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Research Article

USING MIND MAPS TO ENHANCE GRAMMATICAL COMPETENCE: A CASE STUDY OF SIXTH-GRADE STUDENTS IN A VIETNAMESE ENGLISH CENTER

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Abstract

Teaching of grammar to young learners of the English language often lacks adequate interactivity, thus creating difficulties for students in understanding and remembering abstract concepts. To address this challenge, the present study examines the use of mind maps as a visual learning tool to enhance grammatical competence. A quantitative experimental design with a pre-test and post-test used as instruments was employed. Fifty-eight sixth-grade students participated in the study, and the experimental group was exposed to teaching through mind maps, and the control group was exposed to traditional forms of teaching. The data of the research was collected through grammar tests and then statistically analyzed through SPSS software, utilizing both descriptive statistics and inferential tests, namely independent and paired samples t-tests. It was found that the experimental group scored significantly higher than the control group, and thus, the use of mind maps in grammar teaching was successful in enhancing students' grammatical competence. This work adds value to the area of EFL pedagogy through the use of visual-spatial tools in order to make grammar learning more sensible and meaningful for young students.

Keywords

Grammatical Competence, Mind Maps, young learners, English Centre, EFL

1. Introduction

Grammatical competence, which refers to accurately understanding and using syntactic, morphological, and semantic rules, plays a fundamental role in overall language proficiency (Canale & Swain, 1980; Ellis, 1994). Despite its importance, grammar is often perceived by learners as difficult, abstract, and unengaging, particularly when instruction relies heavily on rote memorization and decontextualized drills (Nassaji & Fotos, 2011; Ur, 2009). Consequently, learners may retain only a superficial and short-term understanding of grammatical structures, which limits their ability to develop a

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solid foundation in grammar.

To overcome these limitations, researchers have emphasized the value of innovative instructional approaches that encourage active learning and support cognitive processing. Interactive and visual techniques have been shown to enhance learners' comprehension, recall, and willingness to participate (Larsen-Freeman & Anderson, 2011; Thornbury, 1999). Among these, mind mapping has gained attention as a powerful tool for organizing, visualizing, and connecting concepts in meaningful ways (Buzan, 2024; Al-Jarf, 2009). By transforming abstract grammar rules into visual-spatial representations, mind maps can make learning more comprehensible and enjoyable, thereby fostering deeper understanding and retention.

Despite its potential, the use of mind mapping in grammar teaching at the secondary school level, particularly in private English centers in Vietnam, has not been widely explored. This gap highlights the central problem of the present study, which is the lack of empirical evidence regarding the pedagogical value of mind maps in addressing students' persistent difficulties with grammar in traditional classrooms. To respond this gap, the research is carried out to address the research question (RQ):

RQ: "How effective are mind maps in enhancing the grammatical competence of sixth-grade students at Giao Lang English Centre?"

In examining the use of mind maps to facilitate motivation in addition to grammatical competence, this research aims to add to the body of work that seeks to develop more active, student-centred language learning environments.

This paper critically reviews a recent study conducted at Giao Lang English Center, Vietnam, which examined the effectiveness of using mind maps to enhance sixth-grade students' grammatical competence and learning motivation. The study adopted a quantitative method and use quasi- quasi-experimental design, integrating quantitative data from grammar tests. It aimed to explore the extent to which mind map-based instruction improves students' understanding of grammar structures, and fosters their engagement toward English learning. The findings indicated that students who participated in mind map activities demonstrated greater grammatical accuracy and better sentence organisation, compared to those taught through traditional methods. Key factors contributing to this improvement included visual learning support, interactive classroom environments, and opportunities for creative expression.

By situating these findings within the broader literature on technology-enhanced and visual learning strategies, this paper provides valuable insights into how mind mapping can serve as an effective pedagogical tool in grammar instruction. It also offers recommendations for English teachers to design communicative, student-centred grammar lessons that promote students' grammar competence. Understanding the pedagogical impact of mind maps on grammar learning is essential for developing innovative and effective instructional practices that cater to young learners' cognitive and affective needs.

2. Literature Review

2.1. English Grammatical Competence

Grammatical competence (GC) refers to the ability to understand and apply grammar rules appropriately in language use. It is recognized as a key component of communicative competence, as it enables individuals who speak different languages to construct grammatically correct sentences and comprehend the underlying principles of language (Canale & Swain, 1980). Another important contribution to the definition of GC came from the Common European Framework of Reference for Languages (CEFR), developed by the Council of Europe (2001). According to the CEFR, GC involves the knowledge and effective use of language's grammatical resources to produce coherent and meaningful sentences.

Celce-Murcia (2007) explained that GC involves understanding and correctly using rules related to words, grammar, sentence patterns, and pronunciation in speaking and writing. Ellis and Shintani (2013) also said that GC is a learner's ability to understand and create grammatically correct structures, which helps with overall language accuracy and fluency. Larsen-Freeman (2015) also stressed that GC was not just a set of rules that learners had to memorise; it was a flexible system that changed as learners used language in different situations.

Overall, GC is an essential part of knowing a language, as it helps learners create, understand, and recognize correct sentences. It is a vital part of language skills that extend beyond mere rule memorization. It involves applying grammatical structures accurately and fluently in communication, contributing to overall language development.

2.2. Teaching of Grammatical Competence

Teaching grammatical competence is a fundamental aspect of language education, involving various instructional approaches to facilitate learners' understanding and application of grammatical rules. Two primary methodologies are the deductive (rule-driven) approach, which is based on explicit rule presentation, and the inductive (rule-discovery) approach, which involves learners discovering rules through guided observation. The deductive method is a traditional teacher-centered approach where learners are explicitly presented with grammatical rules, followed by examples and practice exercises to help reinforce comprehension. This approach suited older learners and those who enjoy explicit explana-

tions since it enables them to comprehend grammar rules before using them (Ellis, 1997). According to Richards and Reppen (2014), deductive teaching could accelerate grammar learning by giving students direct access to rules, enabling them to focus on accuracy in written and spoken communication.

In contrast, the inductive approach is learner-oriented, inviting students to deduce grammatical rules by observing language samples in context. The approach promotes active learning and participation since students examine patterns and deduce grammatical structures from texts, conversations, or tasks. According to Ellis and Shintani (2013), learners who engage in discovery- based grammar learning tend to better understand grammatical rules and their application across various contexts. The approach, however, is time-consuming and demanding, especially for learners who prefer explicit teaching or struggle with tolerating uncertainty.

Table 1. *Deductive & inductive approaches*

Approach	Reasoning Direction	Description
Deductive	General → Specific	Starts from a general rule or theory and applies it to specific cases to draw conclusions.
Inductive	Specific → General	Begins with specific observations or examples and develops general rules or theories from them.

Both deductive and inductive approaches offer valuable strategies for teaching grammatical competence. Therefore, educators should consider their learners' specific needs and preferences, the instructional context, and the nature of the grammatical material when selecting or combining these methods to optimize learning outcomes.

2.3. Mind-maps

Mind, concept, or idea maps are universally known and research-backed instruments for arranging, visualizing, and recalling information in learning and work environments. Fundamentally, mind maps are nonlinear illustrations of ideas, concepts, or information from a central topic, reflecting how the human brain naturally structures thoughts (Buzan & Buzan, 2010). Mind mapping is a technique and a cognitive approach that resonates with how the human brain naturally processes and organizes data (Budd, 2004). As Davies (2011) clarified, mind maps are visual tools that represent concepts and their relationships in a diagram radiating from a central node. Each component is usually linked by lines or arrows, and color coding, symbols, icons, and images are encouraged to make associations easier and more memorable. Their flexibility and adaptability also allow learners to encode information in personally meaningful ways, making them a powerful tool for improving understanding, recall, and engagement in educational contexts (Eppler, 2006).

2.4. Teaching grammatical competence using mind maps

Mind mapping has been recognized as an effective learner-centered approach to grammar instruction because it transforms abstract rules into structured and meaningful visual representations (Novak & Cañas, 2008). Instead of rote memorization or isolated drills, teachers can scaffold grammar learning through three interconnected stages. In the first stage, teachers model grammatical structures using central maps that highlight forms, functions, and examples.

The following figure illustrates the three main stages of grammar instruction using mind maps. In the modeling stage, the teacher presents the target grammatical structure through a central visual map showing its form, function, and examples. The guided practice stage engages students in expanding the map collaboratively to reinforce understanding and connections. Finally, in the independent application stage, students construct their own mind maps and apply grammar knowledge in communicative tasks such as sentence creation or short writing. These stages collectively enhance grammatical competence and learner motivation.

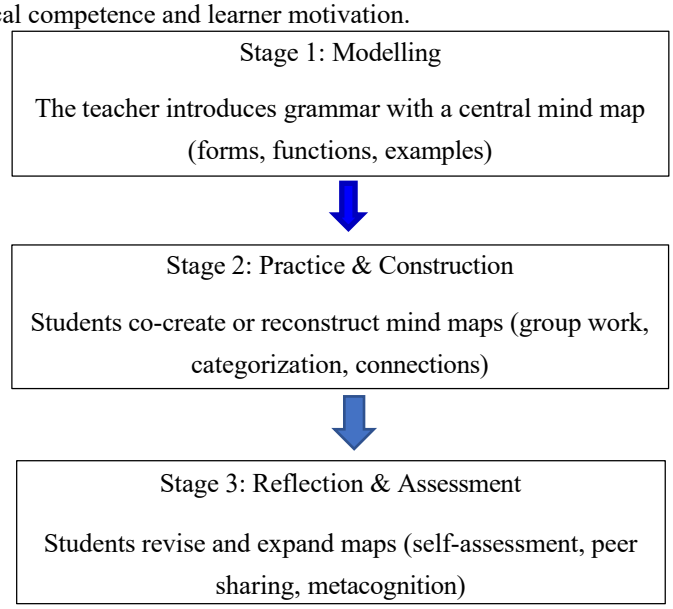

Figure 1. *Stages of teaching grammar with mind maps*

3. Methodology

Research methodology

This study employed a quasi-experimental design within a case study conducted at Giao Lang English Center, a private English language institution in District 2, Ho Chi Minh City, Vietnam. The center follows a structured syllabus tailored for school-aged learners, and the participants in this study were sixth-grade students enrolled in a grammar-based course using the iLearn Smart World 6 textbook, a widely adopted material in EFL contexts in Vietnam.

A convenience sampling method was applied, with two intact classes selected due to their comparable grade level, proficiency, and course structure. In total, 58 students participated, with Class 6A (12 males, 18 females) forming the experimental group, while Class 6B (11 males, 17 females) served as the control group. The experimental group received grammar instruction supported by mind maps as a visual learning tool, whereas the control group was taught through traditional methods without mind maps.

The primary instrument for data collection was a grammar test consisting of short-answer and multiple-choice items aligned with the iLearn Smart World 6 curriculum. It was used in both pre- test and post-test phases to measure students' grammatical competence before and after the six-week instructional intervention. The pre-test, which was the official first-term test developed by the academic term of the center, ensured validity and curriculum alignment. The post-test was adapted based on grammar points taught during the treatment time. It was carried under standard classroom conditions, wherein equal time was given and the teacher was present for standardization and reliability purposes.

Data collection spanned eight weeks. In the first week, both groups completed the grammar pre- test. The following six weeks were devoted to instruction, during which the experimental group received mind map-based grammar lessons, while the control group followed traditional teaching methods. In the final week, both groups completed the grammar post-test. The results provided the basis for comparing changes in grammatical competence between the two groups and evaluating the effectiveness of mind map integration in grammar instruction.

In the process of data analysis, before conducting the Independent Samples t-test, several assumptions were examined to ensure the validity of the results. First, the dependent variable (students' test scores) was assumed to be measured on a continuous scale. Second, the assumption of homogeneity of variances between the two groups was tested using Levene's Test for Equality of Variances. When these assumptions were met, the parametric Independent Samples t-test was applied.

In this study, the effectiveness of using mind maps was evaluated primarily through students' test scores in both the experimental and control groups, focusing on measurable improvements in grammatical competence. While this quantitative approach provided valuable insights into learners' academic progress, it did not capture the broader affective and behavioral dimensions of learning, such as students' engagement, attitudes, and participation during the instructional process. Therefore, a subsequent study will be conducted to investigate student engagement in using mind maps, examining how this visual and interactive technique influences learners' motivation, collaboration, and active involvement in grammar learning. This follow-up research aims to offer a more comprehensive understanding of the pedagogical impact of mind mapping by integrating both cognitive and affective perspectives.

4. Findings and discussions

4.1. Pre-test results of the two groups

Table 2. *Descriptive statistics of pre-test scores for control and experimental groups*

Group	N	Mean	Std. Deviation	Std. Error Mean
Experimental Group	30	7.573	.6638	.1212
Control Group	28	7.471	.6537	.1235

Table 3. *Independent samples t-test results for pre-test scores between control and experimental groups*

Test	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Equal variances assumed	.589	56	.559	.1019	.1732
Equal variances not assumed	.589	55.832	.558	.1019	.1731

The pre-test results for both the experimental and control groups are summarised in tables 2 and 3. The experimental group had a slightly higher mean score of 7.573 compared to the control group's score of 7.471. Both groups showed similar standard deviations, which indicates consistent performance among students. An independent samples t-test was conducted to compare the mean scores, and the result showed a p-value of .559, which means there was no significant difference between the two groups before the intervention; hence,

they began the study with similar levels of grammar knowledge.

4.2. Post-test Results of the Two Groups

Table 4. *Descriptive statistics of post-test scores for control and experimental groups*

Group	N	Mean	Std. Deviation	Std. Error Mean
Experimental Group	30	8.280	.5473	.0999
Control Group	28	7.586	.5911	.1117

Table 5. *Independent samples t-test results for post-test scores between control and experimental groups*

Test	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Equal variances assumed	4.645	56	<.001	.6943	.1495
Equal variances not assumed	4.632	54.819	<.001	.6943	.1499

The post-test results presented in tables 4 and 5 reveal a noticeable difference in performance between the two groups. The experimental group achieved a higher mean score of 8.280, while he control group scored 7.586. The relatively low standard deviations in both groups suggest that students performed consistently within each group, indicating a stable learning outcome without extreme variations. An independent samples t-test was conducted to examine whether the observed difference was statistically significant. The test result showed a p-value of less than .001, confirming a significant difference between the two groups. With a mean difference of .6943, the results clearly favored the experimental group. These results strongly confirm that the effectiveness of mind map-based instruction had a significant and positive impact on students' grammar achievement.

4.3. Pre-test and post-test results of the control group

Table 6. *Paired samples descriptive statistics for the control group's pre-test and post-test scores*

	N	Mean	SD	Std. Error Mean
The pre-test of the control group	28	7.471	.6537	.1235
The post-test of the control group	28	7.586	.5911	.1117

Table 7. *Paired samples t-test results for the control group's pre-test and post-test scores*

Pair -t test	Mean Difference	Standard Deviation	Standard Error Mean	t	df	Sig. (2-tailed)
Pre-test – Post-test (Control Group)	-0.1143	0.9228	0.518	-0.655	27	0.518

Note: The negative mean difference (-0.1143) indicates a slight decrease in the post-test scores compared to the pre-test scores; however, the difference was not statistically significant (p = .518 > .05).

Tables 6 and 7 present the pre-test and post-test results for the control group. According to the data, the mean score slightly increased from 7.471 in the pre-test to 7.586 in the post-test. The standard deviations remained similar, indicating consistent performance across both tests. Besides, a paired samples t-test was conducted to evaluate whether this improvement was statistically significant. The test produced a p-value of .518, which is greater than the threshold of 0.05. This indicates that the slight increase in scores was not statistically significant. Therefore, the traditional instruction used with the control group did not lead to a meaningful improvement in grammatical competence.

4.4. Pre-test and post-test results of the experimental group

Table 8. *Paired samples descriptive statistics for the experimental group's pre-test and post-test scores*

	N	Mean	SD	Std. Error Mean

The pre-test of the experimental group	30	7.57	.664	.121
The post-test of the experimental group	30	8.280	.5473	.0999

Table 9. *Paired samples t-test results for the experimental group's pre-test and post-test scores*

	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
The pre-test of the control group and the post-test of the experimental group	-.7067	.6782	.1238	-5.707	29	<.001

Tables 8 and 9 illustrate the pre-test and post-test results for the experimental group. The mean score improved from 7.57 in the pre-test to 8.280 in the post-test. This reflects a noticeable increase in students' grammar performance following the intervention using mind maps. The standard deviation decreased slightly, suggesting more consistent performance among students after the instruction. A paired samples t-test was conducted to assess whether this improvement was statistically significant. The result showed a mean difference of 0.7067, with a p-value of less than .001, indicating a highly significant improvement.

These findings confirm that the use of mind maps contributed meaningfully to students' understanding, retention, and application of grammar rules. As a result, mind maps can be considered an effective pedagogical tool for enhancing grammatical competence among sixth-grade EFL learners at Giao Lang English Center.

4.5. Limitations and recommendations

Despite the promising results, there are several limitations that need to be considered. Firstly, the sample size was relatively small and specific to sixth-grade students from one English center, which may affect how broadly the findings can be applied to different age groups and educational settings. Secondly, the duration of the intervention took place over a short term; therefore, it focused mainly on immediate outcomes rather than long-term retention or transfer of knowledge. Finally, the study was based mainly on quantitative data, which may not fully capture the depth of learners' experiences or the subtle impacts of mind maps on individual learning processes.

Several directions are suggested to expand on the present study. First, future research should employ a longer timeframe, ideally over several months or an academic year, to evaluate the sustained impact of mind maps on grammar learning. A longitudinal design would provide insights into knowledge retention and the long-term stability of outcomes. Second, researchers should investigate the use of mind maps across other areas of language instruction, including vocabulary, reading, listening, speaking, and writing. Such studies would clarify how mind maps support different cognitive processes and contribute to both receptive and productive language skills. Finally, mixed-methods approaches are recommended to combine quantitative and qualitative data. Integrating test results with interviews, journals, and classroom observations would yield more holistic perspectives on how mind maps influence learners' engagement and comprehension.

5. Conclusion

In conclusion, the findings of this study indicate that incorporating mind maps into grammar teaching can have a meaningful impact on learners' grammatical competence. Students in the experimental group not only outperformed those in the control group. Hence, these findings highlight the value of mind mapping as an effective and learner-centered approach in teaching grammar within the EFL context. Future research with extended timelines, explorations of language areas beyond grammar, and mixed-methods designs would further confirm and enrich the understanding of mind maps in language education.

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