EFFECTS OF CONCEPT MAPPING ON SENIOR SECONDARY STUDENTS' ACHIEVEMENT IN COMPOSITION WRITING IN PANKSHIN LOCAL GOVERNMENT AREA, PLATEAU STATE, NIGERIA

[1]Akalor Halima Hannah, [2]Precious Ojotule Achia & [3]Smith J. Akoko

[1]*Federal University of Education, Pankshin, Department of English*
halimaonoja@gmail.com thanks
[2]*Federal University of Education, Pankshin, Department of English*
ekeleprecious55@gmail.com
[3]*Federal College of Education (Technical) Ekiadolor, Benin City, Edo State, Department of General Studies Education*
akokosmith93@gmail.com

ABSTRACT

This study was carried out to examine effects of concept mapping on senior secondary students' achievement in argumentative composition in Pankshin Local Government Area, Plateau State, Nigeria. The study utilized the quasi-experimental research design. The population of the study consisted of all the SS II students in Pankshin Local Government Area. A sample of 62 SSII students was selected and assigned to the experimental (concept mapping) and control (conventional) groups using purposive sampling technique. Four research questions and four corresponding null hypotheses guided the study. Data were collected using a test tagged Composition Writing Achievement Test (CWAT), while English Lesson Plans for Teaching Writing aided the treatment. Data collected were analysed using mean and standard deviation to answer the research questions and t-test to test the null hypotheses at 0.05 level of significance. The findings indicate that students exposed to concept mapping achieved higher in generating ideas, constructing sentences, paragraphing, and punctuation. The study concludes that concept mapping has positive effects on students' achievement in composition writing and recommends incorporating concept mapping in teaching techniques, providing resources and support to teachers, and conducting regular assessments to evaluate effectiveness. Based on the findings of the study, it was recommended among other things that teachers of English should model concept mapping for writing to students.

Keywords: Concept Mapping, Teaching, Composition, Achievement

Introduction

Writing is an important means of communicating information which involves translating thoughts, ideas and experience into a readable text using various writing skills. Writing is an essential skill especially in today's world as one's ability to write is crucial for success in most aspects of human endeavor. For instance, in academics, writing is required in the learning of all subjects and it is the primary medium by which students' achievement is assessed. Writing is used for job application, as well as for effective performance of one's task. It is also used in maintaining social links and recording experience. Writing as a language skill is the most difficult and complicated language skill to master, listening and speaking tend to come naturally especially in LI situation. One can also be a good speaker but a poor writer, though some people end up writing better than they speak. But only a few people can write as well as they speak. It is therefore necessary to deliberately cultivate the ability to write not just for academic purposes but also for actual life needs. Al-Shaer (2014) recognizes two approaches in writing skill. The product approach focuses on the production of an error-free piece of writing and the process approach emphasizes on the steps involved in the writing task.

Composition writing is the art of expressing ideas, thoughts, and arguments in a coherent and structured manner. It involves the careful arrangement of words, sentences, and paragraphs to effectively communicate a message or convey information. A well-composed piece of writing exhibits clarity, organization, and logical progression of ideas. According to Al-Shaer (2014) it begins with a strong introduction that grabs the reader's attention and provides a clear thesis statement or main idea. The body paragraphs follow, each containing a topic sentence and supporting evidence or examples that develop and support the main idea. Transitions are used to smoothly connect ideas and ensure a seamless flow of information. Finally, a conclusion summarizes the main points and leaves a lasting impression on the reader. Effective composition writing requires careful planning, attention to detail, and a deep understanding of the topic at hand. It involves choosing the right words and sentence structures to convey meaning accurately and precisely. Additionally, it requires proper grammar, punctuation, and spelling to ensure clarity and readability.

Concept mapping is a visual tool used to organize and represent knowledge or ideas in a hierarchical and interconnected manner. It is a graphical technique that helps individuals or groups to understand complex information, explore relationships between concepts, and foster critical thinking. In a concept map, the main concept or topic is placed at the center, and related concepts are connected to it through lines or arrows (Kenneth, 2019). The relationships between concepts are typically labeled to indicate the nature of the connection, such as "is a part of," "causes," "leads to," or "is an example of." This visual representation allows for a clear depiction of the relationships and interdependencies among different ideas or concepts. Concept mapping has numerous positive effects on students' learning and writing abilities. It enhances organization by enabling students to visually depict the structure and organization of their compositions, resulting in more coherent and logically structured writing. Concept mapping also promotes improved

understanding as students analyze and synthesize information, leading to deeper comprehension of the subject matter and more insightful compositions.

Moreover, it fosters critical thinking skills by encouraging students to evaluate relationships between concepts, make connections, and identify patterns or themes in their writing, contributing to thoughtful and analytical compositions. Concept mapping aids in knowledge retention as students' review and process information, enhancing their ability to draw upon their knowledge effectively while writing. Additionally, concept mapping stimulates creativity and idea generation by allowing students to explore various perspectives, fostering original and innovative compositions. It also supports enhanced communication skills by helping students articulate their ideas clearly and concisely, making their compositions more reader-friendly and engaging. Furthermore, concept mapping promotes metacognitive skills, such as self-reflection and self-assessment, empowering students to evaluate their understanding and refine their writing skills over time. While the specific impact of concept mapping on senior secondary school two students' achievement in composition writing may vary based on instructional strategies, prior knowledge, and individual learning styles, conducting research specific to the local context would provide further insights into its effects.

Statement of the Problem

Many factors have been adduced for students' inability to write effectively at the secondary level. These include use of inappropriate teaching methods and approaches. Many strategies have been used in teaching and learning essay writing, yet students' performance is low. Writing is taught as a product with heavy emphasis on mechanical accuracy and the final product of writing. Khan, Javaid and Farooq (2015) viewed such classes as usually dull and as such, teachers and students view writing as an uphill task. Students are just given topics to write on by teachers and marks are awarded accordingly without teachers' interest in the process of what went into the production of the essay.

Considering the need to improve Senior Secondary School students essay writing skill, it becomes necessary to explore alternative strategies of teaching essay writing. The researcher believes that if modern interactive, concept mapping strategies are employed and properly implemented, this can lead to increased motivation and more positive attitude for students towards composition writing tasks. This can invariably improve students' performance in essay writing. This study therefore investigated the effects of concept mapping on Senior Secondary School Two students' achievement in composition writing in Pankshin Local Government Area of Plateau State, Nigeria.

Aim and Objectives of the Study

The aim of this study is to investigate the effects of concept mapping on Senior Secondary School Students' achievement in composition writing in Pankshin Local Government Area, Plateau State, Nigeria. The specific objectives of the study are as follows:

1. Determine the extent to which instruction in idea generation using concept mapping would affect SS 2 students' achievement in composition writing.
2. Find out the extent to which instruction in sentence construction using concept mapping would influence SS 2 students' achievement in composition writing.
3. Ascertain the extent to which instruction in paragraphing using concept mapping would enhance SS 2 students' achievement in composition writing.
4. Investigate the extent to which instruction in punctuation using concept mapping would impact SS 2 students' achievement in composition writing.

Research Questions

The following research questions are formulated to guide the study:
1. To what extent would instruction in idea generation using concept mapping affect SS 2 students' achievement in composition writing?
2. To what extent would instruction in sentence construction using concept mapping influence SS 2 students' achievement in composition writing?
3. To what extent would instruction in paragraphing using concept mapping enhance SS 2 students' achievement in composition writing?
4. To what extent would instruction in punctuation using concept mapping impact SS 2 students' achievement in composition writing?

Hypotheses

The following null hypotheses are formulated to guide the study and will be tested at the 0.05 level of significance:
1. There is no significant difference in the achievement mean scores of students in idea generation when taught composition writing using concept mapping compared to those who are not.
2. There is no significant difference in the achievement mean scores of students in sentence construction when taught composition writing using concept mapping compared to those who are not.
3. There is no significant difference in the achievement mean scores of students in paragraphing when taught composition writing using concept mapping compared to those who are not.
4. There is no significant difference in the achievement mean scores of students in punctuation when taught composition writing using concept mapping compared to those who are not.

Theoretical Framework

The Cognitive Learning Theory, developed by Jean Piaget and Lev Vygotsky, underpins this study by emphasizing that learners actively construct knowledge through mental processes such as thinking, understanding, and problem-solving. In the context of concept mapping and

composition writing, the theory posits that students enhance their ability to produce coherent and well-structured compositions by visually organizing and connecting ideas, thereby building meaningful cognitive structures. This student-centered approach aligns with the theory's emphasis on active engagement, as concept mapping fosters critical thinking, analysis, and synthesis of information. Rooted in constructivism, the theory supports meaningful learning by encouraging students to integrate new information with prior knowledge through personalized visual representations that reflect individual cognitive styles. Vygotsky's perspective further highlights the role of social interaction and the Zone of Proximal Development (ZPD), where collaborative concept mapping activities promote deeper learning and improve writing through peer support. Additionally, the theory supports the transfer of learning, as students who build strong cognitive frameworks via concept mapping can apply their knowledge across different writing contexts. Overall, Cognitive Learning Theory provides a comprehensive and fitting framework for exploring how concept mapping enhances students' composition writing by supporting cognitive development, active learning, and meaningful engagement with content.

Methodology

The study adopted a quasi-experimental research design involving non-equivalent groups, comprising a pre-test and post-test. The population consisted of SS2 students from secondary schools in Pankshin Local Government Area, Plateau State. The sample was drawn from two randomly selected co-educational day schools with similar characteristics using simple random sampling via balloting, and further divided into experimental and control groups. The instrument for data collection was the Composition Writing Achievement Test (CWAT), developed in alignment with the SS syllabus and WAEC standards, and evaluated through a prepared marking scheme and table of specifications. For validity, the instrument underwent expert review in English education and test measurement, while reliability was ensured through a pilot study and Cronbach's alpha to test internal consistency at a 0.05 significance level. The procedure for data collection spanned eight weeks, involving training of selected teachers from the experimental school in concept mapping, administering the pre-test, implementing the intervention in the experimental group, and finally administering the post-test using the same composition prompt. Research assistants were trained over two days on the use of concept mapping, test administration, and scoring processes, with supervision ensured throughout testing to prevent malpractice. Data collected was analyzed using descriptive statistics (mean and standard deviation) and inferential statistics (independent samples t-test) to test for significant differences between the two groups, with hypotheses accepted or rejected based on a 0.05 level of significance.

RESULTS

Analysis of Research Questions

Research Question One: To what extent would instruction in idea generation using concept mapping affect SS 2 students' achievement in composition writing?

Table 1

Descriptive Statistics of Experimental and Control Groups of Students' Achievement in Idea Generation

| Group | N | Pre-test | | Post-test | | Mean gain |
		x_1	SD_1	x_2	SD_2	
Experimental	31	8.06	1.00	18.87	1.20	10.81
Control	31	8.55	1.00	11.90	1.47	3.35
Mean Difference		**0.49**		**6.97**		**7.46**

Table 1 reveals that the pre-test mean achievement scores of the experimental and control groups were 8.06 and 8.55 respectively with their standard deviation scores of 1.00 and 1.00. The post-test mean achievement scores of the groups were 18.87 and 11.90 respectively with their standard deviation scores of 1.20 and 1.47. The overall mean difference between the mean gains of the two groups was 7.46 in favour of the experimental group. This shows that the experimental group achieved higher in the ability to generate ideas in composition writing than the control group after exposure to concept mapping. This means that SS 2 students who were exposed to concept mapping achieved higher in their ability to generate ideas than those who were taught composition writing without concept mapping.

Research Question Two: To what extent would instruction in sentence construction using concept mapping influence SS 2 students' achievement in composition writing?

Table 2

Descriptive Statistics of Experimental and Control Groups of Students' Achievement in Sentence Construction

| Group | N | Pre-test | | Post-test | | Mean gain |
		x_1	SD_1	x_2	SD_2	
Experimental	31	7.97	1.33	18.13	1.57	10.16
Control	31	7.71	0.97	11.00	1.29	3.29
Mean Difference		**0.26**		**7.13**		**6.87**

Table 2 reveals that the pre-test mean achievement scores of the experimental and control groups were 7.97 and 7.71 respectively with their standard deviation scores of 1.33 and 0.97. The post-test mean achievement scores of the groups were 18.13 and 11.00 respectively with their standard deviation scores of 1.57 and 1.29. The overall mean difference between the mean gains of the two groups was 6.87 in favour of the experimental group. This shows that the experimental group achieved higher in the ability to construct sentences in composition writing than the control group after exposure to concept mapping. This means that SS 2 students who were exposed to concept mapping achieved higher in their ability to construct sentences than those who were taught composition writing without concept mapping.

Research Question Three: To what extent would instruction in paragraphing using concept mapping enhance SS 2 students' achievement in composition writing?

Table 3: Descriptive Statistics of Experimental and Control Groups of Students' Achievement in Paragraphing

Group	N	Pre-test		Post-test		Mean gain
		x_1	SD_1	x_2	SD_2	
Experimental	31	7.74	0.89	18.35	1.02	10.61
Control	31	7.77	0.81	10.58	0.99	2.81
Mean Difference		**0.03**		**7.77**		**7.80**

Table 3 reveals that the pre-test mean achievement scores of the experimental and control groups were 7.74 and 7.77 respectively with their standard deviation scores of 0.89 and 0.81. The post-test mean achievement scores of the groups were 18.35 and 10.58 respectively with their standard deviation scores of 1.02 and 0.99. The overall mean difference between the mean gains of the two groups was 7.80 in favour of the experimental group. This shows that the experimental group achieved higher in the ability to paragraph in composition writing than the control group after exposure to concept mapping. This means that SS 2 students who were exposed to concept mapping achieved higher in their ability to paragraph than those who were taught composition writing without concept mapping.

Research Question Four: To what extent would instruction in punctuation using concept mapping impact SS 2 students' achievement in composition writing?

Table 4: Descriptive Statistics of Experimental and Control Groups of Students' Achievement in Punctuation

Group	N	Pre-test x_1	SD_1	Post-test x_2	SD_2	Mean gain
Experimental	31	6.06	1.03	17.45	1.23	11.39
Control	31	5.10	0.83	7.94	0.89	2.84
Mean Difference		**0.96**		**9.51**		**8.55**

Table 4 reveals that the pre-test mean achievement scores of the experimental and control groups were 6.06 and 5.10 respectively with their standard deviation scores of 1.03 and 0.83. The post-test mean achievement scores of the groups were 17.45 and 7.94 respectively with their standard deviation scores of 1.23 and 0.89. The overall mean difference between the mean gains of the two groups was 8.55 in favour of the experimental group. This shows that the experimental group achieved higher in the ability to punctuate in composition writing than the control group after exposure to concept mapping. This means that SS 2 students who were exposed to concept mapping achieved higher in their ability to punctuate than those who were taught composition writing without concept mapping.

Test of Hypotheses
Hypothesis One
There is no significant difference in the achievement mean scores of students in idea generation when taught composition writing using concept mapping compared to those who are not.

Table 5: Summary of t-test Analysis of the difference in Mean Scores of the Experimental and Control Groups of Students' Achievement in Idea Generation

Group	N	$\overline{X}$	SD	df	$t\text{-}value$	P-value	Decision
Experimental	31	18.87	1.20				
				60	20.428	0.000	Reject $H0_1$
Control	31	11.90	1.47				

At 0.05 level of significance

Table 5 shows that the t-test calculated value was 20.428 with a p-value of 0.000 at df =60. Since the p-value is less than the 0.05 level of significance (P = 0.000 < 0.05), we reject the null hypothesis ($H0_1$) which states there is no significant difference in the achievement mean scores of students in idea generation when taught composition writing using concept mapping compared to those who are not. Therefore, the alternative hypothesis (Ha_1) be upheld and it was concluded that there is a significant difference in the achievement mean scores of students in idea generation when taught composition writing using concept mapping compared to those who are not.

Hypothesis Two
There is no significant difference in the achievement mean scores of students in sentence construction when taught composition writing using concept mapping compared to those who are not.

Table 6: Summary of t-test Analysis of the difference in Mean Scores of the Experimental and Control Groups of Students' Achievement in Sentence Construction

Group	N	$\overline{X}$	SD	df	$t\text{-}value$	P-value.	Decision
Experimental	31	18.13	1.57				
				60	19.564	0.000	Reject **$H0_2$**
Control	31	11.00	1.29				

At 0.05 level of significance

Table 6 shows that the t-test calculated value was 19.564 with a p-value of 0.000 at df =60. Since the p-value is less than the 0.05 level of significance (P = 0.000 < 0.05), we reject the null hypothesis ($H0_2$) which states that there is no significant difference in the achievement mean scores of students in sentence construction when taught composition writing using concept mapping compared to those who are not. Therefore, the alternative hypothesis (Ha_2) be upheld and it was concluded that there is a significant difference in the achievement mean scores of students in sentence construction when taught composition writing using concept mapping compared to those who are not.

Hypothesis Three

There is no significant difference in the achievement mean scores of students in paragraphing when taught composition writing using concept mapping compared to those who are not.

Table 7: Summary of t-test Analysis of the difference in Mean Scores of the Experimental and Control Groups of Students' Achievement in Paragraphing

Group	N	$\overline{\mathbf{X}}$	SD	df	t_{value}	P-value	Decision
Experimental	31	18.35	1.02				
				60	30.444	0.000	Reject $H0_3$
Control	31	10.58	0.99				

At 0.05 level of significance

Table 7 shows that the t-test calculated value was 30.444 with a p-value of 0.000 at df =60. Since the p-value is less than the 0.05 level of significance (P = 0.005 < 0.05), we reject the null hypothesis ($H0_3$) which states that there is no significant difference in the achievement mean scores of students in paragraphing when taught composition writing using concept mapping compared to those who are not. Therefore, the alternative hypothesis (Ha_3) be upheld and it was concluded that there is a significant difference in the achievement mean scores of students in paragraphing when taught composition writing using concept mapping compared to those who are not.

Hypothesis Four

There is no significant difference in the achievement mean scores of students in punctuation when taught composition writing using concept mapping compared to those who are not.

Table 8

Summary of t-test Analysis of the difference in Mean Scores of the Experimental and Control Groups of Students' Achievement in Punctuation

Group	N	$\overline{\mathbf{X}}$	SD	df	t_{value}	P-value	Decision
Experimental	31	17.45	1.23				
				60	34.798	0.000	Reject $H0_4$
Control	31	7.94	0.89				

At 0.05 level of significance

Table 8 shows that the t-test calculated value was 34.798 with a p-value of 0.000 at df =60. Since the p-value is less than the 0.05 level of significance (P = 0.005 < 0.05), we reject the null hypothesis ($H0_4$) which states that there is no significant difference in the achievement mean scores of students in punctuation when taught composition writing using concept mapping compared to those who are not. Therefore, the alternative hypothesis (Ha_4) be upheld and it was concluded that

there is a significant difference in the achievement mean scores of students in punctuation when taught composition writing using concept mapping compared to those who are not.

Discussion of Results

The study investigated the effects of concept mapping on Senior Secondary School Students' achievement in composition writing in Pankshin Local Government Area, Plateau State, Nigeria. The result of the findings in Table 1 revealed that SS 2 students who were exposed to concept mapping achieved higher in their ability to generate ideas than those who were taught composition writing without concept mapping. The finding of the study is in line with the study by Sukranengrat, Marhaeni and Padmadewi (2014) who investigated the Effect of Concept Mapping and Self-Regulation on Students' Writing Competency. The study found that there is a significant difference in writing competency between the students taught with Concept Mapping and those taught with conventional technique. The study recommended that Concept Mapping should be used in teaching writing as an alternative method to solve problems of students' low writing competency, especially in organizing ideas. The findings of the study also concurred to the study by Maloho (2017) carried out a research on "Using Concept Mapping to Improve the Writing Ability of the Eight Graders. The result of the study indicated that that concept mapping was successful in improving the students" writing ability in the aspect of organizing ideas.

Similarly, the findings of the study in Table 2 revealed that SS 2 students who were exposed to concept mapping achieved higher in their ability to construct sentences than those who were taught composition writing without concept mapping. The findings of the study concurred with findings of the study by Ebrahimi and HadaviZade (2022) who carried out a research on "The Effect of Computer-Based Concept Mapping Learning Strategy on Iranian Intermediate EFL Learners' Writing Accuracy and Fluency. The results revealed that the computer-based concept-map group outperformed on the post-test of writing accuracy in sentence construction than the control group, but writing fluency of both groups appear to have been unaffected by the experiment. The findings of the study conformed to that of Gowon and Yashim (2022) who carried out a research on "Effects of concept mapping strategy on sentence construction, paragraphing and editing in junior secondary schools students' composition writing achievements in Kafanchan Education Zone, Kaduna State, Nigeria. The found that concept mapping instruction significantly improved students' ability to construct a cohesive sentence, develop a paragraph, and edit composition writing.

Also, the findings of the study in Table 3 revealed that SS 2 students who were exposed to concept mapping achieved higher in their ability to paragraph than those who were taught composition writing without concept mapping. The result of the study concurred with that of Nobahar, Tabrizi and Shaghaghi (2013) who carried out a study on "Effect of concept mapping on the academic performance of students in selected secondary schools in Kanke Local Government Area of Plateau State". The study was discovered that those who were taught using concept mapping method performed better in writing (punctuations and paragraphing) than those who were taught using the lecture method.

In addition, the findings of the study in Table 4 revealed that SS 2 students who were exposed to concept mapping achieved higher in their ability to punctuate than those who were taught composition writing without concept mapping. The result of the study concurred with that of Dungbale (2019) who carried out a research on "Effects of using concept mapping in teaching letter writing in Senior Secondary Schools in Mangu Local Government Area." The result of the study showed that the students before they were exposed to instruction on letter writing through concept mapping had a total mean score of 7.2, in the post test, students after being exposed to instruction through concept mapping made a remarkable progress with a total mean score of 12.7, in pre-test, the students were discovered to misarranged the addresses in the formal letter, however, in the post test they made a very good improvement in punctuations and paragraphing.

The findings of the study in Table 5 with respect to research hypothesis one revealed that there is a significant difference in the achievement mean scores of students in idea generation when taught composition writing using concept mapping compared to those who are not. This finding concurred with the study by Shakoori, Kadivar and Sarami (2017) who found that there is a significant difference in the students' performance in letter writing between those taught with concept mapping and those taught with conventional method. The result of the findings in Table 6 with respect to hypothesis two revealed that there is a significant difference in the achievement mean scores of students in sentence construction when taught composition writing using concept mapping compared to those who are not. The findings of the study is in agreement with that of Gowon and Yashim (2022) who found that there is a significant difference between the achievement of the experimental group and the control group in construction, paragraphing and editing. The findings of the study in Table 7 in respect to hypothesis three revealed there is a significant difference in the achievement mean scores of students in paragraphing when taught composition writing using concept mapping compared to those who are not. Also, the result of the study in Table 8 revealed that there is no significant difference in the achievement mean scores of students in punctuation when taught composition writing using concept mapping compared to those who are not. This finding conformed to that of Gowon and Yashim (2022) who found that concept mapping strategy has significant effects on sentence construction, paragraphing, punctuations and editing in composition writing achievement skills of junior secondary school students.

Summary of Findings

The findings of the study revealed that:

1. Students who were exposed to concept mapping achieved higher in their ability to generate ideas than those who were taught composition writing without concept mapping.
2. Students who were exposed to concept mapping achieved higher in their ability to construct sentences than those who were taught composition writing without concept mapping.
3. Students who were exposed to concept mapping achieved higher in their ability to paragraph than those who were taught composition writing without concept mapping.

4. Students who were exposed to concept mapping achieved higher in their ability to punctuate than those who were taught composition writing without concept mapping.

Conclusion

From the findings of the study, it was concluded that concept mapping has positive effects on Senior Secondary School Students' achievement in composition writing. It was also concluded the use of concept mapping improves students' abilities to generate ideas, construct sentences, paragraph and punctuate correctly in composition writing. Concept mapping can also be utilized as a collaborative tool. It allows students to share their perspectives, brainstorm ideas, and collectively construct knowledge. Collaborative concept mapping encourages group discussion, enhances communication skills, and promotes a shared understanding of complex topics among students. Concept mapping has applications across various disciplines and educational settings. It can be used in classrooms as a teaching tool, empowering students to create their own concept maps to demonstrate their understanding of a subject.

Recommendations

From the findings of the study, the following recommendations were made:

1. Teachers of English language should incorporate concept mapping in their teaching techniques to improve their students' writing skills.
2. Government should provide resources to schools to train teachers on effective use of concept mapping in teaching writing skills.
3. School management should support teachers in the implementation of concept mapping by providing the necessary teaching aids to facilitate better understanding.
4. Stakeholders in English education should encourage schools to prioritize concept mapping in writing instruction to improve students' achievement.

References

Al-Shaer, I. M. R. (2014). *Employing concept mapping as a pre-writing strategy to help EFL learners better generate argumentative compositions.* International Journal for the Scholarship of Teaching and Learning, 8(2), Article 10.

Dungbale, T. P. (2019). *Effects of using concept mapping in teaching letter writing in senior secondary schools in Mangu Local Government Area* (Unpublished undergraduate project). Federal College of Education, Pankshin.

Ebrahimi, F., & Hadavizadeh, N. (2022). The effect of computer-based concept mapping learning strategy on Iranian intermediate EFL learners' writing accuracy and fluency. *International Journal of Language and Literature, 10*(1), 32–40.

Emmanuel, D. (2018). *Effect of concept mapping on the academic performance of students in selected secondary schools in Kanke Local Government Area of Plateau State* (Unpublished undergraduate project). Federal College of Education, Pankshin.

Gowon, R. T., & Yashim, M. A. (2022). Effects of concept mapping strategy on sentence construction, paragraphing and editing in junior secondary schools students' composition writing achievements in Kafanchan Education Zone, Kaduna State, Nigeria. *International Journal of Language and Communication Studies, 3*(2), 45–56.

Kenneth, M. A. (2019). *The use of concept mapping strategy in English writing: A practical guide*. Lagos: Academic Publishing House.

Khan, A., Javaid, A., & Farooq, U. (2015). Improving writing skills through process approach. *Journal of Education and Educational Development, 2*(1), 48–63.

Malaho, M. A. (2017). Using concept mapping to improve the writing ability of the eighth graders. *Journal of Language Teaching and Research, 8*(5), 951–957.

Nobahar, B., Tabrizi, A. R. N., & Shaghaghi, M. (2013). The effect of concept mapping on Iranian intermediate EFL learners' self-efficacy and expository writing accuracy. *Theory and Practice in Language Studies, 3*(11), 2117–2127.

Shakoori, M., Kadivar, P., & Sarami, R. (2017). The effect of concept mapping strategy as a graphical tool in writing achievement among EFL learners. *International Journal of Information and Education Technology, 7*(5), 357–360.

Sturm, J. M., & Rankin-Erickson, J. L. (2002). Effects of hand-drawn and computer-generated concept mapping on the expository writing of middle-school students with learning disabilities. *Learning Disabilities Research & Practice, 17*(2), 124–139.

Sukranengrat, N., Marhaeni, A. A. I. N., & Padmadewi, N. N. (2014). The effect of concept mapping and self-regulation on students' writing competency. *International Journal of Language and Literature, 2*(1), 35–41.