APPLYING TREE DIAGRAM PROGRAMS IN TEACHING SYNTAX DURING ONLINE LEARNING

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ABSTRACT

During pandemic, teachers and lecturers were trying to make learning process effective through online platforms and programs. Thanks to the technology that it offers a lot of platforms supporting educators in performing the learning process. Technology also helps in teaching syntax which needs a lot practice including creating tree diagrams of sentences to parse each contituent that requires a platform or program that can lead the students to diagramming. Therefore, this study focused on the effectiveness of applying tree diagram programs in teaching syntax, specifically tree diagrams editor, during online learning. The study used observation and assessment to see whether the use of this program worked to students' comprehension and motivation. Through lectures, quizzes, and practices, the study found that the use of tree diagram editor was effective to teach syntax during online as it offers practical use, editable sections, and export tool that ease the students to submit their quizzes and examination.

Keywords: Syntax, diagramming, tree editor, online learning

INTRODUCTION

Conducting teaching and learning process in this pandemic era has been another challenge that has to be faced by teachers, lecturers and students. The educators then have to creatively think of effective ways as to keep the process of learning run well despite some hurdles compared to direct or face to face learning process. Thanks to technology that it provides abundant applications that can help lecturers-students' interaction during the virtual learning. In this article, the author focussed on how to apply parts of the technology sophistication in teaching syntax.

Syntax is the study of how sentence is structure. Chomsky (1966, p.1) said that syntax is the study of the principles and process by which sentences are constructed in particular languages. Radford (1997, p.1) also conveyed that syntax is concerned with the ways in which words can be combined together to form phrases and sentences. This means that syntax focuses on how sentences are constructed through some elements which are called phrases.

Studying syntax is tightly correlated with the tree diagrams which shows how sentences are built and organized to become thoughtful and meaningful. In this course, students learn how to parse sentences into several lexical elements and apply them to tree diagrams. It can be imagined that this is quite hard for lecturers as well as the students how to virtually draw the tree diagrams as one of the core of syntax course. This study then tried to formulate three questions to be investigated through 12 meetings of syntax course. The questions are: what are the possible syntax tree applications used in virtual learning? How do the applications help enhance the teaching and learning process? How do the applications help students' achievement during virtual learning? These three questions have been previously thought by the researcher prior to start the course and have designed some assignments to do in twelve meetings.

THEORETICAL FRAMEWORKS

Syntax

Syntax is the study of how words are organized in a sentence. It is stated above that Chomsky (1966, p.1) defined syntax as the study of the principles and process by which sentences are constructed in particular languages. English syntax discusses about the system of rules and categories that allows words to be combined to form sentences (Wafi, 2019). Syntax is the component of a grammar which determines how words are combined together to form phrases and sentences (Radford, 2004, p.405). Then, syntax is primarily concerned with word order in a sentence and with the agreement of words when they are used together. In other words, syntax is the study of the rules that must be followed to create well-formed phrases, clauses and sentences.

Phrase Structure

Wren and Martin (2000, p.2) in Majid Khoirul (2015) said that a phrase is a group of words which makes sense but not complete sense. The category of a phrase depends on its construction or words that a phrase comprises. Phrases are divided into various types depending on the head word it contains; noun phrase, verb phrase, adverb phrase, adjective phrase, appositive phrase, infinite phrase, participle phrase and gerund phrase. Radford (1988, p.167) stated that a phrase is classified into five categories; Noun Phrase (NP), Verb Phrase (VP), Prepositional Phrase (PP), Adverbial Phrase (Adv P), and Adjectival Phrase (AP). Kinds of phrases depend on the head of the word in the collection of the words. Every sentence has own structure built from several constituents with the rule; S for *Sentence*, NP for *Noun Phrase*, VP for Verb Phrase, ApP for adjective phrase, AP for adjective, PP for prepositional phrase, AdvP for adverbial phrase, Det for Determiner, Aux for Auxiliary (verb), N for Noun, and V for Verb lexical item.

      a. Noun Phrase (NP)

Category of Head Word [1]	Examples [2]
Noun (count)	*Students* have a lot of ideas
Noun (non-count)	*Water* is vital to human beings
Subject and object personal pronoun	*We* love *him*
Genitive personal pronoun	*Yours* is better
Indefinite pronoun/quantifier	*Nothing* was left
Wh-word/pronoun	*Which* is your phone?

      b. Verb Phrase (VP)

This phrase comprises min verb, auxiliaries (depending on the tense applied), complements (optinal, depending on the types of the verb, which can be transitive, intransitive or dwitranstive), other modifiers or adjunct.

      c. Adjective Phrase (AP)

This kind of phrase functions as an adjective in a sentence which an adjective phrase is a group of words that functions like an adjective in a sentence.

      d. Adverb Phrase (AdvP)

An adverb phrase might contain adverb alone as the head of the phrase or the addditonal of other lexical categories (preposition, noun, verb, modifiers).

      d. Prepositional Phrase (PP)

A prepositional phrase is collection of words preceeded by preposition followed by noun or object like pronoun or other noun formations and other modifiers.

Generative Grammar

Syntax and grammar are related to the rules of formation of sentences. Both the knowledge concern in making a good phrase, clause, and of course making a correct sentence. Syntax refers to the way words are organized structurally to form phrases, clauses, or sentences while grammar concerns with sets of rules related to the structure of a language including morphology. Generative grammar is a theory of grammar that holds that human language is shaped by a set of basic principles that are part of the human brain. This theory includes several theories that employ syntax trees (Chomsky, 1965). The publication of Syntactic structures has made a revolution in linguistics. Chomsky developed a theory known as Transformational Generative Grammar (TGG) because of its aim of constructing a device that would generate all sentences of the language(Chomsky, 1957, p.13). The term generative syntax originted from Chomsky's Syntactic Structures on researches about natural language syntax within the framework of generative grammar.

Tree Diagrams

It would actually be easier for learners as well as lecturers to draw the tree diagrams of sentences with hands. But, how if they want to publish it in a paper? Hand-drawn tree diagrams are not quite suitable for publications. Then, it would be better and readable if syntax learners make it in a tree diagrams with a program or software which can be downloaded. Therefore, in this study, the researcher would like to emphasize the importance of applying tree diagrams programs or applications to generate tree diagrams when analyzing sentences in order that the tree diagram programs help learners in some ways.

Tree diagram is a way to elaborate lexical items in a sentence and to represent the syntactic structure of a phrase or sentence (Radford, 2009, p.483). Syntactic tree diagram can be said to be a good apparatus to represent the internal structures of phrases and clauses. Through diagramming, learners would be easier to see whether they have built correct sentences. But, it has to be emphasized that learners would not be able to generate well-formed syntax tree unless they have previously known the X-bar theory. X-bar theory was first proposed by Noam Chomsky in 1970 which then established by Ray Jackendoff in 1977. The X-bar theory was incorporated into both transformational and nontransformational theories of syntax. It is shown in the X-bar theory that each phrase comprises a head and it may contain phrases functioning as a complementizer or specifier. The example of X-bar theory can be seen in the following.

Virtual Learning

Due to pandemic which has been an outbreak since early 2020, schools and universities were stopped running face to face and altered by virtual learning. Virtual learning is a learning process which is conducted through or by using computers and/or the internet both outside and inside the facilities of the educational organization. This learning process is generally conducted in a virtual way where all the activities are conducted not face to face but it is done in virtual meeting without having to physically meet. In this setting, educators and learners does not interact physically in terms of place, time, or even for both of settings. Virtual education has been running for several months since the pandemic of Covid-19. However, educators and learners or other related field have to be creative and innovative instead of giving up to this situation . It has been a big

challenge for both educators and learners to make this virtual learning bears fruit despite its abundant shortages that could appear during teaching and learning process. In virtual meeting, there are several platforms that can be used to support learning process like *zoom* or *google meet* in order to keep the course running well.

METHOD
This study applied a qualitative descriptive methodology (Djajasudarma, 1993), which employs substitution and reference techniques. The research started from the week one to week 12 where students first learned syntax virtually. The writer used descriptive qualitative method to make description accurately and systematically. To collect the data, the writer did these steps;

      1. Giving theories about syntax
      2. Virtually guiding students to install Syntax tree editor
      3. Assigning the students to analyze sentences using tree diagrams
      4. Observing students' ability in analyzing the sentences in several   assignment
      5. Analyzing students' ability in the tree diagrams using Syntax tree editor
      6. Analyzing the use of the significances of Syntax tree editor during and after the course.

The respondents of this study are the 40 students of their fifth semester who took Syntax course in Widyatama University, Bandung, Indonesia. They were new learners of syntax and they have just got the course this semester. They have not learnt syntax in their previous semesters. Then, in this case, they were beginners or new learners of syntax. The procedure of the reseach is done through observations for twelve weeks by giving theories of syntax and other guidance related to syntax tree diagrams. The topics they learnt were taken from syntax module compiled by the Syntax lecturer. The topics are listed in the following.

Table 1 Meeting Schedule

Meeting	Topic	Method
Week 1	Introduction of Syntax	Synchronous
Week 2	Syntactic Category and Constituents	Synchronous
Week 3		Asynchronous
Week 4	Phrase structure including head, modifier, and	Synchronous
Week 5	complement.	Asynchronous
Week 6		Synchronous
Week 7	Complement and Adjunct comprising subject complement, object complement, adjective complement and adjunct	Asynchronous
Week 8	Complement Clauses: students will be able to analyze complement clauses by drawing a tree diagram	Synchronous
Week 9	The Internal Structure of Phrase	Synchronous
Week 10		Asynchronous
Week 11	Functional Categories and More on Sentence	Synchronous
Week 12	Structure	Asynchronous

There are actually 16 meeting for this course, 12 meetings for theories and practice, 2 meetings for mini research project and 2 weeks for final exam. During these weeks, the learners were guided to understand syntax and how to diagramming with the hope that the students are able to apply their knowlege to make a journal or mini-research after the completion of the lecture. To answer the three research quesitons, the researcher would gave questionnaires which related to whether the applications help enhance the teaching and learning process and how the applications would help students' achievement during virtual learning.

FINDINGS AND DISCUSSION
The first assignment which was given is to analyze two simple sentences after guiding them with theories of syntax based on the syllabus and the way to draw tree diagrams virtually. Here is the representative work. In this analysis, the student was able to draw a tree diagram of two sentences.

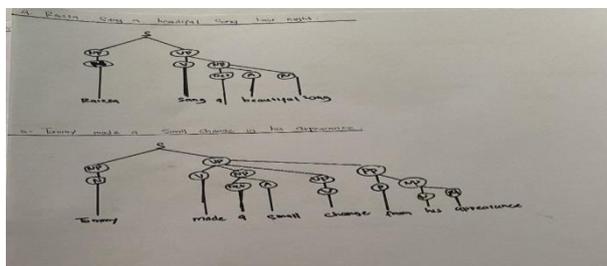But, the problem is the readiblity of the analysis is very low.

Figure 1: Representative assignment of hand-drawn tree diagram

Seeing this result, the writer tried to experiment some of tree diagram programs or platforms which can support the virtual teaching – learning session. It can also be imagined how they will make the tree diagrams if the work they have done needed to be published. Then, with some considerations of the easiness, menu offerred, and other benefits, the choice then fell into a platform named 'Syntax tree editor'.

Syntax Tree Editors

Syntax tree editor is a tool that is used for drawing syntax tree diagrams. Syntax Tree Editor is primarily the work of Jeff Epstein and Edmund O'Neill. This platform is designed based on the need of syntactician or other users like teachers, lectures, students, or other researchers related to syntax fields. This program can be downloaded from http://www.ductape.net/~eppie/tree/ and the tutorial of installing this application can be seen from https://www.youtube.com/watch?v=WQcVJGxSpyw. It is said that Syntax Tree Editor can be freely downloaded and should work on any computer running a reasonably recent version of the Windows operating system (XP, Vista, 7). This platform became the best choice for some reasons. The easy application, various tools it offers, tidy results students can download and readible result which can be used for publication are among the reasons that the researcher should suggest using this application for students especially for those who just learn syntax. The following pictures will guide the learners of the usage of this application.
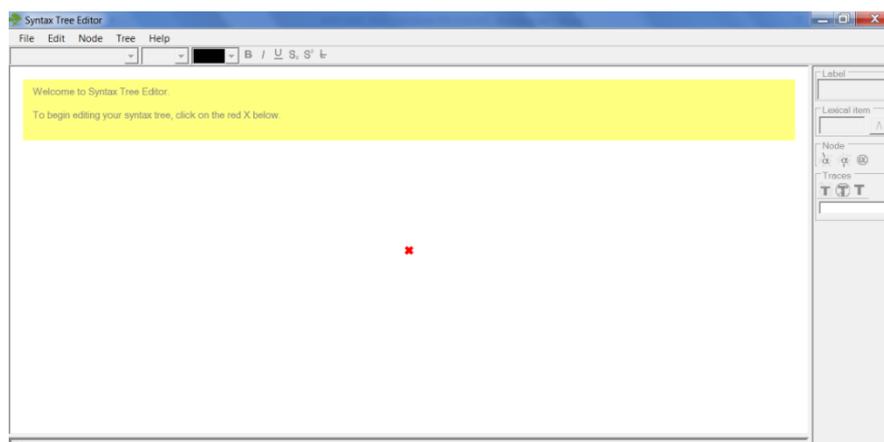

Figure 2: Screen capture of blank worksheet of Syntax tree editor

There are five menus offerred by this platform which can be used by the users to ease them to draw tree diagrams. They are **file**, **edit**, **node**, **tree**, and **help**. Each menu consists of several instructions which guide the users to use this platform. Tree diagrams editor is a platform of syntax which aims to help syntax learners easier to draw tree diagrams of a sentence. By following the

steps in the application, the users will be able to generate the trees based on the assigned or proposed sentences. Syntax trees generally have three structures, they are 'Non-terminal' nodes which are called internal nodes of the tree. The second is called 'Terminal' nodes functioning as the leaves in the tree diagrams. The third is called 'Triangles'nodes which are usually used to shorten the tree diagrams elaboration or to show that the next structures are unelaborated or unknown.
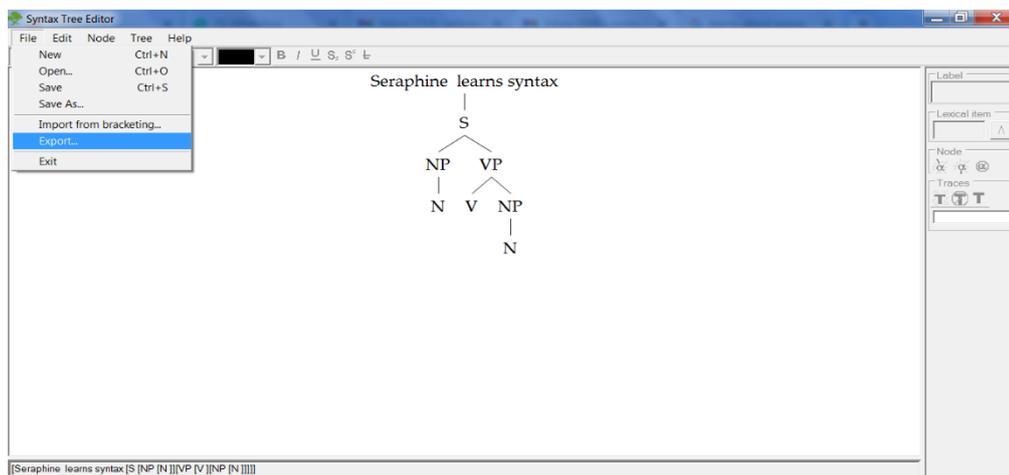

Figure 3: Screen capture of sentence analysis of Syntax tree editor which is ready to be exported to JPG

The picture in figure 2 shows one of the important parts of Syntax tree editor. In this figure, the analysis of sentence in tree diagram is ready to be exported and saved in *JPG* format which then eases the users to copy and paste it to other work sheets like Microsoft word or other media. This is one of many benefits students can take from using Syntax tree editor. This format can be used if the users want to publish their work or research. By clicking the 'file' menu, the users will find 'export' instruction, then choose any intended folder, choose the 'export', and the result can be seen as follow.
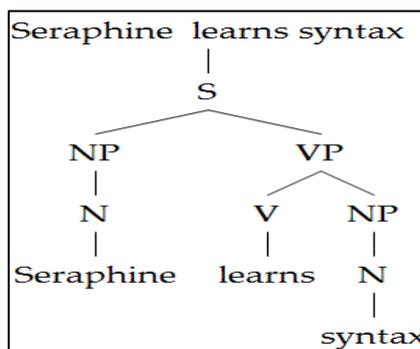

Figure 4. Export result of tree diagram from Syntax tree editor

After being exported and saved, the tree diagram is ready to be copy-pasted to intended worksheet. Then, from this algorithm, it can be said that using Syntax tree editor is easy to use especially for beginner learners who just studied syntax and also for those who wanted to publish their work related to syntax tree diagrams.

Relevance of Applying Syntax Tree Editor during Teaching and Learning Process
The application of syntax tree editor is relevant to this course especially for those who just started to learn syntax. The theory of X-bar is also relevant to be applied using this platform for its likeness and easiness to learn. This platform is also used to guide the students in doing weekly

quiz and assignment. To see whether this application meets the students' need in learning the course, the writer questionaires at the end of meeting. The result of the questionaires can be seen below. From 40 students as the participants of this course, there are 30 students who fill the questionnaires. The rest students are not active and are not able to be contacted and maybe unwilling to filled the questionnaires.

Table 2. Questionnaires about the application of Syntax Tree Diagram

Num	The application of Syntax Tree Diagram	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
A1.	The menu offered by Syntax tree editor is in line to the materials learnt during syntax course	10	14	6	0	0
A2.	Syntax tree editor is easy to use	11	14	4	0	0
A3.	Syntax tree editor is beneficial for publication related to syntax tree diagrams	11	15	3	1	0
A4.	Syntax tree editor should add more menus	14	13	3	0	0
A5.	Syntax tree editor is relevant in learning syntax during virtual	9	14	6	2	0

To survey whether this application is suitably used during teaching and learning process, the researchers gave 5 questions related to the benefit of using syntax tree diagrams. From the data, it can be seen that the students gave positive responses to the application of sytax tree diagrams. To the first questions, *the menu offered by Syntax tree editor is in line to the materials learnt during syntax course,* 33% respondents strongly agreed to the relenvance of material to the use of the application and 47% agreed. To the second questions, 38% strongly agreed that the application is easy to use, 48% agreed. There were 14% students who responded neutral. To the rest responses, they majorly responded positively 'strongly agree' above 30% and 'agree' above 40%. This means that the application is suitable to use to learn syntax and relevant to use during virtual learning and teaching process.

Table 3. Skill and responsiveness of using tree diagram editor

Num	Skill and responsiveness of using tree diagram editor	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
B1.	Syntax tree editor helps students draw diagrams	13	15	1	1	1
B2.	Syntax tree editor improves students' motivation in learning syntax	7	14	7	2	0

B3.	Syntax tree editor improves students' ability in learning syntax	9	14	4	3	
B4.	Syntax tree editor assists students' in doing assignment during virtual meeting	10	13	3	3	1
B5.	Syntax tree editor enhances students' confidence in sending their work to the publication	9	10	7	3	1

To review about the relevance of this program to the improvement of students' ability in understanding syntax, the researchers gave 5 questions as can be seen in the above table. From the data, it can be concluded that students also gave good responses in which they respond in 'strongly agree' and 'agree' option. The questions were about skill and responsiveness of using tree diagram editor. In this finding, syntax tree editor helps students draw diagrams because 44% strongly agreed and 50% agreed. The rest reponse was not really sginificant, 3% neutral and 3% disagree. The second question is quite spread because 23% strongly agreed that *Syntax tree editor improves students' motivation in learning syntax*, 47% agreed and 23% was neutral. The 'neutral' response factor is still the reseacher's concern in future study, to see what makes students motivated to learn syntax and other subjects.

From overall students' responses, it can be concluded that syntax tree diagram is significant to be used in virtual meeting as it helps students increase motivation in learning syntax, improve their ability, assist them in doing assignment and designing a mini-resesach about syntax. Despite some 'neutral' respose, 'strongly agree' and 'agree' responses still dominate which means that this tree generator is useful to be applied in learning process.

Relevance of Applying Syntax Tree Editor to the Final Examinantion
After observing the students for twelve meetings by giving theories and assignment, it can be said that this platform is beneficial for students The final assignment which is given to the students during this virtual syntax course is a mini research. In this mini-research, the students are assigned to make up one topic from the theories given and make some analysis to the data they have taken using Syntax tree editor. The result can be seen below.

Datum 1
Kevin Indira Putra Ndun (0718101003). He tried to make a mini research entitled *Syntactic Analysis on Two Different Poems from Two Different Era.* In this study, he used Syntax tree editor as the tool to draw tree diagrams. Here is one example of the analysis he made which was taken from traditional poem 'entitled 'Love One Another' written by Khalil Gibran.

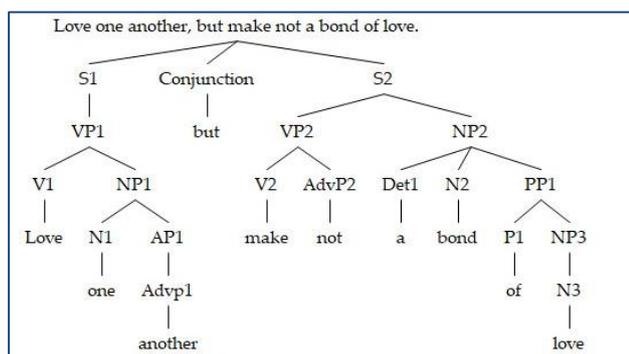*Love one another, but make not a bond of love.*

Figure 5. Export result of tree diagram from students' final exam

From this representative analysis, it is shown that the student is able to analyze compound sentence and draw it in tree diagram using Syntax tree editor.

Datum 2

This datum was taken from the result of mini-research done by Salsabilla Fahira Puteri (0718101001), Audry Andari Chairunnisa (0718101004), and Tiara Ajeung Pradani (0718101024) entitled *The Analysis of Poem "Cat" By Mary B. Miller: A Syntactic Study*.
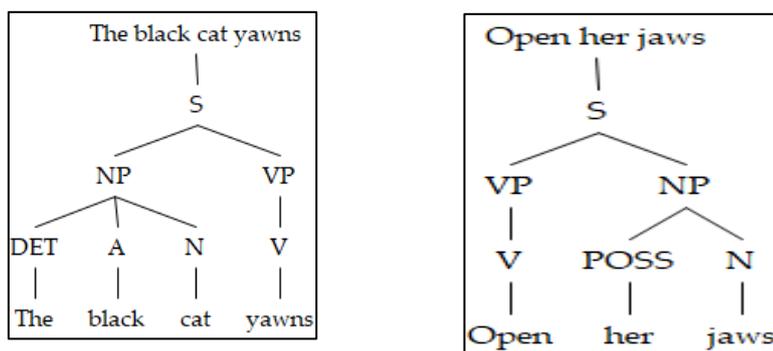

Figure 6. Export result of tree diagram from students' final exam

This study which was conducted in group shows that they have been able to analyze simple sentence wth correct phrase structure. The students are also be able to analyze imperative sentence with its constituent.

Datum 3

The third datum was taken from a research conducted by Andrin Dellani Ratnadeva R (0718101035), Anita Rahayu (0718101040), Brenda Puspitawening (0718101013), Denira Rahma Utami (0718101039), Nurul'Aini Garniansyah P (0718101041) which is entitled *A Syntacticl Analysis Of Sentence Patterns In The Short Story "Tales From The Arabian Nights : The Genie In The Bottle"*.
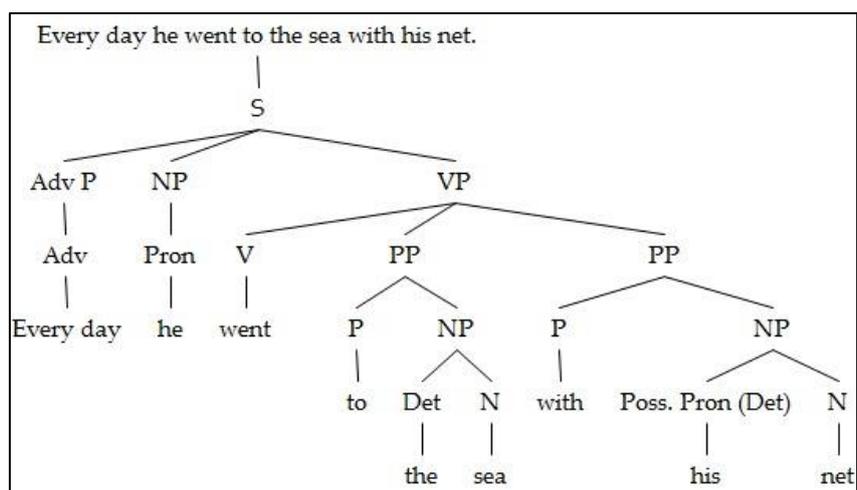
They analyzed that the pattern of the sentence is:

S → Adv P + NP + VP

➔ **Adv + PRON + (V + PP + PP)**
➔ **Adv + PRON + (V + (P+NP) + P+NP))**
➔ **Adv + PRON + (V + (P+ (DET+N) + P + (POSS PRON + N))**

Based on the diagrams, the sentence "everyday he went to sea with his net" consists of AdvP (everyday) plus NP (he) plus VP (went to the sea with his net). AdvP consist of Adv (everyday). NP consist of PRON (he). VP consist of V (went) plus PP (to the sea) plus PP (with his net). PP consist P (to) plus NP (the sea). PP consist P (with) plus NP (his net). NP consist POS. PRON (his) plus N (net).

This analysis shows that the students, in addition to being able to draw tree diagrams with syntax tree editor, are able to analyze how to parse the sentence, elaborete them and give correct naming to each parts which is seen through their analysis.

CONCLUSION

The effectiveness of teaching and learning process during pandemic has been educators' responsibility and responsiveness to find out certain applications or programs which help students' comprehension of materials and motivation to keep productive despite some lackness of online learning. Tree diagram editor is proven to be one of effective ways to teach syntax as it gives a lot of benefits to the students. There are some reasons for lecturers to use this platform, they are; the easiness of application, the varieties of tools it offers, the tidy results students can download and the readibilty to be used for publication. However, the students needs to first understand how to parse each constituent of a sentence prior to use this application. The students or learners have to be provided some guidance in the analysis of sentences. Then, this application is beneficial for those who want to do some research on syntax, to students who wants to complete their assignment tidily, and to some researchers who want to conduct more studies on syntax. The good news of applying syntax tree diagrams is that the programs work on both virtual and face-to-face learning process. Then it is suggested that lecturers and students can use the programs to enhance teaching and learning process. Further studies are expected to be conducted to research about other possibles tree diagram programs that might be more easily used by learners especially advanced learners.

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