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Revolutionizing English Language Learning: Reducing Misconceptions with Student-Centered Learning and Syntax Trees

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Abstract
Prospective educators majoring in English Language Education need competence in various linguistic aspects, including phrase structure. Many students struggle with this due to traditional teaching methods that limit creativity and lead to misconceptions. To address this, a Student - Centered Learning (SCL) approach and the assisted Syntax Tree application were introduced in classes E and F. The study used a One-Group Pretest-posttest Design and SPSS software for data analysis. Results show that the SCL approach with the Syntax Tree application significantly reduces misconceptions about English phrase recognition and improves student engagement and learning outcomes.

Keywords: Reducing misconception, Student - Centered Learning, Syntax tree
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1. Introduction

Misconceptions often arise in learning English syntax, especially in the introduction of phrases. The students of English education study program often have difficulty recognizing phrases in English. Indeed, this knowledge is crucial for students to understand the subsequent materials in the English syntax course and to produce academic writing as their mandatory assignment in completing their studies. The recommendation to address issues and reduce misconceptions in English syntax learning is to implement Student-Centered Learning (SCL). Student-Centered Learning (SCL) is distinct from Teacher-Centered Learning (TCL). TCL focuses on one-way knowledge transfer from the teacher to passive students, whereas SCL is a mindset and educational approach in higher education that aligns with constructivist learning theories. In SCL, students actively participate in shaping the learning process, with the teacher serving as a facilitator who provides information and adjusts as needed. SCL promotes knowledge acquisition over rote memorization and encourages the development of higher-order thinking skills (Abdigapbarova & Zhiyenbayeva, 2023). The SCL prioritizes students' involvement, initiative, and social interaction (Jacobsen et al., 2009), shifting the focus from the teacher's preferences to the students' needs and styles (Sanjaya, 2011). In SCL, the teacher's role transforms from being a primary source of knowledge to that of a facilitator, guiding and assisting students in their learning journey, fostering a more collaborative and adaptive approach to education (Sanjaya, 2011).Therefore, it is necessary to make changes to the method used in teaching phrase recognition. There are various teaching methods that can be used instead of the lecture method. Student-centered learning (SCL) is one of the most popular and promising instruction approaches that enhances the active role of students in their education (Guillermo & Humberto, 2019). SCL is a learner-centered education that focuses on creating and implementing active roles of the learners by placing them at the heart of learning (Soubra et al., 2022). It encourages students to deeply engage with the material, develop a dialogue and collaboration, critically think (Adiko, 2022), and reflect on their progress (Soubra et al., 2022). There are other teaching methods under the SCL approach that have been found to be effective (Ahmed, 2017; I. P. Shah, 2019; Soubra et al., 2022). SCL emphasizes active student involvement (Tholibon et al., 2022; Нурбергеновна Мамирова, 2021), creativity, innovation (Tholibon et al., 2022; Winarsih, 2017), and taking responsibility for the learning process(Gabriel et al., 2015; Нурбергеновна Мамирова, 2021).

According to Siswono and Karsen in (Rochmat et al., 2022), the Student-Centered Learning (SCL) model has several characteristics that align with the aforementioned characteristics. The features are: teachers support and guide students in material development; open-minded teachers value student input and criticism; flexible teaching adapts to students' needs; students lead, deciding what and how to learn; students actively contribute ideas and feedback (Warner, 2015); encouragement of independent material creation; student expresses expectations and self-assess; Fostering collaboration among students; self-monitoring and strategy development encouraged; motivating self-determined goals for students (Lyles & Oli, 2020); student autonomy in team selection; learning materials provide guidelines for creativity; learning as an active knowledge-seeking process (Hamlin, 2018; Ramirez, 2017; Wulf, 2019).

Student-Centered Learning (SCL) can enhance motivation, knowledge retention, understanding, and attitudes toward subjects (Fuehne, 2007; Khumaidi, 2018; Kulakow & Raufelder, 2020; Lampropoulos, 2023; Lyles & Oli, 2020; Sani, 2020; A. Shah et al., 2020; Twichell, 2020; Warner, 2015; Wijayanto, 2016). Both lecturers and students must actively participate for SCL to be effective Marhaeni (2008). Lecturers facilitate learning, assess student competencies, design diverse learning experiences, assist with information processing, and determine assessment methods. Students evaluate competencies, review learning strategies, create subject-specific plans, and engage actively in various learning activities (A. Shah et al., 2020; Twichell, 2020), including analysis, synthesis, and evaluation. The benefits of implementing SCL can be maximized by introducing an assisted syntax tree application to improve students' English phrase recognition ability.

The Syntax Tree application is a useful tool for students, aiding them in analyzing phrases and improving their language skills. It helps them grasp sentence structure, word relationships, and elements like subjects, verbs, and objects (Radford, 2009; Qureshi et al., 2021). Moreover, it has applications in coding by treating code as visual images, preserving context and structure for analysis (Shi et al., 2023). Syntax trees are visual aids for analyzing English phrases. They show a sentence's structure by representing its constituents as nodes in a hierarchical format, illustrating their connections and helping identify the grammatical structure of the sentence (Williams, 2019). Linguists use syntax trees to analyze sentence structure, identifying phrases and clauses and their relationships. This helps uncover grammar rules and aids in language processing and generation model development (Williams, 2019). Overall, the goal is to decrease misconceptions related to teaching English phrase recognition in English syntax learning.

Misconceptions and errors differ in nature. Errors result from improper and haphazard problem-solving strategies, leading to incorrect answers. In contrast, misconceptions arise from underlying cognitive structures that ultimately result in errors (Murni, 2013). There are several general causes of misconceptions in learning (Liliawati & Ramlan Ramalis, 2009): misconceptions from the perspective of constructivism philosophy (Muhibbuddin et al., 2018), students (Khalid, 2018; Sumardi et al., 2020) lecturers/teachers (Sbaragli & Santi, 2011), textbooks, context (Muhibbuddin et al., 2018), teaching methods (Sumardi et al., 2020). Educators should prioritize understanding these potential origins of misunderstandings and proactively work to tackle them in their teaching methods.

The focus of this research is on investigating the impact of implementing SCL (Student-Centered Learning) with the assistance of a syntax tree application on reducing the level of misconceptions and enhancing the engagement of English language students in the learning of phrase recognition.

2. Methodology

2.1 Research Type and Design

This experimental study focused on improving English Language Education students' phrase recognition ability using the SCL approach and the syntax tree application. It included two classes (Class E and Class F), each divided into five groups of five students. The study provided specific treatments to reduce misconceptions and enhance engagement in learning. The research utilized a one-group pretest-posttest design, focusing on an experimental class. This class was evaluated with a pretest before treatment and a posttest after treatment to assess a reduction in misconceptions. The main objective was to compare student learning outcomes before and after implementing the SCL approach with the assistance of the syntax tree application, following Sugiyono (2016) model.

This study examined student engagement through peer lecturer-compiled observation sheets. These sheets assessed student participation, with a focus on recognizing phrases, and were used by peer lecturers to document and assessed student engagement during teaching and learning sessions.

2.2 Data Collection Technique

This study was conducted at Tadulako University's English Language Education Study Program, involving all students from the 2021 cohort in Classes E and F as both the population and sample (total sampling). The research relied on primary data collected through classroom experiments, focusing on two types of data: student learning outcomes and student engagement. Learning outcomes were assessed through tests to measure the reduction of misconceptions in phrase recognition learning before and after six treatment sessions. Student engagement data was gathered through observation sheets, tracking scores based on various answer choices.

Student learning outcomes were evaluated based on the criteria provided in the Misconception Reduction Grade Conversion Table.

Table 1. Misconception Reduction Grade Conversion

UNDERSTANDING		MISCONCEPTIONS	
Score	Mastery Level	Error Percentage Range	Misconception Level
90 – 100	Very High	≤ 15	Very Low
80 – 89	High	16 – 25	Low
70 – 79	Medium	26 – 35	Medium
60 – 69	Low	36 – 49	High
0 – 59	Very Low	≥50	Very High

Adapted from Unimed Guidelines, 2019-2020 (Unimed, 2020)

A strong grasp of phrase recognition leads to fewer misconceptions in phrase recognition learning. Student engagement assessed using an observation sheet, and the scores were grouped into different frequency categories. The top category signifies actively engaged students.

Table 2. Student Engagement Score and Category

GRADE		SCORE	ENGAGEMENT CATEGORY
LETTER	NUMBER		
A	3	85 – 100	Very Active
B	2	70 – 84	Active
C	1	60 – 69	Less Active
D	0	0 – 59	Very Inactive

Adapted from Unimed Guidelines, 2019-2020 (Unimed, 2020)

Table 3. Student Engagement Observation Sheet

Observation Sheet of Student Activity

Meeting Number : _____
Student Name : _____
Student ID : _____

No	Observed Activity Type	Score			
		0	1	2	3
1	Asking questions to the lecturer				
2	Answering lecturer's questions				
3	Asking questions to classmates				
4	Answering classmates' questions				
5	Contributing opinions in the learning process				
6	Working on assignments with group members				
7	Taking notes of information obtained during the learning process				
8	Actively listening to information from lecturers and other students				

Note: 3 = Very active; 2 = Active; 1 = Less active; 0 = Not active at all

2.3 Data Analysis Technique

Data analysis in this research utilized SPSS version 20.0 and consisted of two stages:

2.3.1 Descriptive statistical analysis

In describing data, the mean of each class's learning outcomes illustrated the data characteristics. The mean values of each class were derived from the pretest and posttest scores. Visualization of data characteristics was done using histograms. The same descriptive analysis performed for student engagement scores.

2.3.2 Paired-sample t-test

The paired-sample t-test is employed to analyze data with dependent samples, where there is a connection between paired values. In this research, the test was applied to students both before and after a treatment to calculate a t-value. This t-value was then compared to a reference value from a t-table to assess whether utilizing the SCL approach with the Syntax Tree application reduced misconceptions in phrase recognition learning.

3. Findings and Discussion

The summary table presents research data on learning outcomes and student engagement, specifically focusing on English phrase recognition. It assumes that higher levels of understanding lead to fewer misconceptions.

3.1 Learning Outcomes

Table 4. Students Learning Outcomes

Kelas	Parameter	Pretest Score	Postest Score	Total
E	N	33	33	66
	$\overline{X}$	72.36	79.79	
	Me	85	83	
	S^2	431.68	57.92	
	S	20.78	7.61	
	Min	20	60	
	Max	89	89	
F	N	32	32	64
	$\overline{X}$	69.09	78.94	
	Me	70	80	
	S^2	250.14	33.22	
	S	15.82	5.76	
	Min	40	67	
	Max	87	87	

Table 4 presents pretest and posttest scores for students in classes E and F who underwent the SCL approach for learning English phrase recognition. Overall, this approach led to a decrease in student misconceptions, as evidenced by an increase in their phrase recognition understanding. In class E, the average score rose from 72.36 to 79.79, representing a 7.43-point increase. Class F saw an even greater improvement, with scores increasing from 69.09 to 78.94, marking a 9.04-point rise.

Figure 1. Test Score of Class E

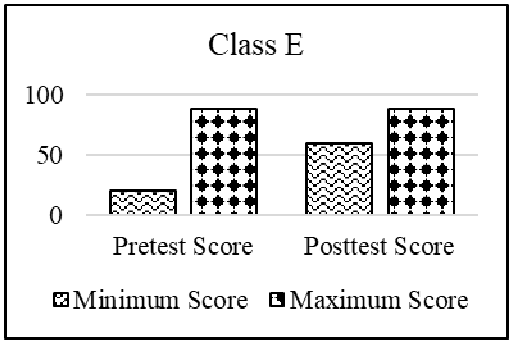

Figure 1 presents significant differences between pretest and posttest results. The pretest had a 69-point range, while the posttest reduced it to 20 points. This reduction signifies the effectiveness of the SCL approach and syntax tree application in decreasing student misconceptions in English phrase recognition in class E, indicating improved understanding of the topic.

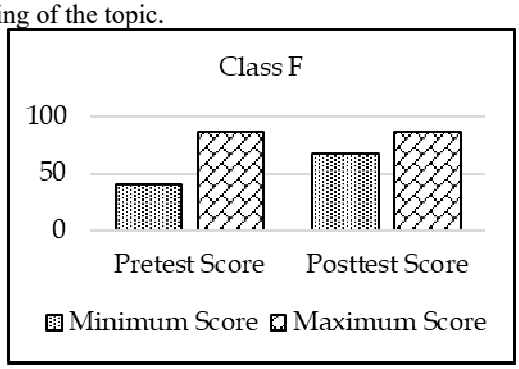

Figure 2. Test Score of Class F

The gap between the lowest and highest scores in both the pretest and posttest of class F is smaller compared to class E, with a 47-point difference in the pretest and 20-point difference in the posttest. Despite this, figure 2 indicates that the number of student misconceptions in class F has reduced, and their grasp of phrases has improved following the intervention.

Table 5. Frequency Distribution of Pretest Scores for Class E

Standard Interval	Class Interval	Midpoint	Frequency	Cumulative Frequency	Relative Frequency (%)
85 – 100	84.5 – 100.5	92.5	18	18	54.5
75 – 84	74.5 – 84.5	79.5	1	19	3.0
65 – 74	64.5 – 74.5	69.5	6	25	18.2
59 – 64	58.5 – 64.5	61.5	2	27	6.1
0 – 58	0 – 58.5	29.0	6	33	18.2
Total			33		100.0

Table 6. Frequency Distribution of Posttest Scores for Class E

Standard Interval	Class Interval	Midpoint	Frequency	Cumulative Frequency	Relative Frequency (%)
85 – 100	84.5 – 100.5	92.5	15	15	45.5
75 – 84	74.5 – 84.5	79.5	11	26	33.3
65 – 74	64.5 – 74.5	69.5	6	32	18.2
59 – 64	58.5 – 64.5	61.5	1	33	3.0
0 – 58	0 – 58.5	29.0	0	33	0.0
Total			33		100.0

The tables (table 5 & table 6) display the pretest and posttest scores distribution for Class E. The data indicates an improvement in students' comprehension and a decrease in misconceptions about English phrases. There was a drop in the number of students scoring 85-100 points (from 54.5% to 45.5%) but an increase in the 75-84 range by 30.3%. The SCL approach appears effective as there are no students in the lowest comprehension range (0-58) in the posttest compared to 6 in the pretest. The 65-74 range had a consistent number of students, accounting for 18.2% in both tests.

Table 7. Frequency Distribution of Pretest Scores for Class F

Standard Interval	Class Interval	Midpoint	Frequency	Cumulative Frequency	Relative Frequency (%)
85 – 100	84.5 – 100.5	92.5	8	8	25.0
75 – 84	74.5 – 84.5	79.5	7	15	21.9
65 – 74	64.5 – 74.5	69.5	9	24	28.1
59 – 64	58.5 – 64.5	61.5	1	25	3.1
0 – 58	0 – 58.5	29.0	7	32	21.9
Total			32		100.0

Table 8. Frequency Distribution of Posttest Scores for Class F

Standard Interval	Class Interval	Midpoint	Frequency	Cumulative Frequency	Relative Frequency (%)
85 – 100	84.5 – 100.5	92.5	8	8	25.0
75 – 84	74.5 – 84.5	79.5	18	26	56.2
65 – 74	64.5 – 74.5	69.5	6	32	18.8
59 – 64	58.5 – 64.5	61.5	0	32	0.0
0 – 58	0 – 58.5	29.0	0	32	0.0
Total			32		100.0

In Class F, there was an improvement in the average level of student understanding of English phrase recognition, as indicated by the pretest and posttest score distribution in tables 7 and 8. Notably, in the second-class interval, the percentage of students scoring highly increased significantly, from 21.9% in the pretest to 56.2% in the posttest. No students scored in the fourth and fifth class intervals, while the highest understanding level remained stable. However, there was a slight decrease in the 65-74 class interval, with the number of students dropping from 9 to 6.

Tabel 9. SPSS Calculation Results for Paired Sample Test for Class E (Paired Samples Test)

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pretest – Postest	-7.42424	17.20107	2.99432	-13.52348	-1.32501	-2.479	32	.019

Tabel 10. SPSS Calculation Results for Paired Sample Test for Class F (Paired Samples Test)

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pretest – Posttest	-9.84375	13.82461	2.44387	-14.82805	-4.85945	-4.028	31	.000

The paired t-test results for class E and class F show significant improvements in posttest scores compared to pretest scores. The significance values are 0.019 for class E (table 9) and 0.000 for class F (table 10), both smaller than the critical value (α=0.05). This suggests that the Student-Centered Learning (SCL) approach, aided by the syntax tree application, effectively enhances English phrase recognition in students of the English Language Education Study Program.

3.2 Student Engagement

Student engagement analysis was done using observation sheets containing eight statements that measure students' engagement levels. Responses were categorized as "Least Active" (0), "Less Active" (1), "Active" (2), and "Very Active" (3). The average value of the observation results is shown in a bar chart.

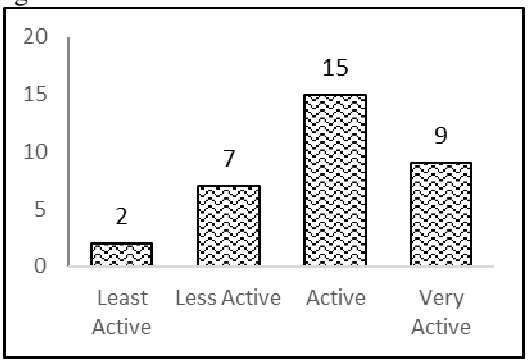

Figure 3. Student Engagement in Class E

Figure 3 illustrates the level of student engagement in phrase recognition learning with the implementation of SCL (Student-Centered Learning) aided by syntax tree application. In general, the number of active students is much higher compared to inactive students. During the course learning process, 24 students were categorized as actively participating by asking questions, answering questions, expressing opinions, taking notes, and listening to information from the lecturer as well as their classmates. In contrast, 9 students were classified as inactive in the learning activities.

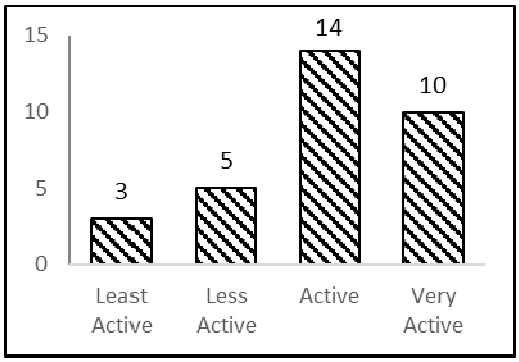

Figure 4. Student Engagement in Class F

The level of student engagement in class F during phrase recognition learning through SCL and syntax tree application is indicated by Figure 4. Generally, the number of active students exceeds the number of inactive ones. There are a total of 24 students, divided into 14 who are active and 10 who are very active participated in the learning process. Meanwhile, 5 students are classified as less active, and 3 students have the least active level of engagement.

Based on the data description, the discussion in this research is grouped into two aspects related to the research purposes, namely: (1) Implementation of the Student- Centered Learning (SCL) approach assisted by the syntax tree application, and (2) The impact of implementing Student Centered Learning (SCL) assisted by the syntax tree application on students' level of activeness. The implementation of the Student-Centered Learning (SCL) approach discussed here refers to the study of the improvement of students' learning outcomes after applying the SCL approach in English phrase recognition learning. The syntax tree application is used as a tool in group learning to help students recognized phrases easily. The impact of implementing Student Centered Learning (SCL) on the level of students' engagement is indicated by the positive changes in students' activeness during the learning process when SCL is used, as well as during group learning using the syntax tree application.

1. Implementation of Student-Centered Learning (SCL) Approach

The Student-Centered Learning (SCL) approach commonly used in education is an approach that places the students or learners at the center of the learning and teaching activities, thereby developing their interest, motivation, and individual abilities to be more active, creative, innovative, and responsible for their own learning process. In this study, the implementation of SCL (Student-Centered Learning) makes students more actively engaged in the teaching and learning process. They genuinely strived to understand the material that was discussed within their groups because the lecturer only played a facilitator role. The English Phrase material, which was previously very challenging for students when taught using TCL (Teacher-Centered Learning), showed highly significant results in this research. This aligns with information conveyed by several previous researchers (Fuehne, 2007; Khumaidi, 2018; Kulakow & Raufelder, 2020; Lampropoulos, 2023; Lyles & Oli, 2020; Sani, 2020; A. Shah et al., 2020; Twichell, 2020; Warner, 2015; Wijayanto, 2016). SCL approach provides autonomy, better management of learning materials, and activities for students, allowing them to have input in their learning, such as choosing the materials, methods, and learning time. By applying the SCL approach in education, it is expected to develop the qualities of human resources required by society, such as activeness, creativity, leadership, self-confidence, independence, discipline, critical thinking, communication skills, teamwork, technical skills, and global awareness to adapt to changes and developments.

Student Centered Learning (SCL) is an approach that focuses on the students or learners, making the role of the lecturer as a facilitator in the learning process. In the SCL approach, learners have full responsibility for their learning activities, especially through active involvement and participation. The relationships among students are equal, reflected in their collaboration within groups to accomplish learning tasks. The teacher plays a role as a facilitator to encourage students' development and is not the sole source of learning. Implementing Student-Centered Learning (SCL) in an English syntax course has had a significant positive impact, especially in the introduction of phrases. Students' learning outcomes improved noticeably, even when tested after all course treatments. This suggests that information taught using SCL and syntax trees is retained in their long-term memory ((Gargrish et al., 2022; Kusuma & Retnowati, 2021; Siagian et al., 2023; Tesi Muskania & Supena, 2021; Безкоровайна & Дищаковська, 2020).

Based on the analysis of the frequency distribution of pretest and posttest scores of students from classes E and F, which are the samples in this research, a significant improvement in cognitive ability or learning outcomes was obtained. This improvement in learning outcomes is marked by an increasing understanding of the taught material by the students. After converting this understanding score into a misconception level using a success indicator table, the results indicate a decrease in students' misconceptions in English phrase recognition after applying SCL in the learning process. This means a reduction in their misunderstandings specifically

related to English phrases. This aligns with the general definition of misconceptions presented by Tayubi (2005). In another research titled "The Effectiveness of Implementing the Predict Observe Explain (POE) Model on Students' Argumentation Skills in Acid-Base Material" (Fransiska, 2023), the results showed that using the POE model, which is a derivative of the SCL approach, could decrease students' misconceptions and improve their understanding, enabling them to argue effectively in the focused material.

The improvement in academic ability to recognize English phrases by implementing the SCL approach is closely related to one of the teaching characteristics using the SCL approach presented by (Jacobsen et al., 2009), which emphasizes a deep understanding of the content and processes involved. This emphasis has proven successful in raising the test scores of students in classes E and F by 7.43 points and 9.04 points, respectively. These scores are the results of the difference between the posttest and pretest scores. A study conducted by Ayuningtiyas et al. (2021) also showed an improvement in cognitive abilities among the selected samples, as well as improvements in other aspects focused on in the research.

Escalation of learning outcomes for students in classes E and F in this research is a logical consequence of optimizing the use of the syntax tree application. The Syntax Tree application is used to draw tree diagrams. This tree diagram is a way to present lexical elements in a sentence and describe the syntactic structure of phrases or sentences (Radford, 2009). Through the SCL approach in learning about phrase recognition, students become more active and enthusiastic. Students are divided into groups and given the freedom to investigate and study the materials about phrases in English. However, if only this approach is applied, it may still be less effective, so media that can support successful learning, such as the syntax tree application, are needed (Idris et al., 2021).

In addition to the application, the role of the Learning Media Worksheet (LKM) also has a positive influence on increasing students' cognitive abilities and activeness. The LKM used in English phrase recognition learning helps students build their understanding of the subject matter being studied. A good LKM can guide students to discover the concepts on their own (Ardina, 2016). In line with this research, Ulfah et al. (2018) also proved in their study that in group learning, student worksheets play a significant role in increasing students' curiosity and academic achievement in the material being studied. This is because the worksheets present a variety of numerous questions.

2. The Impact of Implementing SCL assisted by the Syntax Tree Application on the level of students Engagement

Lecturers tended to use the Teacher Centered Learning (TCL) approach before the implementation of the SCL approach. This was characterized by teaching that was more focused on the teacher, while students tended to be passive. The characteristics of TCL learning in classes E and F in English phrase recognition were as follows: Explaining the material in the textbook, giving opportunities for students to ask questions, and giving assignments to students.

After implementing the SCL approach assisted by the syntax tree application, students showed their ability to collaborate with all the elements that support the learning process, whether it be collaborating with classmates, technology, or teachers (Adiko, 2022). Learning through various different activities compared to when TCL was applied. In several instances, students displayed an interesting atmosphere during their learning activities, where they became active participants who contributed ideas, suggestions, and critiques (Karsen, Marini, 2008). The roles and responsibilities of both teachers and students in the learning process changed drastically, as presented by Adiko (2022): acting as a facilitator in the learning process, examining the subject competencies that students must master at the end of the learning process, designing learning strategies and environments that provide diverse learning experiences, helping students access information, organize, and process it for use in solving everyday life problems, identifying and determining assessment patterns of students' learning outcomes that are relevant to the measured competencies. Examining the competencies conveyed by the teacher, examining the learning strategies offered by the teacher, creating a learning plan for the subject they are studying, actively learning both in groups and individually (by listening, reading, writing, discussing, problem-solving, and engaging in higher-order thinking activities such as analysis, synthesis, and evaluation).

With the implementation of SCL, the increase in students' activeness is evident. The lecturer's activities are dominated by managing the learning process according to the research design, encouraging or training students' active independence. Additionally, students' activities are dominated by independent tasks and relevant group discussions, as well as practicing process skills. The level of active independence increases along with the percentage of lecturer activities that train these skills for students. The dominant active independence practiced by students includes asking and answering questions, giving opinions, listening and taking notes, and sharing tasks within groups to complete group assignments.

The students' ability in discussions and tests also improved, as indicated by the comparison of pretest and posttest results for students in classes E and F (table 4) and the observations of students' engagement in the activities. This ability can also be seen in students' ability to complete group assignments. Initially, students did not engage in active learning and discussions, but after the activities, they gained experience participating in the learning process.

CONCLUSION

The finding of this study of the research on the implementation of student-centered learning with the support of the syntax tree application to enhance academic abilities and student engagement in English phrase recognition, the following conclusions can be drawn: First, the student-centered learning approach in English phrase recognition has been successfully applied, leading to improved learning outcomes and a significant reduction in student misconceptions. Before the implementation of student-centered learning, students commonly misunderstood several English phrases. However, after the application of this approach, students' academic abilities improved drastically, as evidenced by a notable difference between the pretest and posttest results of the research sample. Second, the implementation of student-centered learning also had a positive impact on students' level of engagement in the process of learning English phrase recognition. Student-centered learning has the potential to encourage students to learn actively, independently, and according to their individual learning rhythms, in line with the current information and technology developments. SCL is a learner-centered approach where students actively and responsibly engage in the learning process. Students' activities are dominated by relevant independent tasks and discussions, as well as practicing the required learning skills. Third, the improvement in learning outcomes and student engagement in English phrase recognition is a result of implementing student-centered learning, facilitated by the use of the Syntax Tree application. Students use this application individually or in groups to complete exercises written in the Student Worksheets. The learning objectives of SCL are integrated into the Student Worksheets to achieve the planned enhancement of students' cognitive abilities and engagement, leading to a reduction in student misconceptions regarding English phrase recognition.

After presenting the process and findings of this research, the following recommendations are suggested by the research team: First, the student-centered learning approach with the support of the syntax tree application is an alternative teaching method that fosters active, independent, and socially interactive attitudes among students. Therefore, it is recommended to implement this approach in teaching other English Syntax topics. Then, adequate technological facilities should be provided by educational institutions to enable all students to actively participate in computer-supported learning, which is crucial for effectively implementing the student-centered learning approach without hindrance. Finally, before implementing student-centered learning, instructors should prepare Student Worksheets that align with this approach. This will hopefully spark students' interest and enthusiasm for learning, leading to better learning outcomes in each class meeting.

References

Abdigapbarova, U., & Zhiyenbayeva, N. (2023). Organization of Student-Centered learning within the Professional Training of a future teacher in a Digital Environment. *Education and Information Technologies*, *28*(1), 647–661. https://doi.org/10.1007/s10639-022-11159-5

Adiko, R. G. (2022). Analisis Penerapan Model Pembelajaran Student Centered Learning Dengan Media Daring Pada Mata Kuliah Auditing (Studi Kasus Pada Mahasiswa Akuntansi Universitas Potensi Utama. *Accumulated Journal (Accounting and Management Research Edition)*, *4*(1), 2722–5399.

Ahmed, S. M. (2017). Comparison of Traditional lectures vs. Problem based learning in Microbiology among Undergraduate students. *Indian J Microbiol*, *4*(2), 159–161. https://doi.org/10.18231/2394-5478.2017.0033

Ardina, F. R. (2016). Lembar Kerja Siswa Berbantuan Geogebra Sebagai Upaya Membantu Pemahaman Siswa Materi Limit Fungsi Aljabar. *Jurnal Math Educator Nusantara*, *02*(01), 1–10.

Ayuningtiyas, G. W., Printina, B. I., & Subakti, Y. R. (2021). Implementasi Collaborative Learning Dalam Pembelajaran Sejarah Di SMA Kolese De Britto. *Historia Vitae*, *01*(02), 69–83.

Fransiska, N. (2023). *Efektivitas Penerapan Model Predict Observe Explain (POE) Terhadap Kemampuan Argumentasi Siswa Pada Materi Asam Basa*. Program Studi Pendidikan Kimia, Jurusan Pendidikan Matematikan dan Ilmu Pengetahuan Alam, Fakultas Keguruan dan Ilmu Pendidikan.

Fuehne, J. P. (2007). Experience with Active Learning, Frequent Assessment and Student Evaluations. *Proceedings of the Spring 2007 American Society for Engineering Education Illinois-Indiana Section Conference*.

Gabriel, F., Ugon, J., & Larkins, J. (2015). Implementing student centred learning in a traditional tertiary environment. *ACSME Proceedings| Transforming Practice: Inspiring Innovation. Openjournals.Library.Sydney.Edu.Au*, 30.

Gargrish, S., Mantri, A., & Kaur, D. P. (2022). Evaluation of memory retention among students using augmented reality based geometry learning assistant. *Education and Information Technologies*, *27*(9), 12891 – 12912. https://doi.org/10.1007/s10639-022-11147-9

Guillermo, S., & Humberto, C. (2019). *Implementation Issues of Student-Centered Learning based Engineering Education in Developing Countries Universities. 2018 World Engineering Education Forum - Global Engineering Deans Council (WEEF-GEDC* (pp. 1–6). https://doi.org/10.1109/WEEF-GEDC.2018.8629701

Hamlin, M. D. (2018). The Application of the Learning Sciences to the Design and Delivery of Student-Centered

Learning Activities. In C. Fitzgerald, S. Laurian-Fitzgerald, & C. Popa (Eds.), *Handbook of Research on Student-Centered Strategies in Online Adult Learning Environments* (pp. 457–481). https://doi.org/10.4018/978-1-5225-5085-3.ch021

Idris, A. L., Husain, H., & Auliah, A. (2021). Pengaruh Metode Mind Mapping Pada Model Pembelajaran Student Facilitator and Explaining Terhadap Hasil Belajar Siswa Kelas X SMA Negeri 5 Tanralili (Studi pada Materi Pokok Hidrokarbon. *ChemEdu (Jurnal Ilmiah Pendidikan Kimia)*, *2*(3), 47–53.

Jacobsen, D. A., Paul, E., & Donald, K. (2009). *Methods For Teaching: Metode-metode Pengajaran Meningkatkan Belajar Siswa TK-SMA*. Pustaka Pelajar.

Karsen, Marini, & S. (2008). *Student Center Learning: Kunci Keberhasilan E-Learning, Makalah Sistem Informasi*. Informatika.

Khalid, S. (2018). Students with Learning Disabilities and Inclusion. *International Journal of Trend in Scientific Research and Development*, *2*(4), 897–901. https://doi.org/10.31142/ijtsrd13102

Khumaidi, K. (2018). Meningkatkan Interaksi dan Motivasi Belajar IPS Siswa Kelas VII SMPN 1 Karangploso Melalui Teknik Student-Centered-Learning. *Cendekia: Jurnal Pendidikan Dan Pembelajaran*, *12*(2), 129–140. https://doi.org/10.30957/cendekia.v12i2.523

Kulakow, S., & Raufelder, D. (2020). Enjoyment benefits adolescents' self-determined motivation in student-centered learning. *International Journal of Educational Research*, *103*. https://doi.org/10.1016/j.ijer.2020.101635

Kusuma, I. A., & Retnowati, E. (2021). Faded-Example Effects in Individual or Group Work Settings. *10th International Conference on Educational and Information Technology (ICEIT*, 204–208. https://doi.org/10.1109/ICEIT51700.2021.9375528

Lampropoulos, G. (2023). Educational benefits of digital game-based learning: K-12 teachers' perspectives and attitudes. *Advances in Mobile Learning Educational Research*, *3*(2), 805–817. https://doi.org/10.25082/AMLER.2023.02.008

Liliawati, W., & Ramlan Ramalis, T. (2009). Identifikasi Miskonsepsi Materi Ipba Di Sma DenganMenggunakan Cri (Certainly of Respons Index) Dalam Upaya Perbaikan Urutan Pemberian Materi Ipba Pada Ktsp. *Prosiding Seminar Nasional Penelitian, Pendidikan, Dan Penerapan MIPA Fakultas MIPA, Universitas Negeri Yogyakarta*, *May 2009*, 159–168.

Lyles, J. K., & Oli, M. (2020). The student-centered classroom: the new gut feeling. *FEMS Microbiology Letters*, *367*(22). https://doi.org/10.1093/femsle/fnaa191

Marhaeni, A. A. I. N. (2008). *Determinasi Beberapa Faktor Afektif yang Mempengaruhi Keberhasilan Belajar Mahasiswa Jurusan Pendidikan Bahasa Inggris Universitas Pendidikan Ganesha*. Lembaga Penelitian Undiksha.

Muhibbuddin, M., Safrida, S., & Nurmaliah, C. (2018). Learning Through a Module Based on Constructivism in Reconstruction Efforts in the Concept of Plant Cells. *IJAEDU- International E-Journal of Advances in Education*, *4*(12), 256 – 262,. https://doi.org/10.18768/ijaedu.478268

Murni, D. (2013). *Identifikasi Miskonsepsi Mahasiswa Pada Konsep Substansi Genetika Menggunakan Certainty of Response Index (CRI)"*. Prosisding Semirata FMIPA Universitas Lampung.

Qureshi, S. A., Mehta, S., Bhagwan, R., & Kumar, R. (2021). *Assessing the effectiveness of syntactic structure to learn code edit representations*. http://arxiv.org/abs/2106.06110

Radford, A. (2009). *Analysing English Sentences: A Minimalist*. Cambridge University Press.

Ramirez, M. (2017). In-Class Flip: Flipping a Literature Class for Student-Centered Learning. In J. Mehring & A. Leis (Eds.), *IIn Innovations in Flipping the Language Classroom: Theories and Practices* (Mehring, J, pp. 93–103). Springer. https://doi.org/10.1007/978-981-10-6968-0_7

Rochmat, C. S., Maulaya, R. D., & Avilya, A. (2022). The Concept And Role Of The Student Centered Learning Model In Adolescent Akhlaq Education Konsep Dan Peran Model Pembelajaran Student Centered Dalam Pendidikan Akhlaq Remaja. *At-Ta'dib*, *17*(2), 232–253. https://ejournal.unida.gontor.ac.id/index.php/tadib/index

Sani, M. (2020). *Improving the Quality of Accounting Education through Student Centred Approach Mustapha Jamiu* (p. 7). https://api.semanticscholar.org/CorpusID:225126593

Sanjaya, H. W. (2011). *Strategi Pembelajaran Berorientasi Standar Proses Pendidikan*. Kencana.

Sbaragli, S., & Santi, G. R. (2011). Teacher's choices as the cause of misconceptions in the learning of the concept of angle. *Education*, *4*(2), 117–157.

Shah, A., Samudra, S., Walters, C., Williams-Dobosz, D., Lannen, A., & Brickman, P. (2020). Students Choice of Group Mates: Avoiding Conflict to Enhance Learning. *The FASEB Journal*, *34*(S1), 1–1. https://doi.org/10.1096/fasebj.2020.34.s1.07578

Shah, I. P. (2019). Comparison of Small Group Discussion vs Lecture Method in Teaching Organon of Medicine to Under Graduate Homoeopathic Students. *International Journal of Medical and Biomedical Studies.Volume*, *3*(8), 196–200. https://doi.org/10.32553/ijmbs.v3i8.491

Shi, R., Tao, L., Saphal, R., Silavong, F., & Moran, S. J. (2023). CV4Code: Sourcecode Understanding via Visual Code Representations. *Springer Science and Business Media Deutschland GmbH*, 291–306. https://doi.org/10.1007/978-3-031-26284-5_18

Siagian, D. T., Maida, N., Irianto, D. M., & Sukardi, R. R. (2023). The Effectiveness of Mnemonic Device Techniques in Improving Long-Term Memory in Learning in Elementary Schools: A Literature Review. *Equator Science Journal*, *1*(1), 24–30. https://doi.org/10.61142/esj.v1i1.4

Soubra, L., Al-Ghouti, M. A., Abu-Dieyeh, M. H., Crovella, S., & Abou-Saleh, H. (2022). Impacts on Student Learning and Skills and Implementation Challenges of Two Student-Centered Learning Methods Applied in Online Education. *Sustainability*, *14*(15), 1–22. https://doi.org/10.3390/su14159625

Sugiyono. (2016). *Metode Penelitian Kuantitatif, Kualitatif, R&D*. IKAPI.

Sumardi, S., Ikhsan, M. K., & Duskri, M. (2020). Analysis of Student Abilities in Solving Mathematical Problems of National Examination at High School Level. *International Journal of Academic Research in Business and Social Sciences*, *10*(6). https://doi.org/10.6007/ijarbss/v10-i6/7327

Tayubi, Y. R. (2005). Identifikasi Miskonsepsi pada Konsep-konsep Fisika Menggunakan Certainty of Response Indeks (CRI. *Jurnal UPI*, *24*(3), 4–9. http://file.upi.edu.

Tesi Muskania, R., & Supena, A. (2021). Learning Strategy Based on Long Term Retention in Islamic elementary school / Strategi Pembelajaran Berbasis Long Term Retention di Madrasah Ibtidaiyah. *Journal AL-MUDARRIS*, *4*(2), 131. https://doi.org/10.32478/al-mudarris.v4i2.682

Tholibon, D. A., Md Nujid, M., Mokhtar, H., Abd Rahim, J., Rashid, S. S., Saadon, A., Tholibon, D., & Salam, R. (2022). The factors of students' involvement on student-centered learning method. *International Journal of Evaluation and Research*, *11*(4), 1637–1646.

Twichell, J. (2020). Active and Student-Centered Teaching and Learning Methods in International Studies at the University of Miami. In *APSA TCL Preprints*. https://doi.org/10.33774/apsa-2020-hqg66.

Ulfah, M. A., Susilowati, E., & Setyowati, W. A. E. (2018). Upaya Peningkatan Rasa Ingin Tahu dan Prestasi Belajar dengan Menggunakan Model Pembelajaran Cooperative Problem Solving yang Dilengkapi dengan LKS Berbasis Drill and Practice pada Materi Hidrokarbon Kelas X-6 Semester Genap Di SMA Negeri Kebakkramat. *Jurnal Pendidikan Kimia*, *7*(2), 284. https://doi.org/10.20961/jpkim.v7i2.25900

Unimed. (2020). *Buku Panduan Tahun Akademik 2019-2020*. Universitas Negeri Medan.

Warner, B. J. (2015). An Exploration of Engagement, Motiviation and Student-Centered Learning in Physical Education. *Journal of Unschooling & Alternative Learning*, *9*(18), 1–14. https://acces.bibl.ulaval.ca/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=eue&AN=101718202&lang=fr&site=ehost-live

Wijayanto, R. (2016). *Variasi Pendekatan Kuliah Tatap Muka Dalam Kaitan Dengan Pemahaman Student Centered Learning*. https://doi.org/10.22437/jmj.v4i1.3116

Williams, H. A. (2019). Phrase and Sentence Structure. In N. Erdogan & M. Wei (Eds.), *Applied Linguistics for Teachers of Culturally and Linguistically Diverse Learners* (pp. 66–102). IGI Global. https://doi.org/10.4018/978-1-5225-8467-4.ch004

Winarsih, W. (2017). Student Centered Learning In English Alive Learning Through Communicative Approach. *IJOLTL*, *2*(1), 45–53.

Wulf, C. (2019). From Teaching to Learning": Characteristics and Challenges of a Student-Centered Learning Culture. In H. A. Mieg (Ed.), *In Inquiry-Based Learning - Undergraduate Research: The German Multidisciplinary Experience* (pp. 47–55). Springer International Publishing. https://doi.org/10.1007/978-3-030-14223-0_5

Безкоровайна, О., & Дищаковська, О. (2020). Interactive Teaching Methods in Foreign Language Learning: Theoretical Analysis of the Problem. *Інноватика у Вихованні*, *2*(11), 56–62. https://doi.org/10.35619/iiu.v2i11.273

Нурбергеновна Мамирова, К. (2021). Principles and methods of student-centered learning (SCL. In *Scientific Work*.