



Effects of concept Mapping Strategy on senior secondary two students on Essay Writing performance in Southern Kaduna State, Nigeria

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Abstract

Many Nigerian students have discovered essay writing to be a daunting task. Limited studies have explored effective strategies for improving students' essay writing performance. The present study, however, investigated the effects of concept mapping as an essay writing strategy on essay writing performance of senior secondary school students in the southern senatorial Zone of Kaduna State. The study was guided by research questions and hypotheses. Quasi-experimental (non-equivalent pre-test-post-test control group) research design was employed for the study. A sample of 85 (experimental group = 49, control group = 36) Senior Secondary School two (SSII) students from two (2) of the 109 public senior secondary schools in the Southern Senatorial Zone of Kaduna State participated in the study. Students in the experimental group received 8-weeks (80 minutes of double lessons) training on concept mapping instruction, while those in the control group were exposed to normal conventional teaching. The data was obtained on essay writing performance of students before and after the intervention programme using Composition Writing Achievement Test (CWAT, test-retest reliability = .78) developed by the researcher. Data obtained from the participants were analysed using the descriptive statistics (means & standard deviation) to measure the level of composition writing skills (idea generation and outlining). Also, t-test for independent sample was used to test significant difference in students' pre and post-test essay writing performance between the two groups. Results indicated that students have very low essay writing performance at baseline, and subsequently improves after exposure to concept mapping instruction. More so, concept mapping instruction improves students' ability to generate and outline ideas in composition writing. The study concluded that concept mapping instruction has significant effects on essay writing skills of secondary school students. The implications of the findings to teachers, students, and other relevant stakeholders have been discussed.

Keywords: Composition writing, Idea generation, Outlining, Composition writing performance and Secondary school students.

Introduction

Writing is a fundamental tool for advancing personal and professional potentials. It is an important skill that can benefit individuals in different aspects of lives. The fundamental role writing plays in the academic setting is critical because it can effectively deliver acquired knowledge in different fields. Writing empowers students to express their critical thoughts, collaborate, and participate in other accomplishments. Available literature shows that writing is a productive skill with a series of activities and several stages: the introductory stage, the content development, revision, and publishing stage (Miftah 2015)^[16]. A writer uses words to build sentences, sentences to make paragraphs, and paragraphs to compose an essay, article, or letter. In education, writing is the actual basis used to test learning and check intelligence levels in schools and in the workplace (Bitrus 2015)^[3].

The performance of learners in most academic settings, however, is largely dependent on their ability to develop a satisfactory level of proficiency in writing (Trapman, Gelderen, Schooten & Hulstijn, 2018)^[27]. Thus, the ability to convey ideas facts and information in a logical and coherent manner has a bearing on learners' performance. The writing achievement of students in Nigeria is always referenced through scores from their writing tasks which include tests, assignments and national examinations like the Senior Secondary Certificate Examination (SSCE) in Nigeria.

In spite the prominence of writing in the global society and in the school curriculum, the performance of students in the English Language, especially the essay writing aspect at the secondary school level has been poor. The WAEC Chief Examiners' Report of 2023 and 2024, that students' essays were sketchy and unorganized, indicating very low mastery of content. This resulted from students' inability to generate ideas and outline them to create complete essays. The reports also stated that students' compositions revealed that there had been no adequate exposure of students to some basic writing skills through the appropriate pre-writing strategies. Baseline data have revealed that writing in English as a second language is a difficult task for students and many teachers teach writing as a product without providing pre-writing activities to teach writing as a process (Al-Shaer, 2014; Gowon & Yashim, 2022)^[9]. The students lack the proficiency to communicate effectively when writing in the English Language. Most of the students have difficulties generating and outlining ideas for meaningful writing that affects their performance in other subjects. Not using the appropriate pre-writing activities make students see writing lessons as frustrating and boring leading to continuous poor performance in English and other school subjects (Sa'ad, & Usman, 2014)^[23].

Essay writing is perceived to be one of the writing constituents that involves processes of setting together words in a correct way either to discuss a thing, situation, a person, or just a topic in a way that communicates the writer's understanding creatively in form of opinion,

solution or recommendations (Oyedele & Chikwature, 2016) ^[21]. In effective essay writing, idea generation and outlining ideas are vital. Idea generation is an imaginative process of producing, developing, and communicating new ideas verbally or in writing (Muhammad, 2015) ^[17]. An idea can be understood as a basic element that can be abstract, visual, or concrete. The concept mapping and graphic organizer are idea generation strategies that have been used by early thinkers and philosophers for centuries (Saleh & Ismail 2013). It starts with a central idea and branches out onto different new ideas that can further branch out aggressively to more ideas. Idea generation enhances students' cortical skills including generating concepts, analysing or connecting numbers in addition to applying logic in both analytical and abstract ways.

In Nigeria, a guide on how a descriptive essay can be taught using concept map structures among secondary students has been examined (Udu, 2013; Bitrus 2018 & Echoga, 2018) ^[29, 6]. Also, the significant effects of the workshop method of teaching writing on the essay writing skills of senior secondary students in the Sabon Tasha Zone of Kaduna State were observed (Bitrus, 2015) ^[3]. Furthermore, a significant effect of graphic organizers (which is similar to concept mapping strategy) on students' academic performance in English word problems and appreciation of English prose literature has been reported (Owolabi & Adaramati, 2015; Ubu, Oteikwo, Onwuka & Abiodun-Eniayekan, 2017) ^[20]. Echoga, (2018) ^[6] studied the effects of the conference method on the performance of senior secondary school students' written essays in Plateau State, Nigeria, and found out that the method significantly improved students' written essays. From the reviewed studies, it is obvious that no study targeted at strategies that improve idea generation and outlined ideas in written essays among senior secondary school students in Nigeria, particularly, concept mapping. Thus, the need for this study.

1. Theoretical Framework

This study is hinged on Piaget's Construction Learning Theory. Piaget (1971) ^[22] developed the theory which focused on cognitive development and learning theories. The theory explains the nature of knowledge and human learning that supports the principles of collaboration, interaction, and active learning to retain meaning. It continues that real understanding is only constructed based on the learner's previous experience or background knowledge. The theory sees the teacher as facilitator and not just a dispenser of knowledge. Learning is student-centered through effective collaborative coordination to produce critical thinkers. However, the use of concept mapping as a pre-writing activity for learning is based on cognitive learning-student's cognitive abilities which enables learners to construct their meaning of given concepts through teamwork at the pre-writing stage. Thus, when concept mapping as a pre-writing strategy is presented to students before the actual writing task, their ability to generate and outline ideas may expressively improve. Therefore, improving essay writing skills requires the practical presentation of strategies like concept mapping instructions from the pre-writing stage, to the writing stage.

2. Aim and objectives of the study

This study aims to ascertain the effects of concept mapping strategy on the essay writing performance of SSII students in the Southern Senatorial Zone of Kaduna State. The specific objectives of this study were to:

1. Determine the levels of essay writing performance of students at the baseline prior exposure to instruction in concept mapping as a pre-writing strategy.
2. Ascertain the levels of idea generation achievement of students after exposure to instruction in concept mapping as a pre-writing strategy.
3. Ascertain the ability of students to outline ideas after exposure to instruction in concept mapping as a pre-writing strategy.
4. Examine the effectiveness of instruction in concept mapping as a pre-writing strategy on the students' ability to generate ideas in essay writing.
5. Ascertain the effectiveness of instruction in concept mapping as a pre-writing strategy on the students' outlining of ideas in essay writing.

Method and Procedure

1. Research Design

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

1.1 Participants

The population for this study comprised of all the Senior Secondary School two (SS 2) students in the 109 public senior secondary schools in Southern Senatorial Zone of Kaduna State. Simple random sampling technique was used to sample 85 students from two schools. There were 49 students in school 'A' and 36 in school 'B'. These schools shared similar attributes in terms of school ownership, management, teachers' qualification, and students' performance level in the English language. The population (male and female) constituted the sample size of the study because intact classes were used. Thus, school 'A' with the intact class of 49 formed the experimental group, while the intact class in school 'B' with 36, constituted the control group.

1.2 Research Instrument

The study used the Composition Writing Achievement Test (CWAT) to obtain data from the participants. The instrument was developed according to the senior School Certificate Examination standard developed by the West African Examination Council (WAEC). The instrument was meant to test some specific writing skills which included idea generation and outlining. The CWAT had two parts, part one consisted of students' demographic data such as gender and age, while part two was made up of essay which was analytical. In the analytic part, scripts were rated on aspects of writing such as content, grammatical accuracy,

use of tenses, spelling, text organization (coherence and cohesion) punctuation, paragraphing, with more emphasis on content and organization which has more to do with idea generation and outlining (Galti, Saidu, Yusuf & Goni, 2018) [8]. Scores obtained were categorized as very low, low, high, and very high. The CWAT was subjected to validation. This was carried out by two professionals in the English Education Unit of Arts Education and one expert in the Research, Test, and Measurement Unit all in the University of Jos. The test-retest reliability was established for the instrument and the result yielded a 0.78 stability coefficient.

1.3 Experimental Procedure

Four research assistants were trained for three days where they assisted throughout the study. The experimental group was managed by the researcher. Participants in the experimental group were exposed to training on concept mapping as a pre-writing strategy. The training enabled them to go through the process approach of writing skills in idea generation and outlining the ideas. The training schedule captured the curriculum relating to the writing process which included the following stages: pre-writing, writing, editing, and re-writing. The training lasted over eight (8) weeks including the training of the research assistants. The treatment was conducted during the school hours using the normal two double periods (40 minutes each), totaling 80 minutes a week, of the English Language school timetable for the intact classes. Before and after the intervention, participants were given CWAT to respond to or write upon. At the same time, the control group was managed by the research assistants. The participants were exposed to conventional teaching while concept mapping as a pre-writing 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 minutes each), totaling 80 minutes a week, of the English Language school timetable for the intact classes. CWAT was issued to them where they responded before and after the control group placebo administration.

1.4 Procedure

The researcher initially contacted the school principals and presented an introductory letter from the School of Secondary Education: Languages Programmes, Kaduna State College of Education, Gidan Waya. The letter was to seek the consent of the various school heads, gain approval, and request to use part of their school resources and students for the research. Thereafter, the researcher gave a consent letter to the students to fill and sign for ethical consideration. The approval was obtained before embarking on the study. Initial data was obtained using CWAT before intervention. Equally, a post-test was obtained using a direct method of administration after the intervention programme. Students were guided and directed to respond the instrument independently on reading the instructions. They were instructed to respond to the questions within 40 minutes and return directly to either the researcher or research assistants. After the post-test, the researcher appreciated the time and

efforts of the participants and research assistants. Participants were made aware that their responses would be treated with a serious sense of confidentiality.

2. Data Analysis

Data obtained from the respondents were analyzed using descriptive statistics (means & standard deviation) to measure the level of composition writing skills (idea generation and outlining) before and after the intervention. Also, a t-test for the independent sample was used to test the hypotheses at the 0.05 level of significance. This tool tested the significant difference in the mean scores in composition writing between the experimental and control groups on baseline information and after exposure to the concept mapping as a pre-writing strategy. Mean comparison permitted the researchers to establish the effects of concept mapping instruction on composition writing.

Results

Results are presented according to the research questions and hypotheses

Table 1: Extent of Essay Writing Performance of the SS II Students before Concept Mapping Instruction

Group	N	\bar{x}	SD	Remark
Experimental	49	40.34	3.23	Low
Control	36	39.14	3.32	Very Low

Note: N=85. $\bar{x} \leq 39.0$ = Very low, 40.0 - 49.0 = Low, 50.0 – 69.0 = High, $\bar{x} \geq 70.0$ = Very High.

Table 1 presented the pre-test essay writing performance of students. The result revealed that students’ pre-test essay writing achievement mean scores of the experimental (\bar{x} = 40.34, SD = 3.23) was low while that of the control group was very low (\bar{x} = 39.14, SD = 3.32). This implies that junior secondary school students at baseline had low level of essay writing performance before exposure to concept mapping instruction.

Table 2: t-test Analysis on Post-Test Essay Writing Performance Scores of Students in the Experimental and Control Groups

Group	N	\bar{x}	SD	df	t	p	Decision
Experimental	49	66.15	2.67				
				63	46.83	.000	Rejected
Control	36	38.94	2.63				

Note: N = 85. P < .05

Table 2 indicated that the experimental group had high post-test performance in essay writing. The performance mean score (\bar{x} =66.15, SD = 2.67) compared to the control group (\bar{x} = 38.94, SD = 2.63). With p = 0.000 which is less than 0.05 level of significance, the null hypothesis is rejected and ruled that there was significant difference between post-test writing performance of students in the experimental and control group, (63) = 46.83, p < 0.05. This showed that concept mapping instruction had significant effect on essay writing performance score of SS students.

Table 3: Extent of Students’ Ability to Generate Ideas for Essay Writing After Exposure to Concept Mapping Instruction

Group	N	\bar{x}	SD	Remark
Experimental	49	21.82	2.52	Very High
Control	36	9.31	1.76	Low

Note: $N=85$. $\bar{x} \leq 5$ = Very low, 6.0 – 10.0 = Low, 11.0 – 15.0 = Average, 16.0 – 20.0 = High, \bar{x} value 21.0-25.0 = Very High
 Data in Table 3 displayed the post-test ability to generate ideas for essay writing among students. The result indicated that the mean scores of the experimental group ($\bar{x} = 21.82$, $SD = 2.52$) was very high while that of the control group was low ($\bar{x} = 9.31$, $SD = 1.76$). This signifies that the extent of junior secondary school students' ability to generate ideas for essay writing was very high after exposing the experimental group to concept mapping instruction.

Table 4: t-test Analysis on Post-Test Ability to Generate Ideas Mean Score between the Experimental and Control Groups

Group	N	\bar{x}	SD	df	t	p	Decision
Experimental	49	21.82	2.52				
				63	42.80	.000	Rejected
Control	36	9.31	1.76				

Note: $N = 85$. $P < .05$

Table 4 reported that the experimental group had post-test ability to generate ideas higher ($\bar{x} = 21.82$, $SD = 2.52$) than that of the control group ($\bar{x} = 9.31$, $SD = 1.76$). The $p = 0.000$ is less than the 0.05 level of significance, hence the null hypothesis is rejected and concluded that there was significant difference in post-test ability to generate ideas between the experimental and control group, $(63) = 42.80$, $p < 0.05$. This implies that concept mapping instruction has significant effect on students' ability to generate ideas in essay writing.

Table 5: Extent of Students' Ability to Outline Ideas for Essay Writing After Exposure to Concept Mapping Instruction

Group	N	\bar{x}	SD	Remark
Experimental	49	18.34	2.42	High
Control	36	9.16	1.79	Low

Note: $N=85$. $\bar{x} \leq 5$ = Very low, 6.0 – 10.0 = Low, 11.0 – 15.0 = Average, 16.0 – 20.0 = High, \bar{x} value 21.0-25.0 = Very High.

Table 5 reported the post-test ability to outline ideas for essay writing among SS students. Results revealed that the experimental group had high post-test mean score ($\bar{x} = 18.34$, $SD = 2.42$), while that of the control group ($\bar{x} = 9.16$, $SD = 1.79$) was low. Consequently, the extent of senior secondary school students' ability to outline ideas for essay writing was high after teaching the experimental group with concept mapping instruction.

Table 6: t-test Analysis on Post-Test Ability to Outline Ideas Mean Score between the Experimental and Control Groups

Group	N	\bar{x}	SD	df	t	p	Decision
Experimental	49	21.82	2.52				
				63	20.50	.000	Rejected
Control	36	9.31	1.76				

Note: $N = 85$.

Table 6 showed that the p -value = .000 is less than the 0.05 level of significance. Consequently, the null hypothesis is rejected and decided that there is a significant difference between the experimental ($\bar{x} = 21.82$, $SD = 2.52$) and the control groups ($\bar{x} = 9.31$, $SD = 1.76$) on post-test ability to outline ideas, $t(63) = 20.50$, $p < 0.05$. This implies that concept mapping had a significant effect on students' ability to outline ideas in essay writing.

Discussion

This study investigated the effects of concept mapping as a pre-writing strategy on the composition writing achievement of JSII students in Southern Senatorial Zone of Kaduna State, Nigeria. The result of the baseline information revealed that students in the study area have a very low level of composition writing ability before exposure to concept mapping instruction. The students' composition writing ability, that is, the ability to understand the relationships between concepts and hence understand those concepts themselves and the domain to which they belong (Trang, 2017)^[26] was highly sub-optimal. This may be attributed to the initial withholding of concept mapping training and lack of proper instruction on concept mapping because the effect of concept mapping to enhance text comprehension and summarization needs no accent. This finding tends to have coincided with the previous study's position that concept mapping improves writing essay and summarization (Zarei & Feizollahi, 2018)^[30]. It implies that poor encoding of instruction on concept mapping can lead to very low performance in essay writing skills.

Another finding indicated that the level of students' ability to outline ideas for essay writing improved after exposure to concept mapping instruction. Students who are exposed to concept mapping are placed at the advantage of being able to itemize relevant ideas and establish relational links between relevant concepts. Through concept mapping, students find meaningful learning by linking new concepts to existing knowledge (Maidobi, 2017). The present result therefore corroborates with Marashi and Kangani (2018)^[15] who found that concept mapping enabled the elements of learning to generate and relate to how cognitive knowledge is developed structurally by the learner.

Furthermore, a significant difference was observed between the experimental and control groups on post-test essay writing achievement scores. In other words, concept mapping instruction has a positive effect on essay writing performance scores. This is highly possible because students randomly assigned to the experimental group were equipped with skills to enhance text essay, comprehension, and summarization.

There is a significant difference in post-test ability to outline ideas between the students who are exposed to concept mapping instruction and those who are not. This portrays the efficacy of concept mapping instruction on students' ability to outline ideas in essay writing. This is highly likely because the instruction helps learners learn, create new knowledge, better idea structure and coherent organization of ideas (Aziza, 2019)^[2], as well as itemizing and evaluating ideas in essay writing.

Conclusion

Based on the findings of this study, it is concluded that concept mapping is a very effective pre-writing strategy that can be used for the improvement of student's essay writing in the following ways: The use of concept mapping, which is a graphical representation, helped student's reflections during their writing exercise. The use of concept mapping as a pre-writing activity helped the students to generate ideas and concentrate on their writing without going off-point. Thus, it supported students to sustain memories at the writing stage, and to outline and organize their essay chronologically, making ideas flow into others more meaningfully.

Due to the nature of concept mapping which encourages teamwork in the writing process, students were able to collaborate effectively as they easily communicated with their mates to come up with ideas on the topic. However, the findings of the study established significant implications to education stakeholders: students, teachers, school supervisors/inspectors, curriculum designers, textbooks authors, the Ministry of Education, and employers of labour.

Recommendations

The following recommendations are made based on the findings of the study:

1. Teachers of English should be encouraged to use concept mapping as a pre-writing strategy in the teaching of essay writing.
2. Students should be made to be aware of different strategies for pre-writing, including concept mapping, to improve their quality of writing.
3. Teachers should give special attention to the pre-writing stage of the writing process because of the great role it plays in writing good essays.
4. Workshops should be organized to train writing teachers on the use of concept mapping as a pre-writing strategy for teaching essay writing.

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