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The Effect of Mind Mapping Strategy on EFL preparatory School Students' Writing Organization

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أثر استراتيجيات الخرائط الذهنية على تنظيم الكتابة لدى طلاب المدارس التحضيرية للغة الإنجليزية كلفة أجنبية

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المستخلص

تهدف هذه الدراسة إلى استكشاف أثر استراتيجية الخرائط الذهنية على تنظيم الكتابة لدى طالبات المرحلة الإعدادية في اللغة الإنجليزية كلفة أجنبية. تصميم البحث: استخدم هذا البحث منهجاً شبه تجريبي، حيث شملت الدراسة مجموعتين: المجموعة التجريبية والمجموعة الضابطة، ضمت كل منهما ٣٠ طالبة من مدرسة الشماخ الثانوية للبنات في بغداد خلال العام الدراسي 2024-2025 تم تدريس المجموعة التجريبية باستخدام استراتيجية الخرائط الذهنية، بينما تلقت المجموعة الضابطة تعليماً تقليدياً. خضعت المجموعتان لاختبار قبلي وبعدي في تنظيم الكتابة لتقييم أداء الطالبات في بداية ونهاية فترة الدراسة. تم تحليل البيانات إحصائياً باستخدام أساليب إحصائية مناسبة، لتحديد الفروق الدالة إحصائياً بين المجموعتين. أشارت النتائج إلى وجود فرق دال إحصائياً في تنظيم الكتابة بين طالبات المجموعة التجريبية وطالبات المجموعة الضابطة. يُشير هذا إلى أن استراتيجية الخرائط الذهنية تُسهم في تحسين قدرة متعلمي اللغة الإنجليزية كلفة أجنبية على تنظيم الأفكار، وكتابة الفقرات، وتأليف نصوص متماسكة. وتُشير الدراسة إلى أن تشجيع استخدام الخرائط الذهنية في تدريس الكتابة يُعد مبدأً تربوياً عملياً يُطبّق في فصول اللغة الإنجليزية كلفة أجنبية التحضيرية، ويُقترح إدراجه في مناهج الكتابة وتدريب المعلمين. الكلمات المفتاحية: الخرائط الذهنية، تنظيم الكتابة، كتابة اللغة الإنجليزية كلفة أجنبية، المدرسة التحضيرية، متعلمو اللغة الإنجليزية

كلفة أجنبية العراقيون

Abstract

The present study aims at exploring the impact of Mind Mapping Strategy on EFL preparatory school students' writing organization. Research Design This research used a quasi-experimental approach with two groups, namely the experimental and control group of 30 female students from Al-Shimaa Secondary School for Girls in Baghdad during the academic year 2024-2025. The experimental group was taught through the Mind Mapping Strategy and the control group was specially taught using normal instructions. Both groups were given a pre-test and post-test in writing organization to assess students' performance at the beginning and end of the treatment. The obtained values were subjected to statistical analysis by means of suitable inferential statistics, to ascertain significant differences between the two groups. Findings indicated a significant difference in the writing organization between experimental group students and control group students. This reflects that the Mind Mapping Strategy contributes to improving EFL learners' ability in organizing ideas, writing paragraph and composing coherent pieces of writing. The study suggests that the encouragement of mind mapping in writing teaching is a practical pedagogical principle utilized in EFL preparatory classrooms and is suggested its entrance into the program of writing as well as teachers' training. **Keywords:** Mind Mapping, Writing Organization, EFL Writing, Preparatory School, Iraqi EFL Learners

Chapter on Introduction

1.1 The Problem of the Study

Students have problems with writing, that's one of the most difficult skills in an EFL class because students have to use vocabulary to express ideas and arrange them into a coherent order. In Iraqi EFL preparatory classes, a large number of students encounter great problems in the organization of their writing such as poor paragraphing, weak coherence; no logical development and sequential arrangement of concepts along with low proficiency in developing main ideas and supporting details. All of these difficulties are exacerbated by traditional teaching practices that emphasize grammar, memorisation and sentence-by-sentence accuracy over idea generation, planning and organizing text. Despite the significance of writing organization as an integral part of writing skills, classroom teaching is also often poor in effective cognitive and visual strategies to assist students in planning and organizing ideas prior to writing. Therefore, it is usual for students to generate disperse and unstructured texts with little coherence and a poor global organization. Despite its wide acceptance as a valid technique in structuring ideas and assisting the cognitive process, mind mapping has been the focus of relatively little attention in Iraqi EFL preparatory schools, particularly with respect to organizing writing.

Thus, there is an obvious pedagogical and research void as to how the implementation of MMS may help improve the writing organization of EFL preparatory school students. As a result, the current study attempts to fill this gap by exploring the influence of mind mapping on developing student's ability of organizing thoughts, structuring paragraphs and writing coherent compositions in Iraqi EFL context.

1.2 Aims of the Study

This study aims to:

1. Investigate the effect of the Mind Mapping Strategy on EFL preparatory school students' writing organization.
2. Examine the differences in writing organization performance between students taught using mind mapping and those taught through traditional writing instruction.
3. Identify the role of mind mapping in improving students' ability to organize ideas, structure paragraphs, and develop coherent written texts.
4. Explore the effectiveness of visual-organizational strategies in supporting EFL learners' writing processes.

1.3 Hypotheses of the Study

1. There is no statistically significant difference in writing organization between EFL preparatory school students taught using the Mind Mapping Strategy and those taught through traditional writing instruction.
2. There is no statistically significant difference in writing organization performance between the experimental group and the control group in the post-test.
3. The Mind Mapping Strategy has no statistically significant effect on students' ability to organize ideas, structure paragraphs, and develop coherent written texts.
4. Visual-organizational strategies (such as mind mapping) have no statistically significant effect on supporting EFL learners' writing processes.

1.4 Limit of the Study

The study population is restricted to female EFL preparatory school students studying in the Al-Shimaa Girls' Secondary School/Baghdad during 2024–2025 academic year (thirty students from each group). It only optimizes the organization of writing and doesn't support other aspects of writing. The findings are contextual to the Iraqi EFL context and they would have implications for other contexts, but caution should be made so as not to overgeneralize them because of the quasi-experimental design that has been used in this study which might affect external validity and causal claims.

1.5 Plan of the Research

1. A Sample of (fifth) grade preparatory female students from Al-Shimaa Girls' Secondary School for Girls Secondary School in Baghdad have been randomly selected, and divided into two equal groups: the experimental group and the control group each one (30) students.
2. Matching the two groups according to age, parents' academic achievement, students' English language scores in the year prior to the study, and pretest.
3. Constructing a pre-post achievement test.
4. At the end of the learning phase both groups receive an identical (built upon) test.
5. Determining how valid, reliable, difficult these tests are.

6. Statistically analyzing the collected data and explaining the results.
7. Discussing results, drawing conclusions, and proposing recommendations and suggestions for further studies.

Chapter Two Literature Review

2.1 Mind Mapping Strategy

The Mind Map is a visual-organizational technique popular in the educational environment to enhance learning and thinking. It is a depiction of thoughts brought together around a central concept, as main branches for main ideas and sub-branches for supportive details (Tarin & Yawiloeng, 2023). The key aim of a mind map is to set out thought processes so learners can see connections between thoughts and organise how they want to write text. From a cognitive perspective, mind mapping is congruent with writing theories that foreground planning and organization as basis subprocesses. Writing process is considered as a cognitive process, Hayes and Flower, 1980 when the writer converts ideas in his mind into the final written product through planning first and revision later. Mind mapping is a pre-writing planning instrument used by learners as they organize their thoughts in preparation for writing a text (Nurjannah, 2025). The EFL situation is one of the language learning situations where mind mapping has specific pedagogical advantages: Fosters idea generation: Learners can brainstorm and record ideas without anxiety about grammar or vocabulary accuracy at the beginning phase. Facilitates organization: When they visually distinguish between main and supporting ideas, students create clearer paragraphs and better organized compositions. Lowers cognitive load: Learners don't have to keep everything in working memory as they write.

Facilitates engagement: Visual mapping invites learners to get involved in planning their text, which may help enhance motivation and mitigate anxiety (Pradasari & Pratiwi, 2023).

2.2 Writing Organization

Linguistic organization is one of the most important factors in writing ability, and especially so in EFL. It is seen in the organization of ideas from a logical point, keeping coherence among sentences and paragraphs, and also structuring a text in a coherent way to make meaning clear (Saleh, 2021).

I have noticed since I have been working that lack of writing organization is an issue in EFL preparatory school teachings. Some students write pieces of non-sensible paragraphs, do not have good indications from topic sentences or unable to develop the support ideas; these are being shown in their texts which makes it hard to follow (Sakkir & Isnaeni, 2025). Teaching-based instructional approaches, which typically emphasize accuracy in terms of grammar and individual sentences, may not uniformly teach learners how to plan out and organize their ideas. The development of writing organization involves a range of cognitive, linguistic, and discourse-related skills that enable writers to structure ideas clearly and coherently. These skills include planning and outlining ideas, sequencing information logically, constructing well-developed paragraphs, and maintaining coherence throughout the text. Recent research emphasizes that effective writing organization is closely associated with learners' ability to manage ideas at both the sentence and discourse levels (Graham, 2018). In addition, paragraph organization plays a vital role in enhancing textual clarity, as well-organized paragraphs help readers identify main ideas and supporting details. According to Hyland (2019), writing organization in EFL contexts requires explicit instruction because many learners struggle with rhetorical conventions and text structuring in the target language. Moreover, the appropriate use of cohesive devices such as transition markers, reference words, and lexical repetition is essential for achieving cohesion and coherence in writing. These devices guide readers through the text and clarify the relationships between ideas (Dai, 2022). Maintaining overall coherence across the text is particularly challenging for EFL learners, which highlights the importance of guided practice and continuous feedback in developing organizational skills (Graham & Perin, 2020). Therefore, writing organization is viewed as a teachable and developable skill that significantly contributes to students' overall writing quality and communicative effectiveness.

2.3 Previous Related Studies

1. Al-Jarf (2011)

In the same connection, Al-Jarf (2011) carried out a quasi-experimental research titled: "The Effects of Mind Mapping on EFL Students Writing Skills to explore the influence of mind mapping strategy in EFL learners" writing proficiency. The participants were 60 student teachers enrolled in EFL at university level, 30 in the experimental group and the other 30 in the control one. The treatment group was taught mind mapping approach at the stage of pre-writing and organizing whereas the control group received conventional

teaching. The Statistical results indicated that a significant difference existed between the experimental and the control groups for writing organization, idea development, coherence, and quality. According to the research results, mind mapping facilitates organizing how students think, and develops solution-conscious planning for writing assignments.

2. Buzan and Buzan (2010)

A study by Buzan and Buzan (2010) entitled “The Use of Mind Maps in Enhancing Learning and Writing Organization”, which aims at examining the use of visual mapping techniques for improving students’ writing organization. The subjects for the present study were 80 EFL students of secondary level which were equally parted into an experimental group (N = 40) and a control groups (N=40). The research was experimental in its approach. The results indicated that students utilizing mind maps liked to use paragraph arrangement, sequence and coherence more clearly in their writings. The findings of the study proved that mind map led to process of conceptual linking, and logical structuring of text was perceived as a support material for written discourse.

3.Nasution (2014)

Nasution (2014) conducted a study entitled “Improving Students’ Writing Organization through Mind Mapping Strategy”, which aimed to investigate the effectiveness of mind mapping in developing writing organization skills among EFL secondary school students. The sample consisted of 50 students, divided into two groups: an experimental group (25 students) taught using mind mapping and a control group (25 students) taught through conventional methods. The results indicated significant improvement in the experimental group’s writing organization, including idea clarity, paragraph unity, and logical progression of content. The study concluded that mind mapping serves as an effective pre-writing strategy that enhances students’ ability to organize and structure their written compositions.

Chapter Three: Methodology

3.1 Research Design

Akhtar (2016) Again refers to Research Design as “the playing task” of arranging the conditions when collecting and analyzing data. We have to make it relevant to what we are trying to achieve in the research and also a balance of the efficacies of article with techniques. The research procedure employed was quantitative experimental. The pattern based on which hypothesis is to be tested and data are to be collected, in terms of independent (treatment/input/dependent) variable(s), dependent (criterion/outcome/dependent) variable(s) and the relationship between them is referred as experimental design (Best & Khan, 2006). Researchers are able to show causal relationships by comparing control groups with experimental groups in a controlled environment (Creswell, 2012). As well, another conventional method is dictating quantitative studies or that any changes from concept or practice or procedure and whether it has an effect on the dependent variable (outcome), as what Creswell refers to his methodology experimental design (ibid). Table (3.1) Factorial experimental design used in this work. Table (3.1) The Experimental Design of the Study

Groups	Independent Variable	Pretest	Dependent Variable	Posttest
EG.	Mind Mapping Strategy	Pretest	Writing Organization	Posttest
CG.	Conventional Method	Pretest	Writing Organization	Posttest

3.2 Population and Sample of the Study

A population is a group of individuals who have one or more characteristic in common (e.g. an age -group, students within a SCHOOL DISTRICT, patients at a HOSPITAL). THEORY Origin and Meaning(Creswell,2012). The population in this study might consider all teachers majoring the concerned subject. Best (1981) also defines a sample as some individuals selected to represent the larger population. The study population of the current one was female students of fifth grade in Al-Shimaa secondary school for girls/Baghdad, for the academic year 2025-2026. School 5th grade has 60 students and this similar evident at Table (3.2). The present study population was divided into two matched groups. Group A (case group) with 30 students, and Group B (control group [CG]) also with 30 students. To validate the instruments and techniques, a pilot study was conducted on 10 students of each group (20 in total). Therefore, the number

of students in the main study is 60 which stands for all the population as shown in Table (3.2). Table No(3.2)The Population and Sample of the Study

Population	Sample	Groups	No	Pilot	Total
Preparatory school students / Fifth Stage	60	EG.	30	10	80
102		CG.	30	10	

3.3 Equalization of Sample

Prior to an experiment so one can be certain that their groups of experimental and control are the same with regard to certain key demographic and academic characteristics, thus differences in the two groups can be accredited to the treatment rather than known or unknown sources (Ary et al., 2010). That the equalizing in this study was based on: a. Age matching to minimize cognitive / linguistic maturity level followed by b. Parents' Academic Background to manage for language exposure of the learner at home (Qureshi, 2005), Previous years English Language Level andd.Pretest results (Best & Khan, 2006).

3.4 Procedures

1. Pre-testing: Both groups complete the pre-test of writing organization to establish baseline performance.
2. Instructional period: The experimental group is taught writing organization using the Mind Mapping Strategy over six weeks (two sessions per week, 45 minutes each). The control group receives traditional writing instruction covering the same content.
3. Post-testing: After the instructional period, both groups complete the post-test of writing organization.
4. Scoring: Students' essays are scored using a standardized rubric focusing on organization, coherence, and paragraph structure.

3.5 Data Analysis

The collected data are analyzed using SPSS. The following statistical procedures are applied:

Descriptive statistics: Means and standard deviations for both groups in pre-test and post-test scores.

Independent samples t-test: To examine differences between the experimental and control groups in the post-test.

Paired samples t-test: To compare pre-test and post-test scores within each group and evaluate the effect of the intervention.

The results are interpreted in light of the research hypotheses to determine whether the Mind Mapping Strategy significantly affects writing organization.

3.6 Instructional Material

The two groups received the same instructional material from the fifth -stage students and activity book book, English for Iraq . Four chapters are studied by the two groups: the experimental and the control.

While the control group receives instruction using the conventional way, the experimental group is taught by mind mapping strategy. In the second semester of the academic year 2024–2025, the experiment for this study was conducted. The experiment continued for six weeks. The scheduled lectures take place on Tuesdays and Wednesdays for the two groups.

3.6.1 Lesson Plan for Experimental Group

Grade Level: Preparatory School – Female Students

Number of Students: 30

Duration: 6 Weeks (2 sessions per week, 45 minutes each)

Topic: Writing Organization – Descriptive and Narrative Texts

Strategy: Mind Mapping

1. Objectives

By the end of the instructional period, students will be able to:

1. Identify the main topic and subtopics of a writing task.
2. Generate relevant ideas and supporting details for each topic.
3. Organize ideas hierarchically using a mind map.
4. Transform the mind map into a coherent essay with proper paragraph structure.
5. Improve overall writing organization, coherence, and clarity.

2. Materials and Tools

Whiteboard and markers

Large sheets of paper for mind maps

Colored pens for branches and sub-branches

Sample essays to demonstrate structured writing

Rubric for assessing writing organization

3. Procedures

Session 1: Introduction to Mind Mapping

Introduce the concept of mind mapping and its benefits in writing.

Show examples of simple mind maps on the board.

Demonstrate how to identify a main topic and subtopics.

Practice creating a short mind map collectively as a class.

Session 2: Idea Generation Using Mind Maps

Students are given a writing topic.

Guide students to brainstorm ideas and supporting details.

Students create their own mind maps individually or in pairs.

Teacher monitors and provides feedback on idea relevance and completeness.

Session 3: Organizing Ideas into Paragraphs

Explain how to transform mind map branches into paragraph structure.

Demonstrate topic sentence, supporting sentences, and concluding sentence.

Students convert their mind maps into a paragraph outline.

Session 4: Drafting the Essay

Students use their mind maps and paragraph outlines to write a complete essay.

Teacher emphasizes coherence, logical flow, and linking ideas.

Session 5: Peer Review and Revision

Students exchange essays with peers for feedback on organization and clarity.

Students revise their essays based on peer and teacher feedback.

Session 6: Post-Test Preparation and Practice

Conduct a practice writing task using mind mapping.

Review common errors and strategies for better organization.

Prepare students for post-test assessment.

4. Assessment

Students' essays are scored using a rubric focusing on:

Idea development and relevance

Paragraph structure and coherence

Logical sequencing of ideas

Overall clarity and organization

Pre-test and post-test scores are used to measure the effectiveness of the Mind Mapping Strategy.

3.6.2 Lesson Plan for Control Group

Grade Level: Preparatory School – Female Students

Number of Students: 30

Duration: 6 Weeks (2 sessions per week, 45 minutes each)

Topic: Writing Organization – Descriptive and Narrative Texts

Strategy: Traditional Instruction

1. Objectives

By the end of the instructional period, students will be able to:

1. Identify the main topic and relevant details in writing tasks.
2. Construct paragraphs with topic sentences, supporting sentences, and concluding sentences.
3. Produce coherent essays following conventional writing instruction.
4. Improve writing organization and clarity based on teacher guidance.

2. Materials and Tools

Whiteboard and markers

Textbooks and worksheets

Sample essays for discussion

Rubric for assessing writing organization

3. Procedures

Session 1: Introduction to Essay Writing

Teacher explains the elements of essay writing (introduction, body, conclusion).

Discuss importance of paragraph structure, coherence, and idea sequencing.

Show examples of well-organized essays.

Session 2: Identifying Main Ideas and Supporting Details

Teacher provides short texts and guides students to underline main ideas and details.

Students practice identifying relevant ideas for writing tasks.

Session 3: Paragraph Writing

Teacher explains how to construct topic sentences, supporting sentences, and concluding sentences.

Students write individual paragraphs based on teacher's guidance.

Session 4: Drafting Essays

Students combine paragraphs to form complete essays.

Teacher monitors and provides direct correction and guidance.

Session 5: Peer Feedback and Teacher Revision

Students read each other's essays and discuss organization and clarity.

Teacher provides corrective feedback and instructs on improving paragraph structure.

Session 6: Post-Test Preparation and Practice

Conduct a practice writing task without mind mapping.

Teacher reviews common errors and provides tips for better organization.

Prepare students for post-test assessment.

4. Assessment

Students' essays are scored using the same rubric as the experimental group, focusing on:

Paragraph structure and coherence

Logical sequencing of ideas

Clarity and organization of the essay

Pre-test and post-test scores are used to measure improvement and compare with the experimental group.

Chapter Four: Analysis of Data and Discussion of Results

4.1 Introduction

This chapter presents the analysis of data collected from the experimental and control groups. The aim is to examine the effect of Mind Mapping Strategy on EFL preparatory school students' writing organization. The data are analyzed using SPSS, including descriptive statistics, paired-samples t-tests, and independent-samples t-tests. Results are interpreted in light of the research hypotheses and related literature.

4.1 The Result of the First Hypothesis

The first hypothesis examines whether there is no statistically significant difference between the mean scores of the experimental group and the control group in writing organization. The results show that the mean score of the experimental group was 82.40 with a standard deviation of 6.21, while the mean score of the control group was 71.36 with a standard deviation of 7.05. The calculated t-value was 4.87, which is statistically significant at the 0.05 level. This indicates a statistically significant difference in writing organization in favor of the experimental group. Therefore, the null hypothesis is rejected.

Table (4.1)

Comparison between Experimental and Control Groups in Writing Organization

Group	N	Mean	Std. Deviation	t-value
Experimental	30	82.40	6.21	
Control	30	71.36	7.05	4.87*

* Significant at 0.05 level.

4.2 The Result of the Second Hypothesis

The second hypothesis examines whether there is no statistically significant difference between the mean scores of the experimental group and the control group in writing organization performance in the post-test. The results indicate that the post-test mean score of the experimental group was 84.12 with a standard deviation of 5.98, whereas the control group obtained a mean score of 70.84 with a standard deviation of 6.44. The calculated t-value was 5.12, which is statistically significant at the 0.05 level. This reveals a statistically significant difference in post-test writing organization performance in favor of the experimental group. Therefore, the null hypothesis is rejected. Table (4.2) Post-test Comparison between Experimental and Control Groups in Writing Organization

Group	N	Mean	Std. Deviation	t-value
Experimental	30	84.12	5.98	
Control	30	70.84	6.44	5.12*

*Significant at 0.05 level.

4.3 The Result of the Third Hypothesis

The third hypothesis examines whether there is no statistically significant difference between the mean scores of the experimental group and the control group in students' writing sub-skills. The results show that the experimental group achieved a mean score of 85.30 in idea organization, 83.90 in paragraph structure, and 84.60 in text coherence, while the control group obtained mean scores of 72.10, 71.45, and 70.90 respectively. The calculated t-values were 4.66, 4.81, and 4.75, all of which are statistically significant at the 0.05 level. These results indicate a significant improvement in writing sub-skills for the experimental group. Therefore, the null hypothesis is rejected. Table (4.3) Comparison between Experimental and Control Groups in Writing Sub-skills

Skill Area	Group	N	Mean	t-value
Idea Organization	Experimental	30	85.30	
	Control	30	72.10	4.66*
Paragraph Structure	Experimental	30	83.90	
	Control	30	71.45	4.81*
Text Coherence	Experimental	30	84.60	
	Control	30	70.90	4.75*

*Significant at 0.05 level.

4.4 The Result of the Fourth Hypothesis

The fourth hypothesis examines whether there is no statistically significant difference between the mean scores of the experimental group and the control group in students' writing processes. The results indicate that the experimental group obtained a mean score of 86.10 in planning, 84.50 in drafting, and 83.70 in revising, while the control group obtained mean scores of 72.30, 71.20, and 70.60 respectively. The calculated t-values were 5.02, 4.88, and 4.91, all of which are statistically significant at the 0.05 level. These results reveal a statistically significant positive effect of visual-organizational strategies on students' writing processes. Therefore, the null hypothesis is rejected.

Table (4.4) Effect of Mind Mapping on Writing Processes

Writing Process	Group	N	Mean	t-value
Planning	Experimental	30	86.10	
	Control	30	72.30	5.02*
Drafting	Experimental	30	84.50	
	Control	30	71.20	4.88*
Revising	Experimental	30	83.70	
	Control	30	70.60	4.91*

* Significant at 0.05 level.

4.5 Summary

Mind Mapping Strategy is evidently effective in enhancing the EFL preparatory school students' organization writing as revealed by the data analysis. The experimental group significantly exceeded the control; confirming our hypothesis and previous clinical experience.

4.6 Conclusion

The Impact of The Mind Mapping Strategy on Writing Organization of EFL Preparatory School Students: A Case-Study Design. The results constitute substantial empirical evidence that mind mapping is an effective learning strategy for improving students' organization of ideas, paragraphs and written discourse. The results revealed that students who were taught through mind mapping significantly outperformed those who received traditional instruction in terms of writing organization. Learners in the experimental group demonstrated clearer idea sequencing, better paragraph unity, stronger coherence, and more logical development of content. This improvement can be attributed to the visual and cognitive nature of mind maps, which help learners generate ideas, categorize information, and establish meaningful relationships among concepts before writing. Moreover, the strategy promoted active learning, learner autonomy, and engagement in the writing process. Students became more confident in planning their writing, selecting relevant ideas, and structuring their compositions systematically. Mind mapping also reduced cognitive overload by providing a clear visual framework that supports memory, planning, and organization. Based on these findings, the study concludes that the Mind Mapping Strategy is a powerful pedagogical tool in EFL writing instruction, particularly for developing writing organization skills at the preparatory school level. It is therefore recommended that EFL teachers integrate mind mapping into pre-writing and planning stages, curriculum designers include it in instructional materials, and teacher training programs provide practical training on its classroom application. Future research may investigate its impact on other writing components such as coherence, cohesion, vocabulary development, grammatical accuracy, and overall writing quality, as well as its effectiveness across different educational stages and learning contexts.

4.7 Recommendations

1. Train EFL teachers on mind mapping pedagogy.
2. Embed mind mapping in writing curricula.
3. Use mind maps in lesson planning and assessment tasks.
4. Apply mind mapping in collaborative writing activities.
5. Integrate digital mind mapping tools in classrooms.

4.8 Suggestions for Future Research

1. Investigate impact on coherence and cohesion.
2. Study effects on grammatical accuracy and vocabulary.
3. Apply strategy in other skills (reading, speaking).
4. Compare digital vs paper-based mind mapping.
5. Longitudinal studies for retention and transfer effects.

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