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# Effects of concept mapping strategy on sentence construction, paragraphing and editing in junior secondary schools students' composition writing achievements

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This study investigated the effects of concept mapping on sentence construction, paragraphing, and editing in composition writing achievement of secondary school students in Kafanchan Education Zone, Kaduna State Nigeria. The study answered three research questions and tested three hypotheses. Quasi-experimental (non-equivalent pre-test-post-test control group design) research design was employed for the study. The population of the study included all the 1,242 Junior Secondary School two (JS II) students in 35 public secondary schools in Kafanchan Education Zone of Kaduna State. Sample of 66 students from two intact classes (experimental group = 36, control group = 30) participated in the study. Students in the experimental group received 8-weeks of training on concept mapping instruction, while those in the control group were exposed to normal conventional teaching. Students' composition writing achievement test (SCWAT, test-retest reliability = 0.78) was developed by the researcher to obtain baseline information and after-intervention information. Data were analyzed using descriptive statistics [means and standard deviation (SD)] and analysis of covariance (ANCOVA). Results indicated that students have the very low ability in sentence construction, paragraphing, and editing in composition writing achievement at baseline. Also, concept mapping instruction significantly improved students' ability to construct a cohesive sentence, develop a paragraph, and edit composition writing. The study concluded that concept mapping strategy has significant effects on sentence construction, paragraphing, and editing in composition writing achievement

skills of junior secondary school students. The study strongly recommended the use of a concept mapping strategy by teachers, students, and school administrators in Nigeria.

#### KEYWORDS

**concept mapping, sentence construction, paragraphing, editing, composition writing achievement, junior secondary school students**

## Introduction

Writing is an intellectual and critical activity of inscribing graphic symbols from oral words or thoughts that are expressed and arranged on a surface to make statements that are expected to be understood by other people known as the readers. It also serves the function of transmission and storage of information that could be retrieved when required. Writing plays a vital role in the school setting as it can effectively facilitate instruction in different school subjects, gather information from different sources, and also be used as a basis to test learning and check levels of intelligence.

Developing ideas to make a comprehensive whole piece of writing in any language, the especially English language is undertaken through composition writing. In this study, composition writing is a process of building longer units of writing from smaller elements. These smaller units of writing include different types of words, phrases, sentences, and paragraphs. To have meaningful writing, the effective composition must come to play through grammatically correct sentence construction which enables students to grammatically and lexically construct and link related sentences in paragraphs to enhance meaning; paragraphing which in turn enables the students to communicate ideas logically from one general idea to the other and quality editing which enable students to read through their compositions making the words and sentences clearer and more meaningful before writing the final draft. These are important tasks in composition writing. Composition writing achievement in this study refers to the scoring of the student's composition after tests to identify the low, average, high, and excellent achievers.

For English in Nigeria, the English language is taught and learned in a multilingual setup, either as a second language or a third language. This is despite that it is the official language of communication and also a means of instruction from upper primary school (classes 4–6), the language is taught as a subject in the lower primary (classes 1–3) ([National Policy on Education, 2014](#)). Consequently, most pupils are not grounded in the English language skills of reading and writing. When they move to junior secondary school where they are expected to develop the mastery of these two skills which are the main skills needed for their current and future academic enhancement,

most of them grapple with these tasks. As important as writing or composition writing is to secondary school students, it is only taught once a week as part of an English language lesson in the curriculum and not as a school subject to be taught either twice or thrice a week.

WAEC English Chief Examiners' Report of 2018 and 2019, indicated that students' written compositions in Kaduna State, Nigeria, were sketchy and unorganized, indicating very low mastery of content. Baseline data have revealed that writing in English as a second language is a difficult task for students and many teachers teach writing without using practical writing strategies ([Okeke, 2010](#)). In addition, writing lessons are taught using explanations about issues and ideas while students are given related topics to write on, without providing many practical activities such as concept mapping which might improve the achievement of students in written compositions as it stimulates critical thinking at both individual and group levels ([Muhammad, 2016](#); [Aziza, 2019](#)). Many studies have attempted to improve composition writing among students at different levels through several strategies but not concept mapping strategies. This study is therefore hinged on the desire to investigate if the use of a critical and practical technique of concept mapping strategy can enhance composition writing achievement among junior secondary school students in Kaduna State.

## The present study

To guide the study, the following parameters were developed and drawn up: The study aimed to determine the effects of concept mapping on sentence construction, paragraphing, and editing in composition writing achievement of junior secondary two students in the Kafanchan Education zone. The specific objectives of this study were to determine the levels of cohesion in sentence construction, paragraphing, and editing in composition writing achievement of students at the baseline and after exposure to concept mapping strategy; investigate the effects of concept mapping strategy on students' ability to construct cohesive sentences, write coherent paragraphs and edit written compositions. Based on the objectives of the study, the following research questions were raised: What are the levels

of students' ability to construct cohesive sentences, organize coherent paragraphs, and edit composition writing before and after exposure to concept mapping strategy? The following hypotheses were also generated for the study: There is no significant difference between the experimental and control groups of students' ability to construct cohesive sentences, write a coherent paragraph, and edit composition writing after exposure to the concept mapping strategy.

This study was hinged on Piaget's Constructivists' theory of 1971. Piaget was a philosopher from Switzerland who studied cognitive development and learning theories. It is a learning or meaning-making theory that explains the nature of knowledge and how humans learn. It supports the principles of collaboration, interaction, and active learning to enhance and retain meaning. The theory focuses on how learners construct meaning commensurate to their background experiences as they interact with new ideas. The theory is related to this study in the use of concept mapping for learning the fact that it is based on creative and cognitive learning with the teacher as the facilitator. Concept mapping allows the students to use their cognitive abilities to construct their meaning on given concepts as they interact collaboratively with their classmates to develop ideas for composition writing before the actual writing tasks. The findings of this study are therefore hoped to be of immense benefit to students, teachers who teach writing compositions, school supervisors, and the Kaduna State Ministry of Education.

## Literature review

Composition writing according to Baird and Wilkerson (2021), is the act of assembling words in the correct order to communicate meaning in writing to readers. It includes creative write-ups in the form of novels, short stories, poems dramas, and different kinds of music or essay compositions (Treasure, 2022). Treasure (2022) further explains that composition writing requires taking ideas and compiling them in order so that readers would recognize and comprehend relationships between ideas, concepts, commentaries, or arguments. The fact that composition writing allows students to learn to convey ideas, opinions, emotions, feelings, arguments, and various ways of communicating verbally or in writing, makes composition writing a very useful skill and tool for educational development. The National Examination Council's (2018) syllabus developers highlighted narration, description, argumentation, debate, exposition, letters, and article writing as different kinds of composition writing.

Structurally, any kind of composition writing has three basic elements. The introduction, body, and conclusion (Mohammed, 2021). The first element which is the introduction clarifies the topic and gives it a good background. The body discusses the main ideas with supporting details in paragraphs. The conclusion according to Abdalla (2021), is the composition

element that summarizes the main points discussed in the body. It is aimed at helping the reader recapitulate and remember the main focus of the write-up. Meaningful composition writing is obtainable through coherent sentence construction, effective paragraphing, and quality editing of the piece of writing.

The sentence is the highest unit of expression that gives a complete thought. It starts from the morpheme, word, phrase, and clause (Macaro, 2001). Sentence construction refers to the way a sentence is arranged grammatically. In writing, sentences are constructed in sequence with meaning flowing from one sentence to another, conveying views and relationships. This requires the proper use of relevant words and punctuations to express a complete thought (Anyebe, 2017). Studies have shown that coherent sentence structure can help to have a framework for clear written expression of our thoughts and communications in writing (Jimenez, 2017). In another study, Russel (2016) recommended the use of concept mapping to master words and phrases that show relationships and linking phrases that show cause and effect or tell about the order of events. Holschuh and Nist (2000) highlighted that concept maps help students to identify concepts, and understand and see relationships. For enhancement of writing, the researchers noted that this can be achieved by linking words and phrases which help to achieve cohesion and coherence in composition writing.

Paragraphing has to do with a unit of thought in a connected composition of sentences that contain the main idea expressed in a sentence known as the topic sentence (Silva, 2003). Paragraphing is the act of expanding the topic sentence which could be through definition, explanation, or illustrations. Thus, a paragraph contains a series of sentences organized coherently and related to a single idea that relates to a broad topic (Mohammed, 2021). In a study conducted by Bukhari (2016), the researcher discovered that learners who were taught composition writing using a mind map improved in sentence cohesion and coherence, content paragraph structure, and length in writing. Talinn (2016) also found out that concept maps can facilitate language learning with special gains in learning verbs, and new vocabularies in reading and writing which have to do with sentences and paragraphs.

Editing is a stage in the writing process whereby a writer makes efforts to improve the write-up by correcting errors in words, sentences, and paragraphs to enable them to communicate information as effectively as possible (Oyedele and Chikwature, 2019). Editing can lead to clarification of ideas, re-imaging images, or rethinking of novel approaches to the subject of the written discussion. According to Abdalla (2021), some of the most effective editings involve tightening and shortening a piece of writing to make it better. Editing helps the writer to look at each sentence carefully and makes sure it is well constructed to convey the meaning it is supposed to convey. Paudel et al. (2019) studied editing as a craft in academic writing and concluded that editing is the most important in making a document

formal, objective, accurate, consistent, logical, and meaningful to whoever will use it.

Furthermore, the composition writing achievement of students depends on their level of proficiency in sentence construction, paragraphing, and editing among many elements (Trapman et al., 2018). Despite the high level of competency requires in composition writing, the performance of junior secondary students in the English Language, especially the composition aspect at the secondary school level has been poor in Nigeria. WAEC Chief Examiners' Resume Report of 2019, indicated that students' compositions in Kaduna State Nigeria, were sketchy and unorganized, indicating very low mastery of content. Baseline data have revealed that writing in English as a second language is a difficult task for students and many teachers teach writing without using practical writing strategies (Okeke, 2010). The Okeke (2010) explained that one of the factors responsible for the mass failure of secondary school students in the English language in Nigeria as an academic discipline is as a result of poor strategy in composition writing.

Concept mapping was developed as a pedagogical and instructional tool by Joseph Novak in the late 1970s to improve teaching and learning in Education. In the same vein, Canas and Novak (2008) were the first scholars who noted that the application of concept mapping by teachers and students is widely acknowledged in educational settings because of its effectiveness in enhancing learning. Activity-oriented, problem-based, and concept mapping strategies have received acceptance as a means of helping students to actively engage in the learning process as highlighted by these scholars, Khoshshima et al. (2016) and Muhammad (2016). They explained and discussed that these practical-based strategies especially, concept mapping offers a significant improvement in sentence construction, paragraphing, and editing in composition writing among secondary school students.

In concept mapping, students construct concept maps by identifying key terms or ideas, placing those key terms in notes, drawing lines that link related terms, and writing a description of the nature of the relationship along with the link (Karpicke, 2018). Concept mapping can be achieved in educational settings in a variety of ways, especially in both reading and writing tasks. Students can create concept maps as they study on their own while they read a textbook or other learning materials. Also, teachers and students can construct maps as a collaborative classroom activity. Concept mapping may be used for a wide variety of purposes, including creative brainstorming, note-taking, and outlining among many pre-writing activities. Razeq and Abualhommos (2019) confirmed that concept mapping used effectively can enhance students' writing in all areas of the composition.

Empirical evidence has shown that concept mapping improved the essay writing achievement of students. For example, Muhammad (2016) investigated the effects of using concept mapping as a pre-writing strategy on Iraqi English as a

Foreign Language (EFL) students' achievement in essay writing. The result indicated that there was a significant development in students' achievement in idea organization, editing content, style, and quality expression in essay writing skills. Also, significant effects of mind mapping on English vocabulary used in the writings of learners of English as a foreign language by Maibodi (2017) and Trang (2017), have been reported. Employing a concept mapping strategy as a graphical tool was found to significantly enhance writing achievement among EFL learners, reduce writing anxiety, and enhance accuracy (Shakoori et al., 2017; Zarei and Feizollahi, 2018). Likewise, Muhammad (2016) found that using concept mapping and mind mapping was effective in descriptive and narrative writing classes. In a similar study, Aziza (2019) examined the use of modified video and mind mapping in teaching writing and observed that students writing magnificently improved.

In a related development of using the activity-based approach in teaching writing composition, Bitrus (2015) and Echoga (2018) investigated the effects of workshop and conference methods on the performance of senior secondary students' written composition in Kaduna and Plateau States Nigeria and found that these methods significantly improved students' written compositions. In Nigeria, Owolabi and Adaramati (2015) and Anyebe (2017) in their various studies regarding the use of graphic organizers in teaching English as a foreign language, observed a positive achievement in English vocabulary development and appreciation of English Literature. Assessment of the reviewed studies indicated a dearth of empirical investigations about the effects of concept mapping on sentence construction, paragraphing, and editing in composition writing achievement among junior secondary school students in Nigeria. Negligence in addressing these issues may yield to a continuous decline in the general performance of students not only in the English language but in all the subjects taken by the students. The present study sets out to use concept mapping as a means to improve students' skills of sentence construction, paragraphing, and editing in composition writing.

## Methods and procedures

### Research design

The study adopted Quasi-Experimental (non-equivalent pre-test-post-test control group) design. This design consisted of two intact groups: experimental and control groups where only the experimental group received the intervention (Cohen et al., 2007). The quest to avoid the consequences of disrupting the normal academic schedules of the school warranted the adoption of the design. Participants in the experimental group were trained for 8 weeks on concept mapping pre-writing strategies whereas, those in the control group were withheld from the intervention.

## Population and sample

The population for this study comprised all the students from the 35 public junior secondary schools in the Kafanchan Education Zone of Kaduna State. The junior secondary school students included both single and co-education schools with a population of 221 males and 2,530 females with a total of 4,747 students (Statistics of Junior Secondary School Students in [Kafanchan Education Zone, 2021](#)) This population was made up of mostly adolescent students with ages ranging from 13 to 15 years. They came from semi-urban and rural areas of southern Kaduna of Kaduna State. Junior secondary students in Nigeria are the students within the phases of education in state secondary schools equivalent to the 7, 8 and 9th grades. This phase serves as a bridge between the primary and secondary school levels.

The total number of JS II students only was 1,242. Two Junior Secondary Schools were selected using the simple random sampling technique from the 35 junior secondary schools in the zone. A sample of one intact class each from the two schools was also randomly selected and randomly assigned to the experimental and control groups. A Sample of 66 (male = 31, female = 35) students participated in the study. Thus, 36 students in an intact class formed the experimental group while the 30 students in another intact class constituted the control group. The experimental group was taught using the concept mapping strategy while the control group was taught using the conventional method.

## Research instrument

The researchers used the Students' Composition Writing Achievement Test (SCWAT) to obtain data from the participants. The instrument was developed according to the Junior School Certificate Examination standard developed by the Education Resource Centre, Ministry of Education, Kaduna State Nigeria. The instrument was meant to test some specific writing skills which include sentence construction, paragraphing, and editing. SCWAT had two parts, part one consisted of students' demographic data such as gender and age, while part two was made up of an analytical composition. In the analytic scale, scripts were rated on aspects of writing such as content, grammatical accuracy, use of tenses, spelling, text organization (coherence and cohesion) punctuation, paragraphing, and others ([Galti et al., 2018](#)). Scores obtained were categorized as very low, low, high, and very high. Students' composition writing achievement test was validated by two professionals in the English Education Unit and one expert in the Research, Test, and Measurement Unit from the University of Jos. Test-retest reliability was established for the instrument and the result yielded a 0.78 test stability coefficient.

## Procedure

The researchers initially contacted the school authority/principals and presented a letter of introduction from the Department of Arts and Social Sciences, Faculty of Education University of Jos, Nigeria. The letter was to seek the consent of the various school heads, gain approval, and request to use part of their school resources. Thereafter, the researchers gave a consent letter to the students to fill out and sign for ethical consideration. The approval was obtained before embarking on the study. Initial data was obtained as a pre-test using SCWAT before intervention. Equally, a post-test was obtained using a direct method of administration after 8 weeks of an intervention program.

Students were guided and directed to complete the instrument independently after reading the introductory letter and instructions. They were instructed to write the SCWAT within 45 min and return it directly to either the researcher or research assistants who were present. The researchers later appreciated the time and efforts of the participants and research assistants. Participants were made aware that their responses will be treated with a serious sense of confidentiality.

## Experimental procedure

Two research assistants were trained for 3 days and they assisted throughout the study. The experimental group was managed by the researchers. Participants in the experimental group were taught with concept mapping strategy. The teaching enabled students to go through the process approach of writing skills in sentence construction, paragraphing, and editing. The training lasted for 8 weeks. The teachings were conducted during the school hours using the normal two double periods (40 min each), totaling 80 min a week, of the English Language school timetable for the intact classes. Before and after the intervention program, participants were given SCWAT to write.

At the same time, the control group was managed by the research assistants. The participants were exposed to conventional teaching while concept mapping strategy was withheld from them. The control group was taught English language lessons as indicated on the timetable using the conventional method. They were taught using the same prescribed textbook used for the experimental group and given homework with no directives on the writing skills relating to concept mapping. Like the control group counterpart, the placebo was carried out during the school hours using the normal two double periods (40 min each), totaling 80 min a week, of the English Language school timetable for the intact classes. Students' composition writing achievement test was issued to them where they wrote the composition before and after the control group placebo administration.



## Data analysis

Data obtained from the respondents' compositions were analyzed using descriptive statistics [means and standard deviation (SD)] to measure the levels of sentence construction, paragraphing, and editing in composition writing skills before and after the intervention. Also, analysis of covariance (ANCOVA) was used to test the hypotheses at the 0.05 level of significance. This tool tested the significant difference in the post-test mean scores of sentence construction, paragraphing, and editing in composition writing between the experimental and control groups while controlling the effects of pretest scores.

## Results

Results are presented according to the research questions and hypotheses.

### Students' ability to construct cohesive writing before and after concept mapping strategy

**Table 1** presents question one results. The finding indicates that the pre-test mean scores of the experimental group were 5.56, with a SD of 2.54, while that of the control group was 6.00, with an SD of 2.12 which were both low. Subsequently, the post-test mean score and SD of the experimental group were 12.64 and 2.09, respectively, while that of the control group was 8.59 and 2.35, respectively. It implies that the concept mapping strategy enhances students' ability to construct cohesive writing.

**TABLE 1** Level of students' ability to construct cohesive writing and organize coherent paragraph before and after exposure to concept mapping instruction.

Test	Group	N	$\bar{X}$	SD	Level
<b>Construct cohesive writing</b>					
Pre-test	Experimental	36	5.56	2.54	Low
	Control	30	6.00	2.12	Low
Post-test	Experimental	36	12.64	2.09	High
	Control	30	8.59	2.35	Low
<b>Organize coherent paragraph</b>					
Pre-test	Experimental	36	3.39	1.47	Low
	Control	30	3.13	1.33	Low
Post-test	Experimental	36	12.36	1.90	High
	Control	30	2.79	0.98	Low

N = 65.  $\bar{X} \leq 4$  = Very low, 5.0–8.0 = low, 9.0–16.0 = high,  $\bar{X}$ value 17.0–20.0 = very high.

### Students' ability to organize coherent writing before and after concept mapping strategy

Students in the experimental and control groups have a very low level of ability to organize coherent paragraphs before exposure to concept mapping ( $M = 3.39$ ,  $SD = 1.47$  and  $3.13$ ,  $SD = 1.33$ , respectively). In the post-test scores, the experimental group had a mean score of 12.36 and an SD of 1.98, whereas those in the control group had a mean score of 2.79 and an SD of 0.98 (see **Table 1**). It signifies that the concept mapping strategy succeeded in improving students' ability to organize coherent paragraphs in composition writing.

### Students' ability to edit composition writing before and after concept mapping strategy

**Table 2** presents the result of question three and shows that both students assigned to the experimental and control groups had low pre-test mean scores ( $M = 2.72$  and  $M = 2.77$ , respectively). The variability of scores (SD) in the experimental group was 1.16, while that of the control group was 1.17, respectively. More so, students in the experimental group earned a high post-test mean score of 8.19 with an SD of 1.34, while the students in the control group had a mean score of 2.48 with an SD of 0.63. It means that the concept mapping strategy assisted in enhancing students' ability to edit composition writing.

### Effects of concept mapping on students' ability to construct cohesive sentence with pre-test as covariance

**Table 3** shows the hypothesis one result. Outcomes revealed that the  $p$ -value = 0.000 is less at 95% confidence interval ( $p < 0.05$ ). Consequently, the experimental group with post-test mean and SD as 12.64 and 2.09, respectively, is significantly different from that of control groups ( $M = 8.59$ ,  $SD = 2.35$ ) on

**TABLE 2** Level of students' ability to edit composition before and after exposure to treatment.

Test	Group	N	$\bar{X}$	SD	Remark
Pre-test	Experimental	36	2.72	1.16	Low
	Control	30	2.77	1.17	Low
Post-test	Experimental	36	8.19	1.34	High
	Control	30	2.48	0.63	Low

N = 66.  $\bar{X}$ score 0–2.90 = Very low, 3.0–4.0 = low, 5.0–6.0 = average, 7.0–8.0 = high, and then 9.0–10.0 = very high.

TABLE 3 Analysis of covariance (ANCOVA) result on students' ability to construct cohesive sentence for composition writing after exposure to concept mapping instruction.

Source	Type III sum of squares	df	Mean Square	F	p	Effect size
Corrected model	304.210 <sup>a</sup>	2	152.11	35.33	0.000	0.533
Intercept	573.038	1	573.04	133.10	0.000	0.682
Pre-test	40.411	1	40.41	9.39	0.011	0.131
Group post-test (experimental and control)	301.882	1	301.88	70.12	0.000	0.531
Error	266.929	62	4.31			
Total	8,196.000	65				
Corrected total	571.138	64				

$N = 66$ .  $P < 0.05$ .  $R^2 = 0.533$  (Adjusted  $R^2 = 0.518$ ). "a" stand for Ancova value.

post-test ability to construct cohesive sentence after holding the effect of pre-test constant,  $F(1, 62) = 70.12$ ,  $p < 0.05$ . Concept mapping instruction accounted for 53.3% variance in students' ability to construct a cohesive sentence with moderate effect size ( $\eta^2 = 0.531$ ). It means that the concept mapping strategy significantly increased students' ability to construct a cohesive sentence in composition writing.

### Effects of concept mapping on students' ability to write coherent paragraph with pre-test as covariance

Hypothesis two result is shown in [Table 4](#). In the result, experimental group post-test mean score ( $M = 12.36$ ,  $SD = 1.90$ ) of the ability to write coherent paragraph significantly differ from their control group ( $M = 2.79$ ,  $SD = 0.99$ ) counterpart,  $F(1, 62) = 597.12$ ,  $p < 0.05$ . Concept mapping instruction accounted for a 90.7% change in students' ability to write a coherent paragraph ( $\eta^2 = 0.906$ ). This implies that the concept mapping strategy significantly enhanced students' ability to write a coherent paragraph in composition writing.

### Effects of concept mapping on students' ability to edit composition writing with pre-test as covariance

Hypothesis three result is presented in [Table 5](#). Therefore, the experimental group post-test mean score ( $M = 8.19$ ,  $SD = 1.35$ ) on ability to edit composition writing significantly differ from that of the control group counterpart ( $M = 2.19$ ,  $SD = 0.63$ ), after controlling for the effect of pre-test score  $F(1, 62) = 597.12$ ,  $p < 0.05$ . Concept mapping instruction was responsible for 88.6% variance in students' ability to edit composition with a very large effect size ( $\eta^2 = 0.906$ ). It means that concept mapping instruction significantly improved students' ability to edit composition writing.

## Discussion

This study investigated the effects of concept mapping strategy on sentence construction, paragraphing, and editing in composition writing achievement of Junior School students in Kafanchan Education Zone of Kaduna State Nigeria. Students' ability to construct cohesive sentences was found to be very low at the start of the study, but it improved when they were taught using concept mapping. After correcting for the pre-test effect, students in the experimental group had considerably better post-test ability to form cohesive sentences than those in the control group. High ability of students in composition writing achievement was achieved because students who received concept mapping instructions learned to construct cohesive sentences in succession. The students' low ability to construct cohesive sentences can be linked to a lack of teaching in concept mapping. This finding is supported by that of [Muhammad \(2016\)](#) who noted that concept mapping helped students how to map out relevant words and punctuations for meaningful presentation of information in class. Other researches by [Jafari and Zarei \(2015\)](#) and [Russel \(2016\)](#) also confirm this finding as their research results indicated that concept mapping improved students' argumentative essays and written appreciation of prose literature, respectively.

Furthermore, the study revealed that students' ability to organize cohesive paragraphs before instruction in concept mapping instruction was limited. The experimental group's post-test mean score on the ability to compose cohesive paragraphs was found to be significantly different from the control group. This was conceivable because students had previously received insufficient instruction in composition writing abilities, including the use of acceptable strategies such as concept mapping. Students who were taught concept mapping learned several ways of ordering and changing words or phrases to communicate to the reader a change in idea, topic paragraph, or a shift from a broad to a narrow issue. This finding is supported by that of [Aziza \(2019\)](#) who also found out that concept mapping enabled students to learn that the paragraph consists of a series of sentences organized cohesively

**TABLE 4** Analysis of covariance (ANCOVA) result on students' ability to write coherent paragraph in composition writing after exposure to concept mapping instruction.

Source	Type III sum of squares	df	Mean square	F	p	Effect size
Corrected model	1,473.135 <sup>a</sup>	2	736.57	303.82	0.000	0.907
Intercept	510.193	1	510.19	210.44	0.000	0.772
Pre-test	2.753	1	2.75	1.14	0.291	0.018
Between group post-test (experimental and control)	1,447.652	1	1,447.65	597.12	0.000	0.906
Error	150.311	62	2.42			
Total	5,880.000	65				
Corrected total	1,623.446	64				

$N = 66$ .  $P < 0.05$ .  $R^2 = 0.907$  (Adjusted  $R^2 = 0.904$ ). "a" stand for Ancova value.

**TABLE 5** Analysis of covariance (ANCOVA) result on students' ability to edit composition writing after exposure to concept mapping instruction.

Source	Type III sum of squares	df	Mean square	F	p	Effect size
Corrected model	1,473.135 <sup>a</sup>	2	736.57	303.82	0.000	0.907
Intercept	510.193	1	510.19	210.44	0.000	0.772
Pre-test	2.753	1	2.75	1.14	0.291	0.018
Between group post-test (experimental and control)	1,447.652	1	1,447.65	597.12	0.000	0.906
Error	150.311	62	2.42			
Total	5,880.000	65				
Corrected total	1,623.446	64				

$N = 66$ .  $P < 0.05$ .  $R^2 = 0.886$  (Adjusted  $R^2 = 0.882$ ). "a" stand for Ancova value.

and related to a single idea in a paragraph and paragraphs organized coherently in a broad topic which helped them to write good paragraphs in their essays. In corroboration with the new finding, [Owolabi and Adaramati \(2015\)](#) and [Zarei and Feizollahi \(2018\)](#) in their studies, also established that concept mapping is effective in brainstorming for composition writing accuracy and writing of coherent paragraphs.

Another finding suggested that the level of junior secondary school students' ability to edit composition writing before concept mapping instruction was very low. The experimental group's post-test mean score on the ability to edit composition writing significantly differed from that of the control group counterpart after the effect of the pre-test was controlled. The low students' ability to edit can be attributed to the inability to receive instruction in concept mapping in the writing process. The level of ability to edit their compositions later, highly improved after exposure to concept mapping instruction. The study of [Anyebe \(2017\)](#) provided that concept mapping in the writing process helps students in improving their composition writing by correcting errors in words, sentences, or even paragraphs. [Oyedele and Chikwature \(2019\)](#) also discovered that it enabled writers, to communicate information effectively. The research of [Muhammad \(2016\)](#), buttressed that significant development in students' achievement in sentence organization, editing content, style, and quality expression in essay writing skills after teaching with concept mapping strategy was recorded. In another study, [Muhammad \(2016\)](#) equally found an improvement in the descriptive and narrative writing

ability of students in the classes taught with concept mapping and mind mapping.

## Conclusion/implications

In composition writing, the importance of sentence construction, paragraphing, and editing is often undervalued. As a result, effective strategies such as concept mapping are required to improve such. According to the findings of this study, concept mapping is a very effective approach for improving students' sentence structure, paragraphing, and editing skills in composition writing. Students who are taught or use concept mapping in composition writing classrooms will be more proficient in cohesive sentence structure, coherent paragraphing, and quality editing as they can use the strategy both in and out of classroom settings. Secondly, as teachers and students develop confidence in the use of concept mapping in composition writing, the skills or strategy could be transferred to writing in other subject areas in the curriculum.

## Limitations

In Nigeria, we discovered that composition writing achievement is gender-dependent. Our research looked at composition writing irrespective of gender. Researchers can look into this further in the future to see whether there are



any gender differences in composition writing success. Again, the current study does not take into account Nigeria's different socio-cultural perspectives. The majority of the students evaluated speak English as a second language, which has an impact on the bulk of their English expression. The socio-cultural aspects, on the other hand, must be investigated in subsequent investigations.

## Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

## Ethics statement

Written informed consent for participation was issued to the students, parents, school authorities, and Kaduna State Ministry of Education. The study was allowed to proceed after the informed-consent letters were signed based on agreement by the concerned individuals or institutions.

## Author contributions

RG set up the framework, revised the manuscript, and developed the instrument. HY searched the literature and wrote the draft of literature as well as collected the data for the study. Both authors supported the data analysis through

funding, as well as contributed to the article, and approved the submitted version.

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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## References

- Abdalla, L. (2021). *How To write conclusion for an essay*. Available online at: <https://www.bestcolleges.com/blog/how-to-write-a-conclusion/> (accessed Aug 26, 2022).
- Anyebe, M. O. (2017). Effects of the process approach on senior secondary school students' achievement in composition writing in Bassa Local Government Area of Plateau state Nigeria. Ph.D. Thesis. Jos: University of Jos.
- Aziza, R. D. (2019). Modified video and mind mapping in teaching writing. *U. JET* 8, 34–44.
- Baird, L., and Wilkerson, G. (2021). *What is composition writing?*
- Bitrus, C. K. (2015). *Effects of workshop method of teaching writing on composing skills of junior secondary schools in Sabon Tasha Zone of Kaduna State*. Unpublished thesis. Jos: University of Jos.
- Bukhari, S. S. F. (2016). Mind mapping techniques to enhance EFL writing skill. *Int. J. Linguist. Commun.* 4, 58–77. doi: 10.15640/ijlc.v4.n1a7
- Canas, A. J., and Novak, J. D. (2008). "Effects of concept mapping on second language learners' comprehension of informative text," in *Proceedings of the second conference on concept mapping*, Costa Rica.
- Cohen, I., Manion, L., and Morrison, K. (2007). *Research methods in education*, 6th Edn. London: Taylor & Francis Group, 133–164. doi: 10.4324/9780203029053
- Echoga, B. O. (2018). *Effect of conference method on the performance of senior secondary schools' student written composition in Jos North Local Government Area of Plateau State, Nigeria*. Unpublished Doctoral thesis. Jos: University of Jos.
- Galti, A. M., Saidu, S., Yusuf, H., and Goni, A. A. (2018). *Rating scale in writing assessment: Holistic vs analytical scales*. Available online at: [https://www.researchgate.net/publication/328676063\\_Rating\\_scale\\_in\\_writing\\_assessment\\_Holistic\\_vs\\_Analytical\\_scales\\_A\\_review](https://www.researchgate.net/publication/328676063_Rating_scale_in_writing_assessment_Holistic_vs_Analytical_scales_A_review) (accessed September 22, 2022).
- Holschuh, J. P., and Nist, S. L. (2000). *Active learning: Strategies for college success*. Boston, MA: Allyn & Bacon.
- Jafari, N., and Zarei, G. R. (2015). The influence of concept mapping on Iranian intermediate efl learners argumentative essay writing skill. *J. Appl. Linguist. Lang. Res.* 2, 98–112.
- Jimenez, L. (2017). *The importance of sentence structure*. Available online at: <https://prezi.com/vhuglxcoiava/the-importance-of-sentence-structure/> (accessed August 25, 2022).
- Kafanchan Education Zone (2021). *Statistics of junior secondary school students*. Kafanchan: Kafanchan Education Zone.
- Karpicke, J. D. (2018). "Concept mapping," in *The SAGE encyclopedia of educational research, measurement, and evaluation*, ed. B. Frey (Thousand Oaks, CA: SAGE Publishing, Inc), 351–354.
- Khoshshima, H., Saed, A., and Hakimzade, A. (2016). Effectiveness of concept mapping strategy on EFL learners' attitude and gender difference outcomes in vocabulary acquisition. *Int. J. Humanit. Cult. Stud.* 3, 23–45.
- Macaro, E. (2001). Analysing students' teachers codeswitching in foreign language classrooms: Theories and decision

- making. *Mod. Lang. J.* 85, 531–548. doi: 10.1111/0026-7902.00124
- Maibodi, A. H. (2017). *The impact of mind mapping strategy on vocabulary use in writing of Iranian EFL learners*. Available online at: [https://www.researchgate.net/publication/318583734\\_The\\_Impact\\_of\\_Mind\\_Mapping\\_Strategy\\_on\\_Vocabulary\\_Use\\_in\\_the\\_Writing\\_of\\_Iranian\\_EFL\\_Learners](https://www.researchgate.net/publication/318583734_The_Impact_of_Mind_Mapping_Strategy_on_Vocabulary_Use_in_the_Writing_of_Iranian_EFL_Learners) (accessed September 22, 2022).
- Mohammed, I. S. (2021). Suggested strategies for writing narrative essay. *Int. J. Linguistics Lit. Transl.* 4, 30–39.
- Muhammad, N. M. (2016). *The effects of using concept mapping as a pre-writing stage strategy on Iraqi FL college students' achievement in essay writing*. Available online at: <https://www.iasj.net/iasj/pdf/48bd415dbdc418e1> (accessed April 27, 2022).
- National Examination Council (2018). *National examination council report*. Minna: National Examination Council.
- National Policy on Education (2014). *Nigerian Educational Research and Development (NERDC)*, 6th Edn. Yaba: NERDC Press.
- Okeke, O. J. (2010). *Effect of mind mapping teaching strategy on students interest, retention and achievement in senior secondary school chemistry*. Ph. D. Thesis. Nsukka: University of Nigeria.
- Owolabi, J., and Adaramati, J. F. (2015). Effects of graphic organisers on students' achievement in word problems. *J. Educ. Pract.* 6, 222–288.
- Oyedele, V., and Chikwature, W. (2016). English composition writing skills at ordinary level and its effects on students performance in three day Secondary School in Matari District, Manicaland. *European Journal of English Language. Linguist. Lit.* 3, 60–74.
- Paudel, P., Campus, P. N., and Nepal, P. (2019). *Editing as a craft in academic writing*.
- Razeq, A. A., and Abualhommos, G. (2019). Using concept maps in teaching writing in the L2 classroom. *Dirasat Educ. Sci.* 46(Suppl. 1), 273–285.
- Russel, J. (2016). *Improving your writing by using concept maps*. Available online at: <https://learningenglish.voanews.com/a/improve-your-writing-using-concept-maps3486794.html> (accessed September 22, 2022).
- Shakoori, M., Kadivar, P., and Sarami, R. (2017). The effects of concept mapping strategy as a graphical tool in writing among EFL learners. *Int. J. Inf. Educ. Technol.* 7, 455–469. doi: 10.18178/ijiet.2017.7.5.894
- Silva, T. (2003). *Second language composition*. London: Longman.
- Talinn, E. (2016). "Concept maps and language acquisition: An implementation with English Language level 2 students," in *Proceedings of the Seventh International Conference on Concept Mapping* in Curitiba, Brazil.
- Trang, P. T. (2017). Effects of concept mapping on EFL students reading comprehension. *Eur. J. Engl. Lang. Teach.* 2, 45–64.
- Trapman, M., Gelderen, A. V., Schooten, E. A., and Hulstijn, J. (2018). Writing proficiency level and writing development of low-achieving adolescents: The roles of linguistic knowledge, fluency and Metacognitive knowledge. *Read. Writ.* 31, 893–926. doi: 10.1007/s11145-018-9818-9
- Treasure, S. G. (2022). *English composition & essay writing workbook for high schools & colleges, a guide to writing better & improved compositions and essays*. Seattle, WA: Amazon Kindle Direct Publishing.
- Zarei, A. A., and Feizollahi, B. (2018). Concept mapping and brainstorming affecting writing anxiety and accuracy. *J. Mod. Res. Engl. Lang. Stud.* 5, 117–144.