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Jeno-Mary Enighe

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Effects of graphic organisers on junior secondary school students' achievement in composition writing

Jeno-Mary Enighe

Department of Arts Education,
Faculty of Education,
University of Jos,
Plateau State, Nigeria
Email: jenomary@yahoo.com

Abstract: The study set out to investigate the effect of graphic organisers on junior secondary school students' achievement in composition writing in Jos East LGA, Plateau State. The study was guided by two research questions and two hypotheses. The sample of the study comprised 159 junior secondary students selected from two government secondary schools in Jos East LGA, Plateau State using a simple random sampling technique. The study adopted a quasi-experimental non-equivalent pre-test post-test research design. Two intact classes were assigned the experimental group and the other two, control group. Data were gathered using composition writing achievement test (CWAT) which was an instrument designed by the researchers. Mean and standard deviation were used to answer the research questions and analysis of covariance (ANCOVA) were used to test the hypotheses. Hypotheses tested revealed that students exposed to graphic organisers in composition writing exhibited higher achievement than those who were taught writing using the traditional methods. Based on the findings, it was recommended that teachers of English language should use graphic organisers in teaching writing and that more emphasis should be laid on other pre-writing activities that will develop students' writing skills, among other recommendations.

Keywords: composition writing; pre-writing activities; graphic organisers

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Biographical notes: Jeno-Mary Enighe is a Professor of English Education in the Department of Arts Education, Faculty of Education, University of Jos, Nigeria. She has a Master's degree in English for Specific Purposes and a PhD in Contrastive Analysis. Her areas of research interest include language studies, contrastive analysis, reading and writing achievement as well as communication and gender studies. Her other interests include speech writing and presentation, editing, proof reading and public speaking.

1 Introduction

With the shift of instructional paradigm from writing as a product to writing as a process, attention has been focused on the processes students go through to discover what to write

and how to organise their writing. The process approach to writing is the principle that writing is a process that uses some steps and skills which when applied in a recursive manner, leads students to a better understanding of the topic under construction. The shift of the instructional paradigm from writing as a product to writing as a process led to the discovery of what students do before the actual writing. This involves engaging in some activities that can enable the students to discover ideas, usually referred to as invention writing which ignites the students' thinking and creative abilities. Such activities are referred to as pre-writing activities. The focus of this study is on graphic organisers as an example of pre-writing activities.

Graphic organisers are useful tools in the pre-writing activity. They are tools or models used to help students organise their ideas in the writing process. They are also used to provoke the thinking ability of students while engaging in pre-writing activities. According to Dicecco and Gleason in Unzueta (2009), graphic organisers are used to display pictorial or graphic methods to organise information and thoughts that help the writer expand and explain a concept, and create clear and concise relationships. They can also be referred to as communication devices. As is often stated, the most popular and conventional learners' sensory performance is visual. Chang (2006) posits that people derive countless meanings and knowledge from what they see and from the ways they interact with the visual environment surrounding them. Examples of graphic organisers include mind map, concept map, spider map, series of event change, fish bone map, charts, story maps, cause and effect diagrams, time lines, webbing, flowcharts and vein diagrams (Mogahed, 2013).

The effectiveness of pre-writing activities can be seen in the work of Fagge (2017) where pre-writing activities enabled the students to discuss a topic, generate ideas and organise what to write. Through these activities, students were able to spend quality time which offered adequate attention to the content and organisation of their writing. They also discovered ideas through asking their peers, the whole class or the teacher target questions. Such interactions helped to generate new ideas, remember prior knowledge and develop the new ideas generated. Moreover, writing anxiety was reduced and the students wrote freely because they interacted with their peers. Also, Tayib (2015) noted that visual organisers provided the students with concrete framework of information, drew the learners' attention to major ideas, and established relationship between these ideas and the topic they discussed. It is based on this assertion that the present research work investigated the effects of graphic organisers on junior secondary school students' achievement in composition writing in Jos East Local Government Area of Plateau State.

2 Statement of the problem

There is a general outcry in Nigeria about the poor performance of both junior and senior secondary school students in English language particularly in composition writing. Composing meaningful and coherent composition is a problem to many junior secondary school students, especially so in Jos East Local Government Area of Plateau State. The reports of the Chief Examiner of Plateau State BECE (2016, 2017, 2018) revealed that students in Jos East hardly pass English language at a credit pass. The reports further revealed that students that passed English language at credit level were 35% out of 892 students in 2016; 37% out of 839 students 2017; and 52% out of 817 students 2018. The

observation in these reports indicated that many students presented composition that lack ideas and are not up to 250 words, being the minimum requirement for Basic Education Certificate Examination (BECE). The students were shown to not know how to express their ideas effectively. Their composition lacked proper sequence and organised flow of ideas and were not properly punctuated. The students' composition also lacked properly defined structure as many of the students do not know what to write about. In most cases, the students wrote down the title only while others wrote long and meaningless sentences. Also, many sentences were written without being punctuated.

The major factor responsible for the poor performance of students in composition writing was found to be teaching methodology. Most teachers use the traditional methods where the teachers provide students with a model copy of written composition and the students are expected to imitate the model copy to produce their own copies. This method does not allow the students to initiate their own ideas and styles. Also, the traditional methods do not allow the use of pre-writing activities like graphic organisers, that could ignite students' creativity. For an effective lesson delivery, students need to be exposed to teaching methods that can enable them to explore their ideas. This research set out therefore, to explore how graphic organisers can help junior secondary school students improve their composition writing abilities.

3 Conceptual review

The key concept in this study is graphic organisers. A graphic is a visual display that demonstrates relationships between ideas, facts and incidents. Graphic organisers are tools seen in the forms of graphs and charts used to represent ideas and information showing the sequence and relationship between the ideas and information. The focus here is often on process rather than product; and with the necessity of organising ideas coherently in composition writing, visual tools such as graphic organisers are recommended. Graphic organisers provide the learner with a different way of visualising and thinking about a topic; they enable students to raise and explore ideas, understand content, and improve their thinking skills and creativity. A graphic organiser is usually a one-page form with blank spaces left to be completed with ideas and information which are connected.

According to Chang (2006), graphic organisers can be applied as pre-teaching and post-teaching strategies for the purpose of introducing or reinforcing the key concept in a text. Miller (2011) sees these organisers as visual representations of ideas which help students to organise their thoughts and apply thinking skills to the content in a more organised and orderly way. They may often occur in the format of keywords and allow the students to focus on the meaning rather than the format of complete sentences. They can be open-ended, multi-layered, and differentiated. In addition, Corringan (2011), opines that graphic organisers are important due to their visual representation of ideas and how they help build schema and key concept and connection. These organisers are useful tools in planning composition writing as they are employed during pre-writing activities.

Mind mapping which is an example of a graphic organiser, is the graphical representation of the content of writing where ideas and concepts are represented in a graphic form. Buzan (2011) defines a mind map as a powerful graphic technique which provides a universal key to unlock the potentials of the brain. Here, word, image, number,

logic, rhythm, colour and spatial awareness are exploited to create unique images through infinite expanses of the brain. To Buzan (2011), mind map is usually applicable to every sphere of life where improved learning and clearer thinking could be productive. Mind mapping can therefore be applied in different subjects, courses or situations as expected and it is an evidence of human performance. Jameel and Mohamood (2017) consider mind mapping as a good pre-writing technique; and it is an effective method to write down notes and brainstorm composition themes because it includes writing down a central idea then supporting it with related ones. By concentrating on key ideas which are written in learner's own words, the learner can make a map in a way that leads to better understanding.

This strategy, as Meier (2007) posits, was founded by Tony Buzan, a psychologist and brain scientist. Its ideology is built on the fact that the two hemispheres of the human brain are responsible for different tasks. According to Buzan in Meier (2007), mind mapping was designed to use both sides of the brain to increase memory retention and productivity. At the onset, it was developed basically for note-taking and visual representation of information in an interesting format while considering other necessities required of writing. A notable benefit of this technique is that the open flowing format supports the natural thinking process.

Basksh et al. (2016, p.1) define mind map as "a visual form of note taking that offers an overview of a topic and its complete information, allowing students to comprehend, create new ideas and build connections." This is possible when students identify words and their order of importance. According to Madu and Metu (2012), in mind map, keywords are identified and arranged in their order of importance. These words can also be seen in the form of images. Main points are given preferential and superior places while supporting points occupy less important places. Mind map also enhances economy of words as only essential words, phrases and clauses are highlighted (Vijayavalsalan and Dhabi, 2016; Khudhair, 2016).

Concept mapping is another example of a graphic organiser. Concept mapping according to Mogahed (2013, p.68) is "a graphic organiser of activities that show the relationships among concepts. Usually the concepts are circled and the relationships are shown by connecting lines with short explanations." It identifies the various concepts associated with a topic and exposes how those concepts are related to one another. This could be achieved when the teacher brings out a topic and allows the students to identify the concepts connected to the topic then, the teacher gives an overview of the topic so as to enable the student suggest possible concepts in relation with the topic. The implication here is that concepts can be used for the sake of comparison and association.

Concept map is a graphic organiser that uses numerous concepts to illustrate a central idea. Lee (2013) sees concept mapping as a reflective process and emphasises the reasons and rationale of associations with related concepts. Maps generally are used to show hierarchical relationships with the main concepts placed at the top followed by others in their order of importance. Maps can also be used to brainstorm, activate background knowledge and generate synonyms and antonyms. According to Filgona et al. (2016), concept maps are forms of graphic organisers which help students to perceive the relationships between concepts through diagrammatic representation of concepts using key words associated with them. These maps help to facilitate logical thinking by provoking the students to remember concepts that can be used to illustrate a general idea.

The idea here is that learning is more productive when it is connected to prior knowledge with new information (Al-Shaer, 2014).

Spider map is another example of graphic organiser which focuses on the description of a central idea. Questions to be asked include: what is the central idea? What are its features? What are its functions? Another example of graphic organiser is series of event chain. Series of event chain gives a vivid description of the stages of something (the life cycle of a butterfly), or the sequence of events or formation of a state or nation. Key questions to be asked here include: what is the object procedure or initiating event? What are the steps or stages involved? How do they lead to one another? What is the result?

Fish bone map is also an example of a graphic organiser. Fish bone map is used to identify the casual interaction of a complex phenomenon. Some of the key questions to be asked here include: what are the factors that caused? How do they interrelate? Are there relationships between the factors that affect 'A' and the factors that affect 'B'? Chart is another example of graphic organiser. A chart is a diagram used to show directions of how to do something. It can also be used to categorise numerous ideas. Another example is story map. A story map is used to retell stories in books, plays and novels. Cause and effect diagrams are also examples of a graphic organiser. They are used to examine how things happened. In examining this, the cause and result are explained. Timelines are yet another example. Timelines are used to indicate how things occur in a time frame. Webbing is also on the list of graphic organisers. It is a visual picture that shows how words or phrases are connected to a topic or a concept. The teacher lists the target topic and builds a web-like structure of words and phrases that students generate as being connected to the topic.

Flowcharts are further examples of graphic organisers. They are used to enable students see the representation, role and other relationships among group elements. Here, the students draw a representation of a sequential flow of events, action, character, roles and decisions. Specifically, flowcharts foster logical and sequential cognitive development and direct students' attention to connections, relationships and interdependence of things and events. Vein diagrams are also examples of graphic organisers. These diagrams are used to visualise the analysis of information that show the differences and similarities among concepts, people and things. This organiser is constructed by using two or more overlapping geometrical figures such as circles, squares, rectangles that share an area in common.

4 Effects of pre-writing activities on students' composition writing

Pre-writing activities are important as they give students courage to face the writing task. Students' inability to generate relevant points in writing is a major problem identified by many teachers and examining bodies. Heshempour et al. (2015) are of the view that pre-writing activities enable writers not only to acquire the target language more efficiently but also to make useful thinking and planning that could be applied in other fields. This implies that these activities lay a solid foundation in the life of the learner. They could serve as a basis which the learners can use to solve other problems they will face in life. It is what the writer raises at this stage that will make other stages of the writing process to progress.

To Lee (2013), appropriate pre-writing activities enhance the writer's retrieval and application of knowledge. This is so because a process approach follows a step-by-step approach in writing. These steps enable learners to break their tasks into workable units where ideas could be viewed, explored, illustrated and examined. Writing calls for ability to put words on paper and ensure continuity in developing ideas and changing plans about ideas. The process of doing these will aid the writer to reduce tension and be focused as these activities could be used to overcome anxiety associated with the writing task. Servati (2012) agrees that writing causes a lot of anxiety for undergraduate and graduate students. A step-by-step approach is therefore suggested to address this problem. This is because anxiety levels differ from individual to individual and from situation to situation and could be handled when tasks are tackled gradually.

Another effect of pre-writing activities is their ability to promote cooperative learning and work. Writing is a complex skill interrelated with creativity which requires different forms of grammar, vocabulary, syntactic and rhetorical knowledge of the language. This opens room for interaction and cooperative discussions which make room for ideas to be criticised, accepted and evaluated. According to Rashtchi and Beiki (2015), cooperative pre-writing tasks provide deeper insights into the topics that the students plan to write and also evaluate the quality of writing (Storch in Rashtchi and Beiki, 2015). In cooperative work, individuals seek outcomes that are beneficial to everyone (Ofodu and Lawal, 2011; Biria and Karim, 2015). Lee (2013) maintains that the collaborative pre-writing task may prompt the writer to use new vocabularies to generate concepts, negotiate meanings of the concepts and their relationships based on the shared ideas among group members. Pre-writing activities enable all members of the group to feel like part of the team thereby encouraging participation and involvement as everybody's ideas and opinions are respected and valued. The goal of the group is to find a solution to a problem and there is a sense of commitment towards accomplishing this.

Pre-writing activities create a fun atmosphere in the classroom. These activities allow students' responses to be valued in a non-threatening set-up involved in response-based activities which are beneficial in building learners' confidence and skills. Mogahed (2013, p.60) argues that "the learner gathers information and plays with ideas during the pre-writing stage." Experiences and researches have shown that students learn very well under a relaxed atmosphere. Pre-writing activities create that relaxed atmosphere as the activities involved here are exciting and innovative. Servati (2012) adds that through pre-writing activities, students invest proper time that enable them to explore the use of the voice before writing and so develop the opinion that will form the basis of their writing. The experience of pre-writing is enjoyable and makes everyone a partaker of the exercise as no student is left out as they work together in the classroom. Mistakes are in this process identified and modified. Apart from engaging students in the various stages and activities of producing a good composition, the process itself is motivating as students feel free to contribute ideas as they work with their peers thereby making the exercise enjoyable. Such environment allows different tasks to be presented and students suggest how to solve problems on their own.

Another effect of pre-writing activities is their ability to expose the practical demonstration of language in use. Writing aims at creativity using words and styles as its special tools. In most creative writings, grammatical structure abounds in both regular and irregular patterns. In support of this, Othman and Mohammed (2011) assert that proficiency in writing reflects the learner's writing ability in the target language and

presents the content using linguistically well-formed structures. Stressing the importance of composition writing, Ahmed (2010) asserts that when students are properly taught the skills of composition writing, it will enable them to do away with memorisation, rote learning and plagiarism. He adds that competence in composition writing will enable students to succeed in other academic courses as expected. Al-Sawalha (2014) and Effendi et al. (2014) contend that in pre-writing activities, students develop functional language skills such as proper natural language in different social contexts and use language in creative ways. The authors added that many students are prone to memorising and imitation when they are not exposed to this functional language skill. In pre-writing activity students learn the language in meaningful interaction through oral, small group discussions, peer work and free responses. When various activities are utilised in writing classes, the learners exchange ideas and comments and work together to produce a good product. Through these activities, learners discover new ideas and new language forms to express these ideas which help to promote the development of language skills.

These activities could serve as rehearsal for the rest of the writing process (Akinwamide, 2012; Heshempour et al., 2015) because at this stage, this rehearsal or practice will direct the writer towards the goal of writing, thus making the writing to be focused. Ideas generated are sustained with illustrations. Murray in Al-Sawalha (2014) likens pre-writing activities to rehearsing for a writing task. Pre-writing is therefore a strong part of the writing process itself as the rest of the writing depends on the ideas raised at the beginning of the writing. Therefore, whatever is done at the other stages should be in line with the ideas identified in the pre-writing stage. As the writer develops the writing, he or she goes through this first stage as rehearsal and the points in this stage not only guide but direct the thinking and writing processes resulting in a coherent and well-developed writing. The examples, details, illustrations seen in the writing are decided in the ideas seen in the pre-writing stage.

Pre-writing activities accommodate students' individual needs to learn at their paces. As students learn at their own paces, using pre-writing activities to support and enhance writing skills will then reveal their strengths and weaknesses. Their strengths will be further strengthened and their weaknesses will be remedied. To Abedilegader and Salameh (2018), when pre-writing activities are associated with the use of multiple technologies in writing instructions, they will accommodate students with different learning styles, abilities and interests. Multiple technologies will also help students to practice different writing skills simultaneously. Abedilegader and Salameh go further to opine that web-based instruction has the advantage of combining several technologies such as e-mail, word-processing, online chat and websites that supply students with more information on some specific writing skills. The best way to use these activities is to know what the students need and what motivates them to improve their own abilities. Through pre-writing activities, students are taught what writing is; this helps struggling writers engage more fully in the writing process. The teacher can plan small group instruction targeting specific learning needs. These activities allow students to write at different paces; as such slower writers can take the time they need to complete their writing.

5 Research design

The study employed a quasi-experimental design specifically, the non-equivalent group pre-test post-test design in which four intact classes within the study area were randomly assigned to experimental and control groups. A pre-test was administered to both the experimental and control groups. The pre-test was to ensure that the two groups had the same writing ability thereby ascertaining the homogeneity of the groups. Both the control and experimental groups were post-tested after the treatment group (experimental group) had been exposed to graphic organisers in different types of composition writing. The control group were also exposed to the same content (composition writing) using traditional method. This design is considered appropriate as intact classes were used in order to avoid disruption of the normal academic programme of the schools concerned. Also, the design was adopted because it is the most appropriate in determining the effects of the independent variable (graphic organisers) on the dependent variable (achievement). The design was used to ascertain the effects of graphic organisers on JS2 students' achievement in composition writing. The researchers used a double lesson period of 80 minutes on Mondays and Thursdays only for a period of eight weeks. The population of the study consisted of all the JS2 students in the 10 junior secondary schools in Jos East Local Government Area of Plateau State in the 2019/2020 academic session numbering 732 with 411 males and 321 females. The two schools, GSS Fobour and GSS Febas Kudedu were selected using simple random technique. The schools were labelled school A and school B. School A had 91 students, consisting of 48 males and 43 females; while school B had 68 students consisting of 40 males and 28 female. All the students in the two schools selected for the study formed the sample. The students were taught in their intact classes and these two classes were used for experimental and control groups respectively.

The instrument for data collection in the study was composition writing achievement test (CWAT). The instrument was used as pre-test to assess students' entry behaviour. It was also used as post-test. It was composed of one narrative composition topic on 'my first day in school'. This test tagged 'CWAT' was used to assess students' performance in two writing skills which are idea generation and organisation skills. The total score was 50 marks divided as follows: idea generation 25% and organisation 25%.

6 Research questions

- 1 What is the effect of graphic organisers on JS2 students' idea generation mean scores in composition writing?
- 2 What is the organisation mean scores of JS2 students after exposure to graphic organisers?

7 Hypotheses

- 1 There is no significant difference between the pre-test and post-test idea generation mean scores of JS2 students in the experimental and control groups.

- 2 There is no significant difference between the pre-test and post-test organisation ability mean scores of JS2 students in experimental and control groups.

8 Results and discussion

8.1 Research question 1

What is the effect of graphic organisers on JS2 students' idea generation mean scores in composition writing?

Table 1 The mean scores of students' achievement in idea generation for the experimental and control groups

Group		<i>N</i>	\bar{x}	<i>SD</i>	\bar{x} -diff
Experimental	Pre-test	77	7.90	2.53	4.21
	Post-test	77	12.11	2.86	
Control	Pre-test	82	7.81	2.10	0.75
	Post-test	82	8.56	2.30	

Table 1 shows JS2 students' idea generation mean scores. From the result, the experimental group had a mean score of 7.90 and a SD of 2.53 before exposure to treatment and mean score of 12.1 and a SD of 2.86 after treatment. The experimental group gained a mean difference of 4.21 while the control group had 0.75. The results show that the experimental group who were exposed to treatment, improved in their composition writing performance while the control group that were not exposed to treatment remained as they were in the pre-test.

8.2 Research question 2

What is the effect of graphic organisers on JS2 students' coherent organisation of idea mean scores? The scores of students in organisation was used to answer the research question using mean and standard deviation.

Table 2 The mean scores of students' achievement in organisation for the experimental and control groups

Group		<i>N</i>	\bar{x}	<i>SD</i>	\bar{x} -diff
Experimental	Pre-test	77	6.05	1.92	3.72
	Post-test	77	9.77	2.33	
Control	Pre-test	82	5.87	1.79	0.80
	Post-test	82	6.67	1.88	

The results of the analysis from Table 2 show that the experimental group had a pre-test mean score of 6.05 and a SD of 1.92, a post-test mean score of 9.77 and a SD of 1.79 while the control group had a pre-test mean score of 5.87 and a SD of 1.79, a post-test mean score of 6.67, SD of 1.88. The experimental group had a mean score difference of 3.72 while the control group had a mean score difference of 0.80. From the results, it is

evident that students exposed to pre-writing activities achieved higher in organisation than students that were not exposed to pre-writing activities.

8.3 Hypothesis 1

There is no significant difference between the pre-test and post-test idea generation mean scores of JS2 students in the experimental and control groups. Students' post-test scores in idea generation were used to test this hypothesis using t-test for related samples.

Table 3 Results of the t-test analysis for the experimental and control groups after exposure to treatment in idea generation

<i>Group</i>	<i>N</i>	\bar{x}	<i>SD</i>	<i>Diff.</i>	<i>P-value</i>	<i>Sig.</i>
Experimental	77	12.11	286	157	0.00	0.05
Control	82	8.63	2.32			

The results of the analysis in Table 3 show that the P-value of 0.00 is less than the significant level of 0.05. This therefore shows that the null hypothesis is rejected and the alternative accepted hence, there is a significant difference in the achievement mean scores between the experimental and control groups in favour of the experimental group after exposure to treatment.

8.4 Hypothesis 2

There is no significant difference between the pre-test and post-test organisation of ideas mean scores of JS2 students in the experimental and control groups. The students' post-test scores on organisation were used to test the hypothesis.

Table 4 Results of the t-test analysis for the experimental and control groups in organisation

<i>Groups</i>	<i>N</i>	\bar{x}	<i>SD</i>	<i>Diff.</i>	<i>P-value</i>	<i>Sig.</i>
Experimental	77	9.77	2.33	157	0.000	0.05
Control	82	6.74	1.89			

The results of the t-test analysis from Table 4 reveal that the P-value of 0.000 is less than the significant level of 0.05. Hence, the null hypothesis was rejected in favour of the alternative. Therefore, there is a significant difference in the achievement mean scores of students in organisation between the experimental and control groups after exposure to treatment in favour of the experimental group.

9 Recommendations

The findings of the study revealed statistically significant differences in idea generation and organisation between the experimental and control groups. Based on the findings, it is recommended that

- a teachers of English language should use graphic organisers in teaching writing

- b that more emphasis should be laid on pre-writing activities that will develop students' writing skills
- c the curriculum of teacher training tertiary institutions should have the use graphic organisers incorporated into the English methods course
- d graphic organisers should be included in the training of beginning teachers in the teachers' professional development program (TPDP) as well the continuous professional development (CPD) program.

10 Conclusions

The study confirmed the findings of other studies that graphic organisers enabled students to score high marks in composition writing. The activities also improved students' composition writing skills and their confidence to write. Conclusively, it can be said that graphic organisers are effective in teaching composition writing to junior secondary school students in Nigeria.

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