic between written sentences of LEPS, and develop a system to suggest the appropriate way on writing.

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