

Sentence Diagramming as an Effective Tool for Teaching English to Engineers

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Abstract

Teaching English to future engineers has been an ongoing struggle in KOSEN, whose students tend to score quite low on TOEIC and other standardized English tests. In an effort to improve the English performance of these students, an original take on sentence diagramming based loosely on Chomsky's generative grammar has been developed. The example sentences utilize engineering themes to increase exposure to keywords in scientific and engineering fields. The diagramming itself is taught in English thus increasing student exposure and need for the target language. Sentence diagramming was found to be a valuable pedagogical technique to encourage greater interest and learning in English classes. Sentence diagramming as a teaching method was popular in the past for teaching native students grammar but has rarely been used for ESL or EFL despite many teachers learning about grammar through the technique. However, sentence diagramming has been reexamined and modified to creating a simplified system that is meant specifically to help EFL students learn about important features and rules of grammar. Sentence diagramming as a method to teach English to engineers was shown to be a way to get otherwise disinterested engineering students interested in English grammar and help them better learn relevant vocabulary and grammar. This technique is both a grammar consciousness raising technique and a vehicle for teaching IN English. Evidence of the technique's effectiveness is anecdotal at the moment, but future research will certainly clarify its efficacy. Data to test the hypothesis will be collected after the students' exposure has been sufficient (towards the end of the school year). Thus, this research is a work in progress and definite results cannot yet be given. Though a preliminary survey of student attitudes towards the technique indicates that students find the material engaging and helpful as compared to other English classes.

Keywords: *EFL, English, ESL, Grammar, Kosen, Pedagogy, Sentence Diagramming, TESOL*

Introduction

English education has been an ongoing challenge for teachers at KOSEN, where students frequently lack motivation and/or ability as reflected in their poor TOEIC scores, often scoring even lower scores when they finish their 5 year education with a KOSEN than when they began, Tokuda et. al. (2008). The 5th year students who participated in this study had a mean score of 326 on the TOEIC before beginning the class - their last English class before exiting the system. This puts them well behind the already minimal goal of 400 on the TOEIC - a score very few students successfully achieve. It is assumed that teachers have tried many different techniques over the 8 year course of their education. However, institutionally, so far nothing has gained much traction to replace the traditional grammar translation methods generally employed. Thus most

classes are taught by non-native speakers using a grammar translation technique. This is apparently ineffective as indicated by the poor scores reported above.

As a result, the authors have decided to try a completely different approach that is rooted in both sound pedagogical theory and suitable for students with an engineering mindset and engineering ambitions. A method that should be comfortable for teachers and amenable to the larger system in which it has to be used. This technique is three-fold. Ostensibly, it is a sentence diagramming technique that is meant to raise student consciousness of English grammar. This is what is sold to the students and curriculum gatekeepers but there is a hidden idea at work, namely that the students will be learning about this diagramming IN English. This will make English both a tool for learning and the object of learning. Finally the sentences used for diagramming will heavily feature COCET vocabulary aimed at science and engineering students to improve engineering relevant vocabulary, Kameyama et.al (2011). This last point is often difficult to address as most scientific and technical English text books are aimed at students with much higher scores. It is hoped that this three-pronged teaching technique can improve the efficiency of English education in KOSEN. The technique will be more completely described below.

Pedagogy

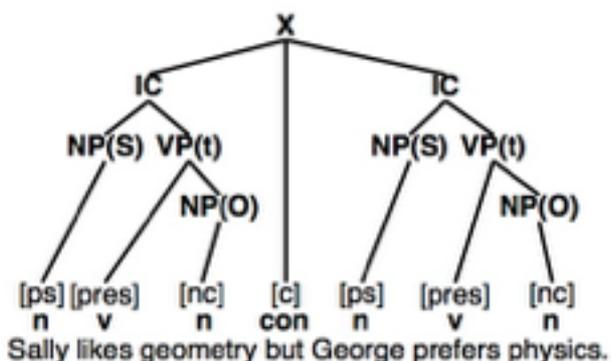
The pedagogy employed by this technique is three fold: using sentence diagramming to raise grammatical consciousness, teaching this method IN English, and using technical and scientific vocabulary in the example sentences as recommended by COCET. It is hoped that this three pronged approach will both improve upon and scaffold on the grammar translation method that is already in use in most Japanese classrooms and reinforce the vocabulary Engineering students need for success in their fields. Since Japanese teachers of English already often use many of the concepts required in sentence diagramming due to their normal grammar translation pedagogy it was hoped that both teachers and students would be comfortable with the idea of teaching and learning sentence diagramming in English and they would already have the basic knowledge needed to succeed. Also as engineering students, they likely already use other kinds of diagrams in their major course work, so they may find a certain amount of comfort in using diagrams to help them with English grammar. Sentence diagramming is also a more interactive and visual technique than grammar translation, so it will engage them in ways they have not previously used in English class but have had success with in their major course work. Let us look at each of the 3 prongs of the approach separately so that we can have a better understanding of how each works.

The first prong of the approach and around which every other portion is built, is a modified version of tree style sentence diagramming based loosely on Chomsky's X Bar theory, Chomsky, N. (1980) and as presented in Burton Roberts, N. (2011). The material was presented to the students using a textbook created by the authors, Engineering English, Grumbine, Furuike

(2016). As mentioned before it is hoped that this approach appeals to engineering students as sentence diagramming is more analytical and visual in its approach and scaffolds on the grammar translation systems to which they have already been exposed but with which they have generally had little success. The basic concepts and vocabulary presented should already be familiar to the students but the technique itself will be fresh to them. This combination, it is hoped, will allow the students to build on past knowledge and increase their motivation to learn. While the exact diagramming technique will be new, the idea of diagramming itself to make complex systems easier to understand should be a familiar exercise for them as well.

The exact system for diagramming the sentences was created by the authors with the aim of raising grammatical consciousness of the diagrammer. The first step in diagramming is to identify and label the basic grammatical building blocks of English - the parts of speech. From these blocks, the students will learn how they can be arranged into larger chunks or phrases which they will also label and see how these phrases relate to each other to form clauses and coherent sentences by using a tree style diagram. Students must label the forms (clauses and phrases), functions (subjects, objects, complements, adverbials etc), and other details (tense, voice, count, plural, etc) and their relationships in the diagram thus forcing students to pay attention to many important aspects of grammar that they might not normally pay attention to or understand. This will serve to raise students' grammatical consciousness and help them better understand common patterns of English. The rules of grammar will take on a more analytic and visual form, hopefully making this information more accessible and memorable to them. The puzzle like aspect of diagramming also makes the activity a bit more interesting and can be done in small groups, encouraging team work and the sharing of knowledge. See the diagram in Fig. 1, below for an example of a basic sentence diagram.

Fig.1.



Sentence Diagram

In the diagram above, Fig.1, students have to first label the parts of speech in the sentence with lower case letters: noun, n; verb, v; conjunction, con. Then they have to identify details associated with the words

previously labeled in brackets: proper noun, ps; present tense verb, pres; non-count noun, nc; and coordinating conjunction, c. Then they have to work top down to identify the clauses that make up the sentence and label them in capital letters, identifying the independent clauses, IC, that make up the compound sentence. Then they must identify the noun phrase, NP, and verb phrase, VP, that make up the subject, (S) and identify the predicate as transitive (t). Then they have to identify the noun phrase after the transitive verb and label it NP and identify it as the object of the verb, (O). Functions are indicated with capital letters in parentheses and predicates patterns are identified with lower case letters in parentheses. They also have to show the hierarchical structure of the sentences by connecting the parts appropriately using straight lines, showing which forms are, parents, daughters, or sisters etc.. Recognizing these relationships draws their attention to the forms, functions, and important details of a sentence that they might otherwise ignore.

The second prong of the technique is to teach the information IN the target language. The diagramming technique being new to the students is something that they will HAVE to learn in order to succeed in class. This learning is to be done IN English. This forces the students to USE the target language to acquire the skills they need to pass the tests given in class. Learning in the target language is believed to be one of the best ways to learn a foreign language, Krashen (1981). Thus the students will be both learning ABOUT English and learning IN English. This should make the learning MUCH more effective and satisfy both institutional and student expectations about English class. Since the basic concepts will be familiar to them, and the idea of diagramming is something they already have some experience with, this new information should not be too challenging for them to acquire IN English. Likewise, they will also be encouraged to ask questions in English and to produce their own original phrases and sentences in English, thus increasing their output in the target language.

The very limited and repetitive input of sentence diagramming has proven anecdotally to be a viable level of English to use in class. Few students shut down and most seem to follow what is being taught. And as the actual diagramming information is new they must maintain some focus to succeed.

The last prong of the approach is to use relevant vocabulary for engineering students as most textbooks are not geared towards this kind of student. The vocabulary employed will mostly be taken from the COCET 2600 word list, so students will be using words that should be helpful and apply directly to their more technical studies without being too difficult. This will make the lessons more relevant to their studies and match their interests and future needs.

This three prong technique is currently being used to teach all 5th year KOSEN students at the National Institute of Technology, Ariake College. The students are taught by a single teacher in groups of roughly 40 per class in 1.5 hours blocks once a week for 32 weeks with each class focusing on a particular grammar feature. The classes generally follows a regular procedure: A short review of the previous weeks work

(usually in the form of interactive Q&A). Then several example sentences presented that feature the grammar point being explored that day with students encouraged to discover the patterns and relevant details and to build on what they already know by labeling the parts of the sentence. Then the remaining “new” forms or ideas are explored and taught including any new labels and diagramming techniques. After this has been presented thoroughly, the vocabulary is reviewed. And finally the students are broken into small groups (4-6 students) to work on diagramming more example sentences. When they are finished, groups are called to the board to present their diagrams which are then examined as a class for accuracy. A short review of the important points follows and finally a quick Q&A to check for understanding. Tests are given quarterly.

Results and Discussion

After 12 weeks the students were asked to take a short 7 point Likert like attitude survey to measure how they felt about this sentence diagramming technique. The survey was presented in both English and Japanese to make sure they fully understood what was being asked of them. (Twenty additional diagramming questions were also given just to get a feel of how well the material was absorbed. This portion of the results has not yet been evaluated at the time of printing.) The relevant survey questions are given below:

Diagramming Survey

Using a scale of 1 through 7 how much do you agree or disagree with the following sentences (1= completely agree and 7 = totally disagree):

下の文章にどのくらい同意できるかを1から7の尺度で表して下さい。(1はとても同意できる、7は全く同意できない)

1. I found sentence diagramming to be more interesting than my usual English classes.

文の系図化(センテンス ダイアグラミング)は、従来の英語の授業よりも興味深いと思った。

2. I felt that sentence diagramming was more helpful than my usual English classes.

文の系図化(センテンス ダイアグラミング)は、従来の英語の授業よりも英語学習に役立つと感じた。

3. I found sentence diagramming to be more enjoyable than my usual English classes.

文の系図化(センテンス ダイアグラミング)は、従来の英語の授業よりも楽しいと思った。

4. I feel that sentence diagramming will help me with my future English studies.

文の系図化(センテンス ダイアグラミング)は、今後の英語の学習に役立つと思う。

5. I prefer sentence diagramming to other English classes.

文の系図化(センテンス ダイアグラミング)は、他の英語の授業よりも好きだ。

The results of this survey were as follows:

Total number to which the survey was given: 163

Total number of responses: 162

Total number of disregarded responses: 5 (students who gave responses other than 1-7 i.e. 0,8 or 9, etc., or who gave exactly the same answer to all questions including those not included here - it was assumed they did not give serious answers - i.e., just filled in #1 across the computer card).

Total number of used responses: 155

Mean scores: Question #1 = 2.41

Question #2 = 2.51

Question #3 = 2.00

Question #4 = 2.49

Question #5 = 2.66

These results show that the technique is thought by students to be more interesting, helpful, enjoyable, and preferred to their other English classes. Of course these are rather subjective elements of the class. Unfortunately these students are not required to take any standardized English test while they are 5th year students (they took the TOEIC test when they were 4th year students and had a mean score of 326 as reported previously). Their test scores on classroom exams has been good with a mean score of 77% with a 60% score being passing (and several students getting perfect scores) but this is not objective enough to be used as solid evidence and there is no control group so the evidence is only anecdotal at this point. Far more students are getting high passes than failing scores (high pass is 80% or better at a ratio of about 4 to 1 - in past classes it has been more like 1 to 1).

Conclusions

Sentence diagramming is mostly seen in a positive light by students, and they tend to feel that this method is more effective than those employed in their other English classes. Employing the method should not be too difficult for most teachers who already have a strong grasp of grammar and are familiar with the relevant vocabulary. The current largest stumbling block is the availability of ready made teaching materials and basic experience with the technique. To fill that void the authors are working on a textbook that is currently in beta form and was used in all the classes in this study. But the findings in this research are mostly anecdotal so further study will be required to appraise the true objective effectiveness of this 3 pronged technique. Such research and the required testing is planned for the near future.

Acknowledgements

The authors would like to thank the students, faculty, and staff of Ariake National College of Technology for their patience and goodwill in regards to this project.

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