

English student's issue on constructing tree diagram sentences

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Abstract

This research aims to identify the key difficulties students face and develop strategies to enhance their understanding of tree diagrams. The purpose of this research is to identify the specific difficulties students encounter when understanding and constructing tree diagrams and to develop recommendations for improving teaching practices based on the analysis results. The researcher focuses on the discussion at the class to obtain qualitative insights into students' experiences and challenges in constructing the tree diagram, gather the data on student's answers on the test, and assess the accuracy of students' tree diagrams and identify common errors from collected student work samples. The results of this study revealed that English language students make a range of errors when constructing and interpreting syntactic tree diagrams. These errors were classified into five main categories: hierarchical misplacement, grammatical mislabeling, incorrect phrase segmentation, visual representation issues, and task completion problems.

Keywords

English Students, Tree Diagram, Sentence

Introduction

Syntactic analysis plays a vital role in understanding the structure of languages, particularly in the field of linguistics and English language studies. Tree diagrams are one of the most significant tools used in syntactic analysis to visually represent the hierarchical structure of sentences. By using tree diagrams, students can grasp the relationships between words, phrases, and clauses, thereby improving their understanding of grammatical rules and sentence construction. However, despite their importance, many English students encounter significant challenges in constructing and interpreting tree diagrams, which can hinder their overall learning and application of syntax. This research seeks to explore the specific difficulties faced by English students in using tree diagrams, examine the link between their comprehension of syntactic concepts and their diagramming skills, evaluate teaching methods, and propose actionable recommendations for educators. To provide a solid foundation for this research, it is essential to review relevant literature, theories, and educational practices.

Tree diagrams are graphical representations of syntactic structures that require a strong understanding of grammar, syntax, and hierarchical relationships. Students often struggle with various aspects of these diagrams due to some reasons. The first reason could be a Complexity of Syntax Rules: Syntax involves a multitude of rules and principles, such as phrase structure rules, transformations, and agreement constraints. Students frequently find it challenging to memorize and apply these rules correctly when creating tree diagrams. The second reason is an Abstract Nature of Syntax: Syntax operates at an abstract level, where concepts like nodes, branches, and phrase labels (e.g., NP, VP, PP) need to be understood and visualized. For many students, translating abstract ideas into concrete diagrams is a daunting task. The third one is Misconceptions and Errors: Common errors include mislabeling nodes, misplacing branches, and failing to account for hierarchical relationships. Such errors may stem from incomplete or incorrect understanding of grammatical rules. This can overwhelm students, particularly those new to the subject. Studies have shown that these challenges often lead to frustration and disengagement among students, emphasizing the need for targeted instructional interventions.

Tree diagrams serve as both a tool for analysis and a medium for applying syntactic knowledge. The ability to create and interpret tree diagrams depends on a student's understanding of syntax. Key aspects of this relationship include: 1) Foundational Knowledge: Students who have a solid grasp of basic grammatical concepts, such as parts of speech, phrase types, and sentence structures, are better equipped to construct accurate tree diagrams. 2) Deep vs. Surface Understanding: Students with a deeper understanding of syntactic concepts are more likely to apply them effectively in tree diagrams. 3) Transfer of Knowledge: The ability to transfer theoretical knowledge to practical tasks is a critical skill in language studies. For instance, understanding that a noun phrase can function as a subject or object must translate into correctly diagramming sentences with varied structures. Encouraging students to reflect on their thought processes can enhance their understanding and application of syntax.

In the study of linguistics and language, understanding sentence structure is critical. Tree diagrams, also known as parse trees, are a fundamental tool used to represent the syntactic structure of sentences. They visually depict the hierarchical relationships between different components of a sentence, such as phrases and clauses. This representation helps students grasp how sentences are constructed according to grammatical rules. However, students often face significant challenges when learning to interpret and to create these diagrams. This proposal aims to investigate the specific difficulties Universitas Pamulang (UNPAM) English Literature students encounter with tree diagram sentences, analyze their root causes, and propose strategies to address these issues.

Learners make errors due to their lack of knowledge in mastering the second language, making it difficult for learners to immediately correct those errors. In simple terms, errors arise because learners lack competence in the second language. Thus, error analysis is an effort to analyse linguistic errors that focus on the learners' side, not just the second language side (Khansir, 2012). Several factors contribute to these difficulties. Firstly, the abstract nature of syntactic theory can be daunting. Students must grasp various grammatical categories, such as noun phrases (NP), verb phrases (VP), and their functions within different sentence structures. This requires a solid understanding of not only basic grammar but also more complex syntactic rules, which can be overwhelming for learners. Moreover, constructing tree diagrams involves spatial reasoning skills. Students need to visualize and to map out the hierarchical structure of sentences on paper, which can be particularly challenging for those who struggle with spatial tasks or who are unfamiliar with the conventions of tree diagram notation. For example, distinguishing between different levels of hierarchy, such as main clauses versus subordinate clauses, requires both conceptual understanding and spatial organization.

Another significant challenge is the gap between theoretical knowledge and practical application. While students might learn the theoretical aspects of syntax and tree diagrams in class, applying this knowledge to accurately construct diagrams is often more difficult. This practical difficulty can be worsened by variations in sentence structures, including simple, compound, complex, and compound-complex sentences, each of which requires a different approach to diagramming. Additionally, English syntax itself can be complex and varied, adding to the difficulty. English sentences can be constructed in numerous ways, and students must be able to adapt their understanding to accommodate different structures. This complexity can lead to confusion and errors when students attempt to represent sentences using tree diagrams. This research aims to address the following specific objectives:

1. What types of errors do English language students make when constructing and interpreting syntactic tree diagrams?
2. What do these errors reveal about students' understanding of syntactic structure and constituent relationships?

Method

In line with the purpose of qualitative research focused on elaborating the first semester students of English sentence structure such as: phrase, clause and sentence in line with language comprehension focuses, this research will use descriptive qualitative method. According to Gay (2006) who said that qualitative research is the collection, analysis, and interpretation of comprehensive narrative and visual data in order to gain insights into a particular phenomenon. On the other hand, Bogdan & Biklen (1982) said that qualitative research is research which investigates the quality of relationships, activities, situations, or materials.

Qualitative and descriptive research is well suited to this study were conducting tightly controlled experimental research is possible. The terms qualitative research and descriptive research are sometimes used interchangeably. However, a distinction can be made between the two. One fundamental characteristic of both types of research is that they involve naturalistic data. According to Bogdan & Biklen (1982), the descriptive method is a method that examines the status of human groups, an object, a set of conditions, a system of thought or a class event in the present. The purpose of this descriptive study is to make a description, description, or painting systematically, factually and accurately of the facts, the characteristics and the relationship between phenomena investigated.

The Study Design

Tree diagrams, often used in linguistic analysis, derive from generative grammar; a theory pioneered by Noam Chomsky. Chomsky's groundbreaking work, *Syntactic Structures* (1957), laid the foundation for understanding sentence structure through hierarchical representations (Chomsky, 1957). Chomsky introduced the concept that sentences are generated from a finite set of rules, known as grammar, which define the structure of language. Tree diagrams serve as a visual tool to represent these syntactic structures, providing a clear method to decompose and analyze complex sentences into their constituent parts.

The evolution of generative grammar has seen significant shifts, most notably with the introduction of the Minimalist Program in the 1990s. Chomsky (1957) proposed that language could be understood through a simpler set of principles and parameters, focusing on the efficiency and economy of syntactic structures. The Minimalist Program aims to explain language phenomena with the least amount of theoretical machinery, highlighting the inherent simplicity of the human language faculty. Understanding and constructing tree diagrams requires advanced cognitive skills, including spatial reasoning and memory. Cognitive science has explored how individuals process and interpret complex visual information, emphasizing the role of spatial abilities in tasks like diagram construction.

Recent empirical studies highlight various challenges that students encounter when working with tree diagrams. Uspayanti, Syarifuddin, and Sakka (2022) investigated the difficulties students face in analysing sentence structures using tree diagrams and found

that learners frequently struggle with visualizing hierarchical relationships and applying grammatical rules accurately. Their study revealed that many students have difficulty understanding how to represent abstract syntactic relationships, often due to limited spatial reasoning and unclear conceptualization of grammatical categories. These issues result in frequent misplacements of constituents, improper labelling, and incorrect phrase boundaries.

Similarly, Faraj (2023) explored the gap between theoretical knowledge and practical application among EFL learners constructing tree diagrams. His findings show that while students may be familiar with syntactic theory, translating that knowledge into accurate tree structures remains a significant challenge. This disconnect emphasizes the need for pedagogical approaches that better link theoretical instruction with hands-on diagramming skills. Faraj also suggests that incorporating more visually accessible teaching tools could support students in representing complex sentence structures, thereby enhancing both their syntactic awareness and analytical accuracy.

In this study, student errors in constructing and interpreting syntactic tree diagrams were analyzed using a coding scheme developed from both foundational and context-specific sources. The error analysis approach follows Corder's (1974) model, which emphasizes the importance of identifying, classifying, and interpreting learner errors. The typological framework integrates classical categories such as omission, addition, and misformation (Dulay et al., 1982; James, 1998), while more specialized categories were adapted from empirical studies on syntactic analysis tasks in EFL contexts. These include constituent misplacement, incorrect word-category identification, node labeling errors, violations of phrase structure rules, and hierarchical misinterpretation (Uspayanti et al., 2022; Marpaung et al., 2025; Faraj, 2023). This combination allows for a systematic yet contextually grounded examination of student difficulties in syntax learning.

Table 1. Classification of Common Student Errors in Syntactic Tree Diagram Construction

Error Category	Description / Source
Constituent placement errors	Mis-placing nodes or branch structure, is common in phrase/sentence tree diagrams.
Incorrect word-category identification	Mis-labeling POS or phrase type study as most frequent error (e.g., NP vs VP).
Node labeling errors	Labeling nodes incorrectly (e.g. misidentifying head components).
Phrase-structure violations	Violating core hierarchical rules, observed misuse of rule-based structure at PP and clause boundaries.
Hierarchical misplacement or misinterpretations	Difficulty placing determiners, auxiliaries, phrase hierarchy, underlying syntactic misunderstanding

The study of tree diagrams in linguistic education encompasses a range of theoretical and practical considerations. From the foundational work of Chomsky to recent innovations in teaching methods, understanding tree diagrams involves both cognitive and educational dimensions. Challenges such as spatial reasoning difficulties and cognitive load need to be addressed through effective instructional strategies and visual enhancements. Error analysis and remediation strategies provide valuable insights into common mistakes and ways to improve diagramming skills. Integrating theoretical knowledge with practical application is crucial for helping students develop a deeper understanding of syntax.

Innovations in educational technology and diagram representation offer promising avenues for enhancing student learning and engagement. Future research will continue to explore these advancements and their impact on language education. By addressing the identified challenges and leveraging recent developments, educators can better support students in achieving proficiency in syntactic analysis and tree diagram construction.

The Sample Population

This research will be conducted in Universitas Pamulang (UNPAM), specifically in the English Literature Program. The data of this research will be taken from the students' 2nd year works in Morpho-Syntax classes. The participants consist of the third semester students. The researcher considers this situation because the students have completed Basic Grammar, Intermediate Grammar, and Upper Intermediate subjects. The students have different background knowledge in the English language, but they are having the same interest in English. This research will be organized in six months' lengths and the result of this research will be generalized as the English sentence structure ability of students of English Literatures.

Results

The analysis of student errors in constructing syntactic tree diagrams reveals patterns particularly in five key error categories: constituent placement errors, incorrect word-category identification, node labeling errors, phrase-structure violations, and hierarchical misinterpretations.

Constituent Placement Errors

One of the most frequent error types identified in the students' tree diagram constructions was *constituent placement error*. This type of error occurs when branches or nodes are positioned incorrectly within the hierarchical structure, resulting in misrepresentation of syntactic relationships. Such errors often emerged in the analysis of more complex sentence structures, particularly those involving auxiliary + main verb sequences, coordinated verb phrases, or multi-level phrase embedding. Misplacement frequently reflected a deeper conceptual difficulty in determining which lexical or functional elements should fall under a particular syntactic head, as well as challenges in

visualizing the correct hierarchical arrangement. These findings align with Uspayanti et al. (2022), who noted that learners often struggle with recognizing appropriate phrase boundaries and accurately grouping elements within a syntactic tree.

To illustrate how these constituent placement errors manifest in actual student work, the following example presents a sentence from the dataset alongside its corresponding tree diagram, highlighting the specific structural inaccuracies and labeling mistakes made by the learner in the sentence *She loves to write and share stories*.

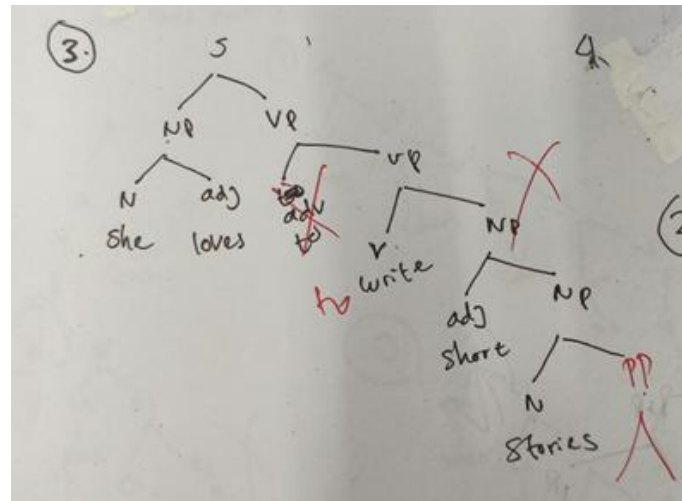


Figure 1. Constituent Placement Error

An illustrative example can be seen in the sentence *She loves to write and share stories* (see Picture 1). In the corresponding student tree diagram, multiple structural and representational errors are apparent. The most notable issue is the failure to group the coordinated verbs *write* and *share* under a single coordinated VP. Instead, they are represented as two separate VP branches, and the coordinating conjunction *and* is entirely omitted. This fragmentation violates standard phrase structure rules, which require coordinated infinitival verbs (e.g., *to write and share*) to be grouped hierarchically within the same VP. In addition, the infinitival marker *to* is incorrectly labeled as an adjective (Adj), indicating confusion over part-of-speech categories. While the NP *short stories* is present in the diagram, its syntactic connection to the verb *share* is unclear, and the inclusion of an incorrect PP label below *stories* introduces further ambiguity. These errors collectively indicate not only node misplacement and mislabeling but also a more fundamental difficulty in representing coordination and capturing the syntactic dependencies that occur within verb phrases.

Incorrect Word-Category Identification

Another recurring error identified in students' tree diagram constructions was the mislabeling of parts of speech (POS). This occurs when lexical items are assigned incorrect grammatical categories, such as labeling *run* as a noun or *school* as a verb. These errors closely mirror the findings of Marpaung et al. (2025), who reported that confusing noun phrases (NPs) with verb phrases (VPs) was among the most frequent

mistakes in EFL learners' syntactic analyses. Misclassification of this nature does not merely represent surface-level confusion; it also points to deeper semantic and syntactic gaps in learners' internalized grammatical knowledge. Without a clear understanding of word classes and their distributional properties, students are likely to propagate these mistakes throughout their diagram representations, distorting the intended hierarchical structure. The mistake that students do in this incorrect word-category identification presented on the picture below:

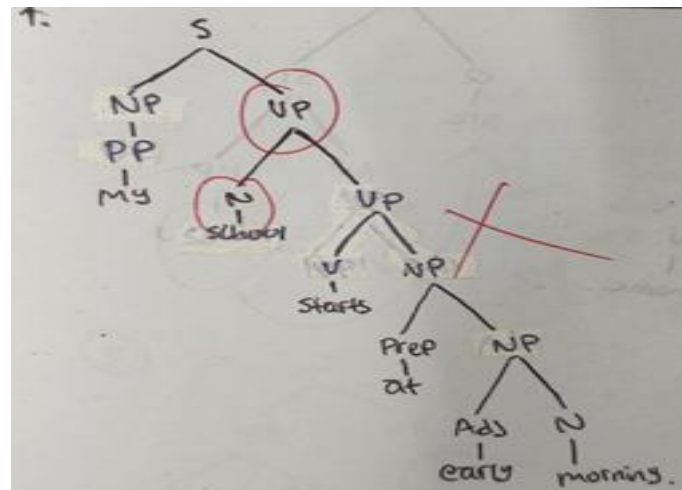


Figure 2. Incorrect Word-Category Identification

An illustrative example can be seen in the sentence *My school starts at early morning* (see Picture 2). In the corresponding student tree diagram, the phrase *early morning* is treated incorrectly as two separate elements rather than as a unified noun phrase functioning as the object of the preposition *at*. The diagram incorrectly splits the adjective *early* and the noun *morning* across different sub-branches, weakening the syntactic unity of the phrase and violating phrase-structure grouping principles. Additionally, the noun *school* is placed unusually under a VP node, which is structurally illogical given its role as the head noun within the subject NP. This misplacement is compounded by redundant VP labeling, suggesting a broader labeling confusion and a lack of clarity in identifying which elements function as verbs versus nouns.

Although the diagram attempts to represent the prepositional phrase *at early morning*, the segmentation and mislabeling result in an imbalanced visual structure with unnecessary branching. Such issues reflect a combination of mismanaged prepositional attachment, weak noun phrase cohesion, and inaccurate hierarchical positioning of constituents. These findings suggest that reinforcing foundational POS knowledge—particularly distinguishing between nouns, verbs, and modifiers—should be prioritized before students are expected to handle more complex syntactic representation tasks. Explicit instruction, combined with targeted practice in identifying word classes within various syntactic environments, can help address these recurring mislabeling patterns and improve accuracy in tree diagram construction.

Node Labeling Errors

A third frequent source of inaccuracy in student-generated tree diagrams involved node labeling errors, where the syntactic category or grammatical role assigned to a node did not align with its actual function in the sentence. In many cases, students misidentified syntactic heads or mislabeled functional elements, producing structures that were either unclear or misleading. As Marpaung et al. (2025) note, such errors diminish the analytical value of tree diagrams, as they obscure the hierarchical relationships that the diagrams are meant to clarify. These mistakes often arise when students rely on memorized templates without fully internalizing the principles of syntactic theory, leading to labeling decisions that are mechanically applied but theoretically unsound.

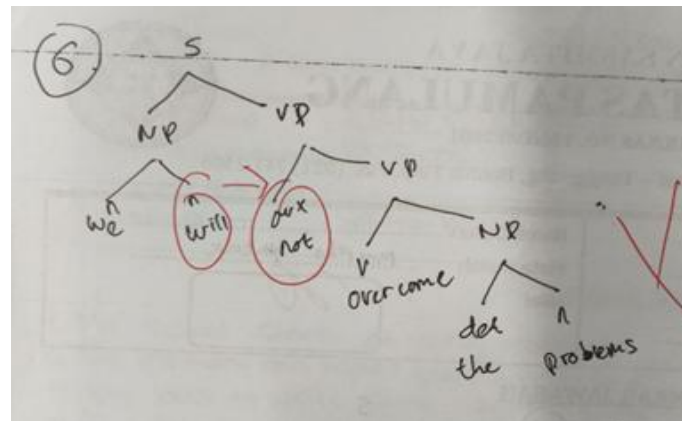


Figure 3. Node Labeling Errors

An illustrative example appears in the sentence *We will overcome the problems* (see Picture 3). In the corresponding student tree diagram, the auxiliary *will* and the main verb *overcome* are both labeled as if they were independent main verbs, each placed under separate VP nodes. This representation suggests that the student has interpreted *will* as a lexical verb rather than a functional auxiliary, resulting in a misrepresentation of the verbal phrase. In proper syntactic analysis, *will* functions as an auxiliary (Aux) that supports the main verb *overcome*, and both elements should appear together under a single VP node. The separation of these elements into two distinct VP branches not only disrupts the hierarchical representation but also misrepresents the grammatical relationship between them.

Compounding the problem, the diagram redundantly labels *will* as both an auxiliary (Aux) and a main verb (V), creating inconsistency within the structure. Such dual labelling violates phrase structure conventions and can cause confusion about the functional role of auxiliaries in English syntax. Errors of this kind reveal a broader difficulty in analyzing verb chains, particularly when auxiliary verbs are involved—a challenge also documented in the studies of Marpaung et al. (2025) and Faraj (2023). Since auxiliary verbs play a crucial role in expressing tense, aspect, and modality, misunderstanding their syntactic integration can have cascading effects on the accuracy of sentence analysis. Addressing this issue requires explicit instruction on auxiliary–main verb relationships, supported by exercises that require learners to identify and correctly label functional.

Phrase-Structure Violations

A fourth common error observed in student-generated tree diagrams involves phrase-structure violations, particularly at prepositional phrase (PP) or clause boundaries. Students often struggle to apply syntactic rules consistently, leading to incorrect attachment of PPs or fragmentation of complex phrases. As noted by Uspayanti (2024) and Faraj (2023), these errors stem from confusion over hierarchical structures and rule-based constructions, especially regarding syntactic subordination. The sentence she loves to write short stories showing the error in the tree diagram below:

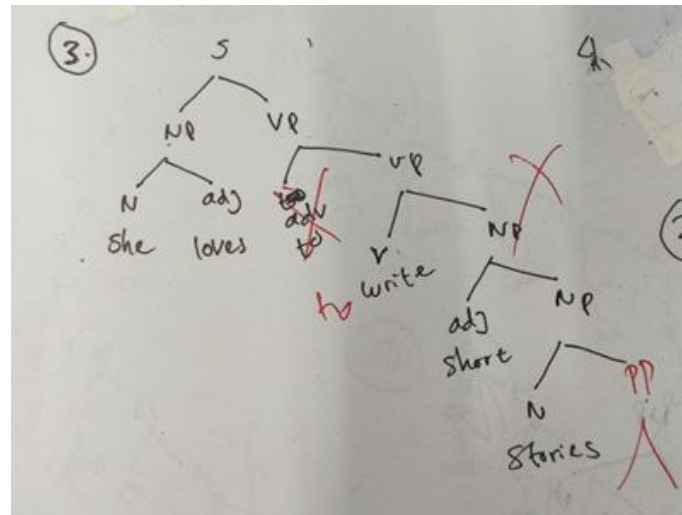


Figure 4. Phrase-Structure Violations

An example is found in the sentence *She loves to write short stories in the coffee shop* (see Picture 4). In the student's tree diagram, the PP *in the coffee shop* is incorrectly attached, without proper regard for clause or phrase boundaries. Instead of functioning clearly as a modifier of the verb phrase *to write short stories* or being integrated at the appropriate clause level, the PP is either separated ambiguously or misplaced within the structure. This misplacement reveals that the student has not fully considered the semantic scope or hierarchical position of modifiers. Proper syntactic analysis requires PPs to be positioned according to whether they modify the verb *write*, the object *stories*, or the entire VP. The student's failure to distinguish these functional boundaries results in an inaccurate and misleading representation.

Moreover, there is a tendency for students to flatten hierarchical structures or neglect the recursive embedding of PPs within noun phrases (NPs) or verb phrases (VPs). These phrase-structure violations reduce the clarity and precision of syntactic trees, as they obscure the intended syntactic relations. Addressing this issue requires explicit teaching to help students recognize phrase boundaries and apply consistent structural representations. Such instruction can improve learners' ability to handle complex sentences involving embedded phrases, enhancing both their syntactic understanding and analytical accuracy.

Hierarchical Misinterpretations

Another common and challenging error in student-generated tree diagrams involves the misrepresentation of hierarchical relationships, particularly in passive constructions that require auxiliary movement and agent demotion. Students frequently struggle to correctly represent these structures, reflecting confusion about how abstract grammatical functions such as subject and agent are structurally encoded.

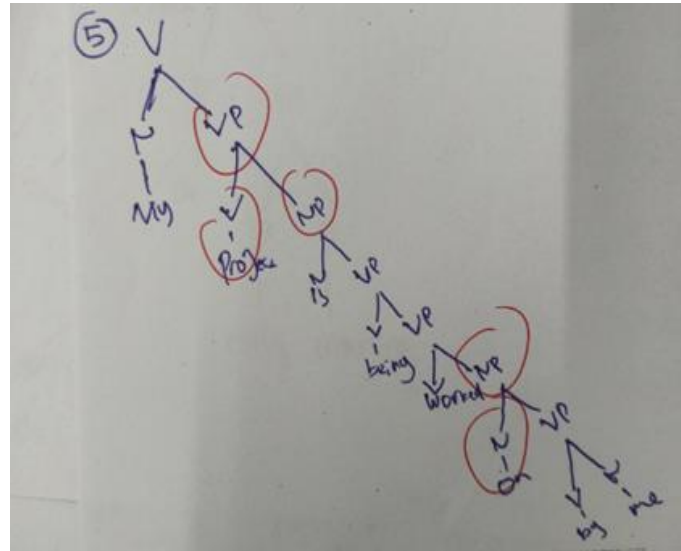


Figure 5. Hierarchical Misinterpretations

An illustrative example appears in the sentence *My project is being worked on by me* (see Picture 5). In the student's tree diagram, the agent phrase *by me* is misplaced in a VP position rather than attached as an adjunct PP to the verb phrase. Standard syntactic analysis treats the agent as an optional PP introduced by *by* and attached at the appropriate level within the VP, reflecting its peripheral role. Additionally, the verb phrase *is being worked on* is broken down into excessively flat or duplicated VP nodes. This segmentation disrupts the hierarchical layering of the auxiliary verbs *is* and *being* with the passive participle *worked*, which should be nested together under a single VP node to capture their syntactic dependency. These misrepresentations reveal a broader difficulty among learners in visualizing verb chains and understanding the syntactic status of optional constituents such as passive agents. The flawed tree structure demonstrates limited understanding of how passive voice modifies argument structure and the syntactic demotion involved. Addressing these hierarchical errors requires explicit instruction on passive constructions and hierarchical verb phrase organization. This error also described in another kind of sentence, interrogative sentence, as well like in the picture:

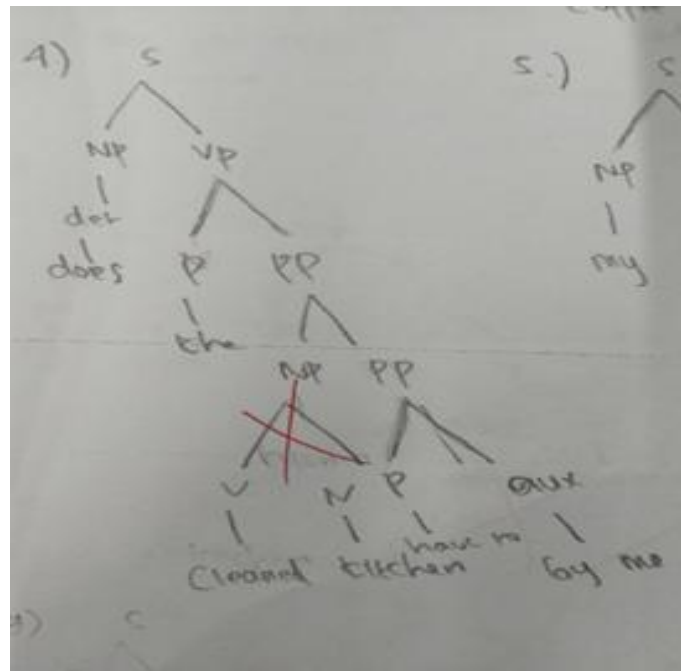


Figure 6. Hierarchical Misinterpretations (interrogative sentence)

Auxiliary *does* and modal constructions are misplaced; interrogative structure is not visualized correctly. In the syntactic tree for the sentence *Does the kitchen have to be cleaned by me?*, the diagram shows critical errors in representing the interrogative structure and modal auxiliary sequence. Most notably, the auxiliary *does*, which signals the interrogative mood, is misclassified as part of the NP and incorrectly integrated at the top of the tree, instead of being placed under a Tense or Aux node within the inflectional phrase (IP/TP) structure. Similarly, the modal sequence *have to be cleaned* is broken down in a way that flattens its hierarchical dependencies. The main verb *cleaned*, being a passive participle, should appear at the core of the VP, with *have to be* layered above it in nested auxiliary projections. Furthermore, *by me*, which introduces the agent in this passive construction, is not clearly marked as a PP adjunct and appears structurally tangled within the VP. These structural inaccuracies lead to an incomplete representation of how interrogative auxiliaries invert and how modal verbs interact in a passive context. Passive and interrogative constructions are especially prone to syntactic misanalysis among learners due to their non-canonical word order. The diagram ultimately fails to show the subject-auxiliary inversion characteristic of questions and does not capture the layered VP structure required for accurate analysis of complex verb phrases.

Conclusion

The results of this study revealed that English language students make a range of errors when constructing and interpreting syntactic tree diagrams. These errors were classified into five main categories: hierarchical misplacement, grammatical mislabeling, incorrect phrase segmentation, visual representation issues, and task completion problems. Among the most common were errors related to constituent placement, such as splitting verb phrases or mis grouping coordinated structures and misunderstandings in labeling word categories like auxiliaries and main verbs. Passive and interrogative sentences

were particularly prone to misanalysis, especially when auxiliary verbs or agent phrases were involved. These findings confirm that students often struggle not only with diagramming mechanics but also with applying consistent syntactic principles. Furthermore, the nature and pattern of these errors reflect a partial or surface-level understanding of syntactic structure and constituent relationships. Many students demonstrated difficulty in visualizing abstract grammatical relations, which led to structural imbalances and misinterpretation of phrase boundaries. The inability to properly coordinate elements, nest verb sequences, or distinguish between core and adjunct constituents suggests that students have not yet internalized the hierarchical and functional logic of syntax. This highlights the need for instruction that not only introduces syntactic theory but also actively bridges it with practical skills enabling students to apply structural rules meaningfully and accurately in their tree diagram constructions.

From a theoretical perspective, future researchers are encouraged to explore deeper cognitive and linguistic factors that influence students' ability to construct syntactic tree diagrams. Investigating the role of metalinguistic awareness, working memory, or prior exposure to formal grammar instruction may provide more comprehensive explanations for recurring errors. Moreover, researchers could examine how different syntactic theories (e.g., Minimalist Program vs. X-bar theory) affect students' interpretation and diagramming of sentence structures. Comparative studies across educational levels or L1 backgrounds. Practically, future research could focus on developing and evaluating instructional interventions aimed at reducing diagramming errors. These may include visual scaffolding techniques, gamified syntax exercises, or digital tools that provide real-time feedback on tree construction. Longitudinal studies could also assess whether consistent practice with structured feedback significantly improves students' syntactic accuracy over time. Furthermore, classroom-based research that integrates students' reflections on their errors may help educators tailor syntax instruction more effectively, bridging the gap between rule-based theory and diagrammatic application.

Acknowledgments

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