### Nigerian Journal of Literacy & English Education

#### NIJOLEE





# THINKING AND RETHINKING: THE COMPARATIVE EFFECTS OF 7ES LEARNING MODEL AND METACOGNITIVE STRATEGY ON STUDENTS' PERFORMANCE IN WRITING IN BENUE STATE, NIGERIA

# **Catherine Enayi Ochogwu**

Department of Arts and Social Sciences Education Faculty of Education, Benue State University, Makurdi–Nigeria Email: enaiyikate@gmail.com

# Daniel Eje Ode

Department of Arts and Social Sciences Education Faculty of Education, Benue State University, Makurdi–Nigeria Email: danielode078@gmail.com

#### Abstract

This study investigated the comparative effects of 7Es learning model and metacognitive strategy on senior secondary 2 (SS2) students' performance in essay writing in Oju Local Government Area of Benue State, Nigeria. The study was guided by two research questions and two null hypotheses. The study was anchored on Piaget's (1934) cognitive learning theory and Vygotsky's (1978) social learning theory. The quasi experimental design of pre-test, post-test non-randomised group design was adopted. The population consisted of 3,598 SS 2 students (1,038 males and 2,560 females) in the 2023/2024 academic session. A sample of 57 SS 2 students was drawn using multi-stage sampling technique. The instrument named, Writing Performance Test (WPT), was developed by the researchers and was used for data collection. The instrument was validated by three experts (two in language education and one in test and measurement) and trial tested on 30 students from a different school that is part of the population but not the sample for the study. The trial test was analysed using Kuder-Richardson ( $KR_{-20}$ ) formula which yielded a reliability co-efficient of 0.79. Two intact classes were used for the experiments. Group one was exposed to 7Es learning model and Group two was exposed to metacognitive strategy. The pre-test and post-test scores from the groups were analysed using mean and standard deviation to answer the research questions, while Analysis of Covariance (ANCOVA) was used to test the hypotheses at 0.05 level of significance. The first finding revealed no significant difference in the mean performance scores of SS 2 students taught writing using 7Es learning model and those taught using metacognitive strategy (P = 0.363 > 0.05). The second finding also revealed no significant interaction effect of the strategies (7Es and metacognition) and gender on SS 2 students' mean performance scores in writing (P = 0.473 > 0.05). Based on the findings, it was concluded that interactive strategies such as 7Es learning model and metacognitive strategy are effective for enhancing students' performance in writing. It was recommended that English Language teachers should adopt the use of 7Es learning model and metacognitive strategy to teach writing in order to foster students' independence in writing

Keywords: 7Es Model, Metacognitive strategy, gender, performance, writing

DOI: https://doi.org/10.60787/nijolee.vol2no4.88 (https://doi.org/10.60787/nijolee.vol2no4.88)

#### Introduction

Writing is the most involving and one of the most productive of all English language skills that are taught in the educational system. Ochogwu (2018) opines that writing is the graphic impression of the child's desires, feelings and thoughts. This suggests that when a child writes, his desires, thoughts and knowledge are blended together to create a unique meaning. According to Hammand (2013) writing is a thinking process which involves generating of ideas, composing these ideas in sentences and paragraphs and finally revising the ideas composed. It therefore, means that writing represents what we think. This is because the writing process reflects things which stay in the mind: ideas, thoughts, feelings and desires.

Writing is an important skill for learning. Chen (2016) states that writing is a thinking processwhichcan be planned and given unlimited number of revisions before the final draft. Ochogwu and Ukume (2016) also stress that writing is a difficult skill that must be taught and learned consciously. This implies that ample time must be given to students to practice the act of writing extensively through effective planning, drafting, revising and editing before the final draft.

The relevance of writing in everyday life cannot be over-emphasised. The outcome of writing has contributed to society in different ways like educating children and adults, reporting and analysing significant cultural, political and international events and inspiring and entertaining readers. It equally contributes to individuals' intellectual and emotional development.

Writing is also relevant for cognitive skill development. This is because it requires focusing of attention, planning, fore-thought **and** organisation of one's thinking. All these skills will sharpen and reinforce the cognitive skill development. According to Yusuf, Jusoh and Yunissin (2019), writing enablesexplicit expression of information that can be represented symbolically (e.g. letters, numbers, words, formulae, drawings) and which can then be analysed, critiqued, reproduced and transformed. It can be deduced from the foregoing that writing contributes immensely to the intellectual and emotional development of students thereby sharpening their thinking abilities to perform well in all spheres of life. For more students to gain maximally from the skill of writing, researches (Ochogwu & Muodumogu, 2015; Ukume, Ochogwu & Dankaro, 2017) have proven that interacting with other people can improve a novice's skill to become better. Several interactive strategies have proven to be effective in other fields of study and so using such to investigate the writing skill may be worth the effort. This study focused on the use of 7Es learning model and metacognitive strategy to improve performance in writing.

The 7Es learning model was created by Karplus in the late 1950s and fully developed by Alkin and Karplus (1962) as guided discovery. The 7Es model is named based on the number of stages and the initials of each stage. They are: elicit, engage, explore, explain, elaborate, evaluate, and extend. This entails seven activitybased tasks that students engage in do their academic work or to write. At the first stage, students elicit their prior knowledge on the given topic. They construct mental picture of what to learn and this helps them to relate new information with their existing knowledge (Eisenkraft, 2003). At the engage stage, students think and rethink in order to activate interest on the topic and connect them to what they know (Tonseenon, 2017; Bybee, 2014). The explore stage involves prompting students with questions to read, conceptualise and come up with relative experiences useful to the topic (Tonseenon, 2017). Students try to solve a given problem by working individually. At the explain stage, students learn more about the topic by listening to a model such as oral explanation of the topic by the teacher, while they take down notes to improve on what they already learned about the topic at the exploration stage (Bybee, 2014).

Afterwards, students are allowed at the elaboration stage to practice what they have learnt by developing their experiences, ideas or thoughts. The evaluation stage is the phase where students' knowledge on the topic is consolidated through self-assessment, peer or teacher assessment so as to get feedback (Bybee, 2014).

The extend stage allows for functional learning where students transfer their new experiences to solve problems in other life situations such as those related to the topic (Bybee, 2014).

Supporting students to learn rudiments of writing could be an effective reinforcement and stimulation that may help them to acquire knowledge, abilities and skills they need to become effective writers. Adesoji and Idika (2015) assert that 7Es learning model is a support given to students to provide guidance that will assist them to explore and gain new knowledge and skills for themselves. This shows that 7Es learning model is practical, activity-based and student-centred with effective activities for teaching writing and other language skills.

The 7Es learning model is an inquiry learning process pattern that learners use to investigate knowledge through a process skill and search for knowledge or self-learning experience based on constructivist theory (Polyiem, Nuangchaterm & Wong Chantra, 2012). The 7Es learning model examines learner's prior knowledge for what he/she has known first before learning the new content (Bybee, 2014). The 7Es learning model allows students and teacher to experience common activities, use and build on prior knowledge and experiences, construct meaning and continually assess their understanding of the concept (Eisenkraft, 2003). This implies that 7Es learning model is a learner-centred strategy which is suitable for children.

In a typical 7Es learning model writing lesson, the teacher is required to assess students' prior knowledge in order to know what to teach and how to teach it. This stage is what is called eliciting stage. The teacher afterwards engages students using a variety of topics within students' interest and cognitive capacity. The students are given the opportunity to explore their skills and knowledge on a given topic. This enables them to have in-depth knowledge of the topic to write on. The teacher then gives a detailed explanation of the topic while students listen and take down notes. Teacher guides themto elaborate on the points taken down as note (Abdullahi, Jibrin, Dauda & Danjuma, 2021). For the purpose of assessment, teacher asks students to exchange what they have written with their peers for second

opinion. This is referred to as evaluation stage. Students are guided to review and extend their writings based on the comments, corrections and observations raised at the evaluation stage (Francis & Idika, 2015). This suggests that 7Es learning model aligns with collaborative and constructivist learning model that develops students' cognitive, affective and psychomotor domains.

Previous studies have shown that 7Es learning model enhances students' academic performance. Wodaj and Belay (2021) found that 7Es instructional model and metacognitive strategy significantly improved students' conceptual understanding in Biology without any difference in gender. Maor, Ochogwu and Ukume (2021) also found that an activity-based strategy such as 5Es constructivist instructional approach has no significant difference between male and female students taught summary writing. However, other studies such as Onyilo (2022) revealed that there is a significant difference in the comparative effects of 5E model and scaffolding strategy on students' performance in Physics in favour of scaffolding strategy. Francis and Idika (2015) found that there was a significant mean effect of 7Es on students' achievement in Chemistry with students in the experimental group performing better than those in the conventional group. The study by Hairul (2021) revealed a significant difference in the mean performance scores of students taught Basic Science using 7Es inquiry integrated model than those taught using the conventional method.

Another focus of this research is metacognition. Metacognitive strategy is used by learners to manage, monitor and evaluate their learning activities. Muodumogu (2009) asserts that metacognition is an act of thinking about one's thought. It involves knowledge and control of one's own cognitive processes (Ochogwu, Ukume & Ahmadu, 2018). According to Edgar (2014), metacognition involves thinking and reflecting before, during and after learning tasks. Metacognition starts when students think about the strategies they will use to perform a task. This means that as students become aware of the strategy to be used to learn, they will use the strategy to efficiently acquire new information

and consequently, become more independent thinkers and learners. Student writers employ metacognitive processes or strategies to orchestrate their engagement in their writing processes (Adesoji & Idika, 2015). This suggests that metacognitive strategy is an engagement process designed to monitor the cognitive progress of students' learning.

To use metacognitive strategy in a writing class entails planning, monitoring and evaluating (Lu & Chen, 2012). Planning involves focusing on purpose, audience, ideas and strategies to be used. Planning may also involve brainstorming some key words and choosing the basic tenses for the writing. This often takes place before writing. However, some writers also plan while writing their text (Lu & Chen, 2012). Monitoring is the act of controlling the writing process while writing the text. It refers to checking and verifying progress in terms of features of writing such as content, organisation, expression and mechanics (Stewart, Seifert & Rolheser, 2015). Evaluation takes place after writing, and it consists of reconsidering the written text in terms of features and also concerning the strategies used to complete the writing tasks. Therefore, if students can acquaint themselves with these features or cognitive activities, it will enhance their performance in writing tasks. It also means that through metacognitive strategies of planning, monitoring and evaluating, students will direct, regulate and guide their writing production.

Research findings have indicated that there is significant relationship between students' metacognition and their academic performance in content areas such as Chemistry (Veenam, 2012); and Biology (Stephanous & Mpaiontini, 2017). These findings in content areas suggest that exposing students to metacognitive strategies in other subjects might improve their performance too. Cer (2019) found that metacognitive strategy is effective in improving students' performance in writing as it helps them to engage in selfregulation as part of the writing process. Sachar (2020) found that using metacognitive strategy to revise essay writing improved over 70% of students' performance in writing from the baseline to the final essay. Oktoma, Rafli and Rahamat (2020) found that the group exposed to

metacognitve strategy outperformed the group exposed to concept mapping strategy. It is on this premise that this study sought to examine the comparative effects of 7Es model and metacognitive strategy on students' academic performance in essay writing in Benue State of Nigeria.

Understanding gender relations and the dynamics behind them is a prerequisite for understanding individual capacity to perform a given learning task. This is because gender analysis may facilitate the strategic use of distinct knowledge and skills possessed or acquired by men and women or boys and girls. It also refers to the roles and responsibilities of men and women (Zulikha, 2020). Gender is an integral component of every aspect of economic, social, daily and private life of individuals and societies, and of the different role ascribed by society to men and women. Gender is one of the social factors that determines how language is used in the society. It therefore means that gender plays an important role in English Language learning because it relates to the strategy used in learning and students' performance (Kamari, Georgian & Pazhakh, 2012). The United Nations Educational, Scientific and Cultural Organisation (UNESCO) (2014) asserts that the concept of gender indicates the expectations held about the characteristics, aptitudes and likely behavior of both women and men (femininity and masculinity).

Opinions differ and so are researches about students' academic performance based on gender. Anam (2012) posits that female students performed better in writing narrative texts than male students. Zulikha (2020) asserts that female students outperformed male students in terms of writing fluency and text quality. However, Soori and Zamani (2012) state that males are good writers on opinion related subjects than females because of their ability in expressing their opinions and ideas. Irungu, Nyagah and Mugambi (2019) argue that there are scanty evidences that support the notion that women perform better than men in language learning especially in the area of writing. Based on the inconsistent results on students' academic performance with respect to gender in language learning especially in writing, this

researchtherefore investigated the interaction effect of 7Es learning model and metacognitive strategy on students' performance in writing across gender.

### Statement of the Problem

Writing is a language skill that develops students' critical, analytical and communication skills. However, most senior secondary school students find the learning of writing difficult, tasking and full of abstract activities. Learning to write is a complex activity due to how some language teachers teach it. This is because writing is considered to be a language skill that is full of abstract activities like brainstorming, task analysis and planning among others, which posea lot of problems to most senior secondary school students. This is evident in Ochogwu's (2018) finding; and again the West African Examination Council (WAEC, 2012-2019) Chief Examiners' reports on students' poor performance in English Language. According to the reports, students' weaknesses in writing include poor expressions, punctuation marks error and their inability to construct simple and correct sentences. These are blamed on so many factors including teachers' ineffectiveness in teaching writing and also teaching it as a product instead of as a process that could develop students' ability to write independently.

The use of student-centred and activity-based strategies that develop students' cognitive skills have proven to be effective in developing students' self-confidence, and abilities in the classroom. It is on this basis that this study focused on investigating activity-based 7Es learning model and metacognitive strategy on students' writing. Therefore, the problem of this study posed as question was: What would be the comparative effects of 7Es learning model and metacognitive strategy on students' performance in writing?

# **Research Questions**

The following research questions guided this study:

1. What is the comparative effects of 7Es

learning model and metacognitive strategy on the mean performance scores of Senior Secondary 2 students in writing?

2. What would be the interaction effects of the strategies (7Es learning model and metacognitive strategy) and gender on students' mean performance in writing?

### **Hypotheses**

The following null hypotheses were formulated and tested at 0.05 level of significance:

- 1. There is no significant difference in the comparative effects of7Es learning model and metacognitive strategy on the mean performance of SS 2 students in writing.
- 2. There is no significant interaction effects of the strategies (7Es learning model and metacognitive strategy) and gender on SS 2 students' mean academic performance in writing.

### **Research Method**

The study adopted a non-equivalent pre-test, posttest quasi-experimental design. Two experimental groups were taught writing using 7Es learning model (Experimental Group A) and Metacognitive strategy (Experimental Group B). The population of the study comprised 3,598 SS2 students across public co-educational senior secondary schools in Oju Local Government Area of Benue State in the 2023/2024 session. Using multi-stage sampling technique, 57 SS2 students in two intact classes from two schools were used for the study. Writing Performance Test (WPT) was used for data collection. The instrument was trial tested and it yielded a reliability coefficient of 0.97 using Kuder-Richardson<sub>21</sub> formula (K- $R_{21}$ ). The experiment lasted for eight weeks. The data collected were analysed using mean and standard deviation to answer the research questions and Analysis of Covariance (ANCOVA) to test the hypotheses at 0.05 level of significance.

# Results

The results of this study are presented in tables based on the two research questions and two hypotheses.

# **Research Question One**

What is the comparative effects of 7Es learning model and metacognitive strategy on the mean performance scores of students in writing?

Group		Pre-	Pre-Test		Гest	Mean Gain	
	Ν	-	SD	-	SD	-	
7Es learning model	35	8.69	3.99	17.74	7.79	9.05	
Metacognitive strategy	22	9.50	3.18	15.82	4.84	6.32	
Mean Difference		0.81		1.92		2.73	

#### Table 1: Mean and Standard Deviation of Students TaughtWriting Using 7Es Learning Model

### and Metacognitive Strategy

Table 1 reveals that students taught writing using 7Es learning model had them ean performance score of 8.69 with standard deviation of 3.99 in the pre-test and mean performance score of 17.74 and standard deviation of 7.79 in the post-test. Students taught using metacognitive strategy had the mean performance score of 9.50 with standard deviation of 3.18 in the pre-test and the mean performance score of 15.82 and standard deviation of 4.84 in the post-test. The result further showed that students taught writing using

7Es learning model had the mean gain of 9.05 while those taught writing using metacognitive strategy had the mean gain of 6.32 with mean gain difference of 2.73 in favour of students taught writing using7Es learning model. This indicated that students taught essay writing using 7Es learning model performed better in writing compared to those taught using metacognitive strategy. The comparison in the mean performance of pre-test and post-test scores between students' taught using 7Es learning model and metacognitive strategy in writing is

#### shown graphically in Figure 1

**Figure 1:**Comparative effects of 7Es learning model and metacognitive strategy on the mean performance of SS 2 students in writing

#### **Research Question Two**

What is the interaction effect of the strategies (7Es learning model and metacognitive strategy) and





gender on SS 2 students' mean performance scores in writing?.

Figure 2: Interaction Effect of Strategies and Gender on Performance of Students in Writing

In Figure 2, the profile plot/graph shows the interaction effect of strategies and gender on the performance of students in writing. The

strategies and gender in students' Performance in writing.

### **Hypothesis One**

There is no significant difference in the comparative effects of 7Es learning model and metacognitive strategy on the mean academic performance of SS 2 students in writing.

	Type III Sum of	•			
Source	Squares	df	Mean Square	F	Sig.
Corrected Model	166.140 <sup>a</sup>	2	83.070	1.839	.169
Intercept	1365.243	1	1365.243	30.216	.000
Pre	116.099	1	116.099	2.570	.115
Strategy	67.219	1	67.219	1.488	.228
Error	2439.860	54	45.183		
Total	19079.000	57			
Corrected Total	2606.000	56			

Table 2: ANCOVA Performance of Students Taught Writing using 7Es Learning Model and

# Metacognitive Strategy

Table 2 indicates F value as F(1, 54) = 1.488; p = 0.228 > 0.05. Since the probability level is greater than the specified alpha level of 0.05 the null

hypothesis is not rejected. Thus, it implies that, there is no significant difference in the mean performance scores of SS 2 students taught writing using 7Es learning model and those taught

interaction pattern shows that the plots for male

and female students did not intersect which suggests that there is no interactive effect of

strategies (7Es learning model and metacognitive

strategy) and gender on students' academic

performance in writing. This indicates that there

isno likelihood of an interaction effect between

using the metacognitive strategy.

# **Hypothesis** Two

There is no significant interaction effect of the strategies (7Es learning model and metacognitive) and gender on SS 2 students' mean academic performance in writing.

Source	Type III	Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model		233.898ª	4	58.475	1.282	.289
Intercept		1045.552	1	1045.552	22.920	.000
Pre		146.223	1	146.223	3.205	.079
Strategy		67.191	1	67.191	1.473	.230
Gender		65.397	1	65.397	1.434	.237
Strategy * Gender		.016	1	.016	.004	.985
Error		2372.102	52	45.617		
Total		19079.000	57			
Corrected Total		2606.000	56			

#### in Writing

Table 3 presents the result of the test on interaction effect of strategies (7Es learning model and metacognitive) and gender on SS 2 students' performance in writing, as F(1,52) = 0.004; p= 0.985>0.05. Based on the fact that the obtained probability value (0.985) is greater than the specified alpha level of 0.05, the null hypothesis is therefore not rejected. This implies that there is no significant interaction effect of the strategies (7Es learning model and metacognitive) and gender on senior secondary 2 students' performance in writing.

#### Discussion

The finding based on research question one and hypothesis one revealed that there is no significant difference in the mean performance scores of senior secondary 2 (SS2) students taught writing using 7Es learning model and those taught using the metacognitive strategy. This means that students taught writing using 7Es learning model gained as much understanding in writing as those taught using the metacognitive strategy. This is because 7Es learning model and metacognitive strategy are activity-based teaching strategies that engage students actively to think and rethink tasks in writing so as to effectively achieve the goals of the tasks.

This finding is similar to that of Wodaj and Belay (2021) who found that 7Es instructional model and metacognitive strategy significantly improved students' conceptual understanding in Biology without any difference. This means that activity-based learning strategies of 7Es learning model and metacognitive strategies are effective in the teaching of writing too. In a similar vein, Cer (2019); Sachar (2020) found that metacognitive strategy is effective in improving students' performance in writing skill. Oktoma, Rafli and Rahmat (2020) reported that students exposed to metacognitive strategy did better in argumentative essay than their counterparts exposed to concept mapping.

The finding is also in agreement with other studies such as Francis and Idika (2015) and Hairul, (2021). Francis and Idika (2015) found that there was a significant mean effect of 7Es on students' achievement in Chemistry with students in the experimental group performing better than those in the conventional group treated with the traditional method. The study of Hairul (2021) revealed a significant difference in the mean performance scores of students taught Basic Sciences using 7Es inquiry integrated model than those taught using the conventional method. This implies that 7Es learning model is an effective model for improving students' performance in writing and science subjects such as Physics, Biology, Chemistry and Basic Science.

The finding of research question two and hypothesis two showed no significant interaction effect of the strategies (7Es learning model and metacognitive strategy) and gender on SS 2 students' mean performance scores in writing. This means that the gender of students does not matter in teaching and improving students' performance using 7Es learning and metacognitive strategy in writing. This is because gender becomes an insignificant factor and has nothing to do with the cognitive structure; if all students are exposed to similar learning situations, they will all perform equally well. This finding validated of Maor, Ochogwu and Ukume (2021) who found that there is no significant difference between male and female students taught summary writing using 5Es constructivist instructional approach. This may be so because 5Es constructivist instructional approach is a process-oriented learning strategy that is studentcentred and activity-packed just like 7Es learning model. However, the result of this study disagrees with the finding of Onyilo (2022) who reported that there was a significant difference in the comparative effectiveness of 5Es model and scaffolding strategy on SS2 students' academic performance in physics. The difference was in favour of scaffolding strategy. This implies that 5Es constructivist approach, which is an off-shoot of 7Es learning model may be more effective in teaching writing than physics.

The finding of this study affirms the report of Onyilo (2022) who found that there is no significant interaction effects of scaffolding, 5E strategies and gender on students' performance in Physics. This implies that scaffolding and 5E strategies are among effective strategies that provide equal opportunities to both male and Nigerian Journal of Literacy & English Education

# NIJOLEE

female students to think and rethink.

# Conclusion

Based on the findings of this study, it was concluded that interactive strategies such as 7Es learning model and metacognitive strategy are effective for enhancing students' performance in essay writing. It was also concluded that both 7Es learning model and metacognitive strategy are effective strategies that provide equal opportunities to male and female students to explore knowledge and think critically so as to express themselves through writing.

# Recommendations

Based on the findings, it was recommended that:

- 1. English Language teachers at the senior secondary school level should be encouraged to adopt the use of 7Es learning model and metacognitive strategy to teach writing in order to foster students' independence in writing.
- 2. Language teachers in secondary schools should be encouraged to promote interaction among male and female students in writing in order to create room for exploration, explanation and self-evaluation of their writing before publication.
- 3. Secondary school administrators should be sensitised on the need to organise school based workshops for teachers on innovative and activity-based interactive strategies such as 7Es learning model and metacognitive strategy to equip them to teach writing and other language skills effectively.
- 4. Curriculum planners and English Language textbooks writers should be encouraged to incorporate the use of 7Es learning model and metacognitive language activities into the writing curriculum and English language texts.

# REFERENCES

Abdullahi, A.C., Jibrin, A.G., Dauda, M.O., & Danjuma, I.M. (2021). Effect of 7Es learning strategy on retention of secondary school students in Biology in Bauchi Metropolis, Bauchi State, Nigeria. *Global Journal of Education, Humanities and Management Sciences*, 3(1), 125-136.

- Adesoji, F.A., & Idika, M.I. (2015). Effects of 7Es learning cycle model and case-based learning strategy on secondary school students' learning outcomes in Chemistry. *JISTE*, 19(2), 46-49.
- Anam, M.C. (2012). Differences between the second semester students' writing achievement of narrative text based on gender at Baturaja University, Indonesia, Unpublished PhD Thesis, University of Melang.
- Alkin, J.M., & Karplus, R. (1962). Discovery or invention? *Science Teacher*, 29(5), 45.
- Bybee, R.W. (2014). The BSCS 5E instructional model: Personal reflections and contemporary implications. *Science and Children Journal*, 51(8), 10-13.
- Cer, E. (2019). The effect of metacognitive strategies on the writing skills of pupils in secondary education in Turkey. *Erkan Cer Education Faculty, Armasya, University of Turkey*.
- Chen, C. (2016). A case study of teaching English writing through reading in senior high school. M.A. thesis Shandong Normal University, Jinan China.
- Eisenkraft, A. (2003). Expanding the 5E model: A proposed 7Es model emphasizes "Transfer of learning and the importance of eliciting prior understanding". *Science Teacher*, 70(6), 56-59.
- Francis, A. A., & Idika, M. I.,(2015). Effects of 7Es learning cycle model and case-based learning strategy on secondary school students' learning outcomes in chemistry. *JISTE*, 19(2), 46-49.
- Hairul, D.M. (2021). Effects of 7Es inquiry integrated model on learning achievement of Form two basic science students with different cognitive level. *Science Teacher*, 29(5), 60-69.

- Hammand, A.E. (2013). Palestinian EFL university level students' use of writing strategies in relative to their EFL writing performance. *Journal of Basic and Applied Scientific Research*, 3)10), 214-223.
- Kamari, E., Georgian, R., & Pazhak, A. (2012). Morbidity assessment according to gender in Georgian students. *Journal of Georgian Medical School*, 3(321), 91-96.
- Lu, F., & Chen, H. (2012). A study of metacognitive strategies based on writing instruction for vocational college studies. *English Language Teaching*, 3(3), 136-144.
- Maor, C.M., Ochogwu, C.E., & Ukume, G.D. (2021). Effect of 5Es constructivist instructional approach on students' performance in English Language summary writing in Makurdi, Benue State, *Prestige Journal of Counselling Psychology*, 4(2), 1-12.
- Muodumogu, C.A. (2009). An evaluation of Benue State University s 16(1), 46-54.tudents' awareness and application of metacognitive strategies to reading. *Literacy and Reading Journal in Nigeria*, 12(1), 95-103.
- Ochogwu, C. E., & Muodumogu, C. A., (2015).Innovation in literacy: Using Directed-Reading-and-thinking-activities (DRTA) to teach comprehension to junior secondary school two students. International Journal of Literacy and Development, 2 (1), 7-14.
- Ochogwu, C. E., & Ukume, G. D. (2016). Developing literacy skills: The pearls of story-telling in creative writing across gender. *Literacy and Reading in Nigeria*, 16(1), 46-54.
- Ochogwu, C.E. (2018a). Practices that work: The know-what-learn (KWL) reading classroom. In E.E. Achor, N.A. Ada, A.U. Ojoronka & E.I. Ettang (Eds). *Rethinking teaching education in Nigeria*, 228-240. Makurdi: Department of Curriculum and Teaching, Benue State University.

- Ochogwu, C. E. (2018b). Quality education: Can expression errors affect students' achievement in essay writing? *Journal of Research in Curriculum and Teaching*, 10(2), 55-67.
- Ochogwu, C.E., Ukume, G.D., & Ahamadu, N. (2018). Metacognitive instructional strategies: Vehicle to students' achievement in reading comprehension. *ICSHER Journal*, 4(1), 43-53.
- Okoro, C.O. & Chukwudi., E.K. (2012). Metacognitive strategies available to selfdirected learning. *Journal of Educational and Social Research*, 1(4), 7-11.
- Oktoma, E., Rafli, Z., & Rahamat, A. (2020). Metacognitive strategies in argumentative writing. *An Interdisplinary Journal*, 29(8), 981-1011.
- Onyilo, F.A. (2022). Comparative effects of scaffolding and 5E instructional strategies on students' critical thinking and performance in Physics in Otukpo, Benue State, Nigeria. Unpublished Master's dissertation, Benue State University, Makurdi.
- Polyiem, T., Nuangchaterm, P., & Wong Chantra, O. (2012). Learning achievement, science process skills and moral reasoning of ninth grade students learned by 7Es learning cycle and scientific issue based learning. *Australian Journal of Basic and Applied Science*, 5(10), 257-263.
- Tonseenon, K. (2017). The effect of 5E learning cycle model on achievement and science lesson proceeding of ISER 58<sup>th</sup> International Conference in Kobe Japan, 6<sup>th</sup>-7<sup>th</sup> June, 2017, pp. 36-39.
- Ukume, G. D., Ochogwu. C. E., & Dankaro. J. T. (2017). Teaching reading interactively: Its implications on literacy development and curriculum innovation in a globally depressed economy. *Benue State University Journal of Education*, 17(1), 189-195.

Nigerian Journal of Literacy & English Education

- UNESCO, (2014) Quality education. Retrieved from <u>http://www</u>. Unescobkk.org/education/efa/Efa goal/quality-education/
- Veenam, M. (2012). Metacognition in science education: Definitions, constituents and their intricate relation with cognition. In A, Zahar and Y. J. Dori (Eds). Metacognition in science education trends in current researches, 11(1), 1-19.
- Sachar, O. C. (2020). Revising with metacognition to promote writing achievement: A case study. *Journal of the Scholarship of Teaching and Learning*, 20(3), 49-63.
- Stephanous, G., & Mpiontini, M. (2017). Metacognitive knowledge and metacognitive regulation in self-regulatory learning style and its effects on performance across diverse school subject. *Psychology*, 8(12), 1941-1975.
- Stewert, G., Seifert, T.A. & Rotheiser, C. (2015). Anxiety and self-esteem's relationship with undergraduate students' perceptions of the use of metacognitive writing strategies. *Canadian Journal for the Scholarship of Teaching and Learning*, 6(1), 81-97.

- Soori, A.,& Zamani. (2012). Language features in the writing of male and female students in English and Persian. *European Journal of Social Sciences*, 33(2), 324-329.
- West African Examination Council's Chief Examiner's Report (2012-2019). Test results by country. Retrieved on June, 30, 2 0 2 0 from <u>http://.www.waecheadquarter.org/index.ph</u> <u>p?option=con-</u>
- Wodaj, H., & Belay, S. (2021). Effects of 7E instructional model with metacognitive scaffolding on students' conceptual understanding in Biology. *Environment and Health*, 7(1), 26-36.
- Yusuf, Q, Jusoh, Z. & Yunissin, Q.Y. (2019). Cooperative learning strategies to enhance writing skills among second language learners. *International Journal of Instruction*, 2(1), 1399-1412.
- Zulikha, A. (2020). Gender differences in writing: The mediating effect of language proficiency and writing fluency in text quality in Saudi Arabia. *Journal of Teacher Education and Development*, 7(1), 1-19.