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Interaction Effect of Concept Mapping Strategy on Pupils' Achievement in Vocabulary Across School Type in Makurdi Local Government Area, Benue State.

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Abstract

This study investigated the interaction effect of concept mapping strategy on basic 5 pupils' achievement in vocabulary across school types in Makurdi Local Government Area of Benue State. Two research questions and two hypotheses guided it. A quasi-experimental research design was adopted for the study. A proportionate stratified random sampling technique was used to sample 103 lower basic five pupils in four intact classes. Vocabulary Achievement Test (VAT) was used for data collection and lesson plans were used for treatment. Mean and standard deviation were used to analyze the data while Analysis of covariance (ANCOVA) was used to test two hypotheses at 0.05 level of significance. The findings of the study showed that pupils in public primary schools performed better than pupils in private primary schools in vocabulary achievement when taught using a concept mapping strategy. The study also revealed that the interaction effect of concept mapping and school type on pupils' achievement in vocabulary was not statistically significant. The study recommended among other things that English Language teachers in both private and public schools should refrain from limiting themselves to the use of only a dictionary in teaching vocabulary.

Keywords: Concept mapping, Vocabulary, Interaction, Pupils, School type.

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INTRODUCTION

Vocabulary is one of the vital components of English Language. This entails that without vocabulary communication cannot take place effectively. This implies that the teaching of vocabulary is an important aspect of English Language learning and teaching. Thus, without words to express a wide variety of meanings, communication in a second language cannot take place in a significant manner. Vocabulary therefore refers to the kind of words that students ought to know to read in increasingly demanding text with understanding. [17] defines vocabulary as the words learners of languages learn in order to communicate efficiently with people. A new item of vocabulary could be more than a single word, a compound or two or three word, and multi-word idioms. By implication, vocabulary means words or full sentences institutionalized utterances that convey social or pragmatic meaning within a given community. [3] view vocabulary as an understanding of lexis, the Greek word which in the English Language means all the words in a language or the entire vocabulary of a language. By implication, vocabulary includes lexical chunks, phrases of two or more words such as “Nice to meet you” which research suggests children and adults learn as a single lexical unit. This entails that vocabulary addresses single-item words with specific meaning (s). The lexical units involve pronunciation (spoken form), spelling (written form), and any word parts that make up this particular item such as a prefix, root, and suffix. For instance, word part can be seen with the word uncommunicative, where the prefix “un” means negative or opposite, “communicate” is the root word, and “live” is a suffix indicating that someone or something can do something.

Vocabulary is very important to all learners across all levels of education. Thus, the size of vocabulary possessed by a student may determine that student’s achievement in exercises such as reading[16]. Moreover, possession of a rich vocabulary by someone is an indication that the individual is educated [4]. The large vocabulary supports the individual’s ability to learn about the world, encounter new ideas, and enjoy learning. This entails that students that have rich vocabulary express their ideas more intelligently, both in oral and written forms.

In the English Language, mastery of vocabulary or rich vocabulary helps students to gain knowledge during independent reading just as it equips the students to participate intelligently during classroom discussions [11] This can further develop students’ critical thinking, problem-solving, and decision-making skills. Poor vocabulary therefore results in poor communication and social interaction skills. These skills are important at workplaces. Thus, a lack of skills leads to low creativity and productivity among workers [15]. This explains why students need to develop their vocabulary to be useful in their future workplaces.

Over the years, pupils’ vocabulary inadequacy has become a major concern in the study of English Language because teachers hardly use appropriate strategies for teaching vocabulary. [22] rightly posits that in many classrooms, vocabulary is not being taught meaningfully. As a result of this, English Language teachers resort to asking pupils to find out the meanings of words in the dictionary. The conventional strategy of teaching vocabulary requires English Language teachers to assign the pupils/students to look up words in dictionaries and state definitions, parts of speech, synonyms, and antonyms [12]. This implies that the pupils tend to copy the definition, repeat it back to the instructor, and shortly forget the word altogether.

Researchers over the years suggest that concept mapping strategy could improve pupils' achievement in vocabulary [1] ; [7] ; [18] see concept mapping as a graphic tool for organizing and representing knowledge and information. It includes concepts and the relationships between them. They are usually enclosed in circles or boxes. Thus, words or phrases (Crosslinks) specify the relationship between two concepts. Concept mapping usually starts with a general concept on the top of the map and then works its way down through a hierarchical structure to more specific words. The use of concept mapping according to [18] is of great importance to pupils' acquisition of vocabulary because teachers may use it as a teaching strategy to facilitate meaningful learning of words by scaffolding and putting the pieces of knowledge in a structured form. Research has indicated that there has been a high achievement in students' academic performance when the concept mapping strategy is used (Hay, Kirchin & Lygo-Baker, 2008; [24] ; [6] have also revealed that concept mapping strategy can be used as a successful teaching and learning strategy for all levels of education. [14] investigated the effect of teaching English reading comprehension to students using concept mapping and found that it was an effective strategy in helping students of languages acquire critical skills of comprehension. Other researchers affirm the effectiveness of concept mapping on pupils' achievement in vocabulary, (Asan, 2007, Chou, 2008; [9] ; Liu, Chen & Chung, 2010, [5]. These researchers hold this view because when a general concept is identified and properly assimilated, it reduces rote learning. [25], maintain that the teaching and learning of vocabulary through concept mapping enhances easy acquisition of words.

The differences in academic performance of the pupils between public and private school pupils could be attributed to teaching strategies. Frenette and Chan's (2015) findings revealed significant differences in academic achievement between public and private schools. Other research findings also revealed that there exists a gap between the academic achievement of students in public and private schools [8] ; Mead, 2014). Evidence from other researchers reveals that pupils' in private primary schools score significantly higher in vocabulary, reading, and a test of composite vocabulary. [8] affirmed in his findings that the average scores of pupils in private schools in most instances exceeded those in public schools in every single field of study. The findings of [21] and [23] revealed that private school pupils perform better than public school pupils. The study revealed that in vocabulary, and writing tests, pupils in private schools outperformed public school pupils sometimes by a wide margin. The researchers therefore wish to find out the effect of concept mapping strategy on pupils' achievement in vocabulary across school types in Makurdi Local Government Area, Benue State.

PROBLEM STATEMENT

Vocabulary is an essential aspect of the English Language that is useful to receptive skills; reading and listening as well as expressive (productive) skills; speaking and writing. However, it is quite unfortunate that pupils/students cannot read and understand due to a low vocabulary base. Over the years, pupils in public and private primary schools in Makurdi Local Government area of Benue State have been deficient in vocabulary. This has greatly affected pupils' mastery of the four basic skills of language. Consequently, this has led to pupils' inability to express themselves in English Language fluently.

Research has shown that teaching vocabulary may be problematic because many teachers are not confident about the best practices in teaching vocabulary and at times do not know how to apply the strategies in teaching vocabulary (Berne & Blachowicz, 2008). Thus, most teachers of English Language adopt conventional strategies in teaching vocabulary. This seems not to be helping to improve students'/pupils' interest therefore it affects pupils' achievement in vocabulary greatly. The problem of this study, therefore, is

what will be the interaction effect of concept mapping strategy on basic five pupils' achievement in vocabulary across school types in Makurdi Local Government Area, Benue State?

Research Questions

The study was guided by the following research questions:

- i. To what extent would the mean performance scores of pupils exposed to concept mapping differ across school types?
- ii. What is the interaction effect of concept mapping on pupils' achievement in vocabulary across school types?

Hypotheses

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

- i. There is no significant difference in the mean achievement scores in the vocabulary of public and private school pupils taught using concept mapping.
- ii. There is no significant interaction effect of concept mapping strategy and school type on pupils' achievement in vocabulary.

METHODOLOGY

The study adopted quasi-experimental design using pre-test and post-test. The sample of this study consisted of 201 lower basic five pupils in four intact classes sampled from the 163 primary schools in Makurdi LGA, Benue State. The researcher used a proportionate stratified random sampling in sampling the schools. Two schools were randomly assigned to the experimental group while the other two were assigned to the control group.

The researcher used vocabulary achievement Test (VAT) and lesson plans as treatment for data collection. The VAT had 25 items taken from the topics taught. The pre-test and post-test were the same except that the numbering of the items was changed during post-test. The pre-test was administered prior to the treatment to ascertain pupils' achievement in vocabulary before the intervention.

The concept mapping strategy was used in teaching pupils in the experimental group while the control group was exposed to the use of dictionary strategy. The experiment lasted for eight weeks within which six lessons were taught. The pupils were taught words associated with modern means of communication, hospital, soil, sickness/treatment, fine-arts and marriage. The researcher administered post-test after the intervention programme to establish the effect of concept mapping on pupils' achievement in vocabulary. The pre-test and post-test scores of the experimental and control group were compared. The researcher used 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.

RESULTS

Data were analyzed and interpreted based on the two research questions and hypotheses. The research questions were answered using mean and standard deviation while Analysis of Covariance (ANCOVA) was

used to test the hypotheses at 0.05 level of significance. The discussion of the findings is based on the variables of the study which are guided by research questions and hypotheses.

Research question 1:

To what extent would the mean performance scores of pupils exposed to concept mapping differ across school type?

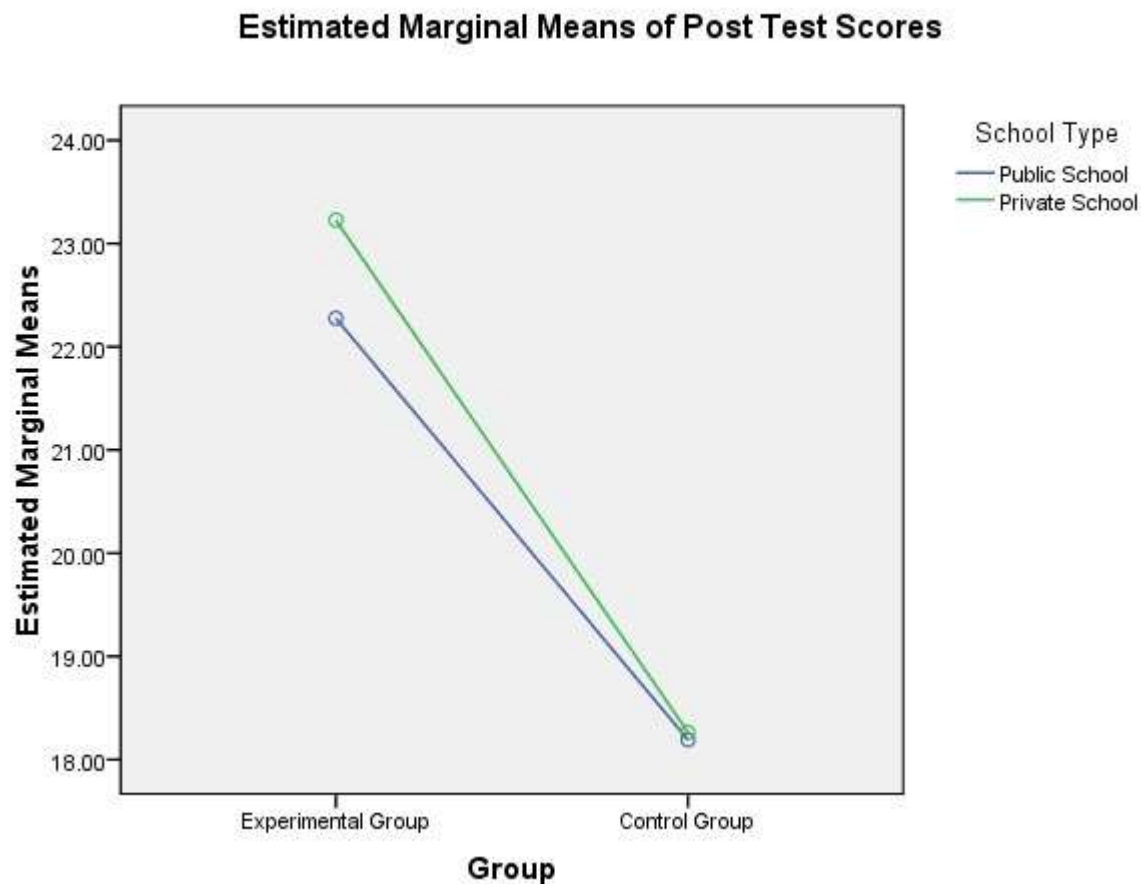
Table 1: Mean vocabulary achievement scores and standard deviation of pupils from public and private schools exposed to concept mapping

		Pre -Test		Post-Pest		
School type	N	Mean	Std	Mean	Std	Mean
			Dev		Dev	Gain
Public School	74	13.19	2.89	22.14	1.42	8.95
Private School	39	16.92	3.96	23.56	1.59	6.64
Mean Difference		-3.73		-1.42		2.31

Table 1 reveals the pre-test mean score of pupils from public school as 13.19 with standard deviation of 2.89 and that of pupils from private school as 16.92 with standard deviation of 3.96. The table reveals the post-test mean scores of pupils from public school as 22.14 with 1.42 as standard deviation while pupils from private school had 23.56 and 1.59 as mean and standard deviation. The mean gains were 8.95 for pupils in public school and 6.64 for pupils in private school. The mean gain difference was 2.31 in favour of the public school pupils. The result has answered the research question which seeks to establish the difference between public and private school pupils' achievement in vocabulary. This means that public pupils performed better than private school pupils.

Research Question 2

How would the interaction effect of concept mapping strategy and school type differ in pupils' vocabulary achievement?

**Figure**

1: Interaction effect of concept mapping strategy and pupils' achievement in vocabulary by school type

Figure 1 presents the profile plot showing the interaction effect of concept mapping strategy and pupils' achievement in vocabulary by school type. The interaction pattern shows that the plots for pupils in public and private schools were not parallel as the plots are almost intercepting at control group. This indicates that it is likely to have an interaction effect between concept mapping strategy and school type.

Hypothesis 1

There is no significant difference in the mean achievement scores in vocabulary of public and private schools' pupils taught using concept mapping.

Table 2: ANCOVA tests of effect of concept mapping on vocabulary achievement of pupils from public and private schools

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	58.40	2	29.20	13.61	0.00
Intercept	2395.934	1	2395.93	1116.79	0.00
Pretest	6.25	1	6.25	2.91	0.09

School type	26.55	1	26.55	12.37	0.00
Error	235.99	110	2.15		
Total	58155.00	113			
Corrected Total	294.39	112			

Table 2 shows that $F_{1110} = 12.37$ and $p=0.00$ for school type. Since the significant value (p) is less than the set significant value ($p<0.05$), the null hypothesis was rejected. The implication is that pupils from public school exposed to concept mapping significantly gained higher mean achievement scores in vocabulary when compared to their counterparts in private schools exposed to the strategy.

Hypothesis 2

There is no significant interaction effect of concept mapping strategy and school type on pupils' achievement in vocabulary.

Figure 1 shows that $F_{1, 192} = 3.24$ and $p=0.07$ for concept mapping strategy group and school type. Since the significant value (p) is greater than the set value for the study ($p>0.05$), the null hypothesis was not rejected. Therefore, the study concludes that the interaction effect of concept mapping and school type on pupils' achievement in vocabulary was not statistically significant.

DISCUSSION

The study investigated the effect of concept mapping on Basic Five pupils' achievement in vocabulary across public and private primary schools in Makurdi Local Government Area of Benue State. The discussion of findings is strictly based on the variables of the study which are guided by research questions and hypotheses.

The finding of this study showed that the pupils who were taught vocabulary using concept mapping strategy achieved better than those that were taught using dictionary. This clearly indicates that there is significant difference between the mean performance scores of pupils taught vocabulary using concept mapping strategy and those in control group. Thus, the pre-test and post-test result (Tables 1 and 2) show the effectiveness of concept mapping on pupils' achievement in vocabulary. This means that teachers of English Language that use concept mapping strategy in teaching pupils vocabulary enhance pupils' achievement in vocabulary more than their counterparts that are taught using conventional strategy. By implication, concept mapping stimulates the process of learning vocabulary.

The result of this study is equally in line with an earlier research by [6] who found that learning vocabulary through concept mapping strategy enhances effective acquisition of vocabulary. This is because it presents the structure of concepts and their relationships in the simplest form. Consequently, concept mapping as investigated by the researchers revealed that it reduces rote learning. The findings is also in conformity with the views of several other researchers like [14] and [24] whose findings indicated that concept mapping is an effective strategy which improves learners' achievement.

The results of this study confirm the views of [5] that learners' achievement in vocabulary and other related fields of study improved significantly when concept mapping strategy was used. Their research

found that the concept mapping strategy facilitates pupils' meaningful learning of words by scaffolding and putting the words to be acquired in a structural form.

Similarly, [18] found that concept mapping strategy enhances better achievement in vocabulary. This is because concept mapping strategy enables teachers to brainstorm new words and present the words to be learnt in a step by step approach. Also, the present study confirms [25], findings that teaching and learning of vocabulary through concept mapping enhances easy acquisition of words. This is because the teaching strategy presents new words to the learners ranging from top to lowest with interrelated links that simplify the exact meaning of the words to be incorporated into existing knowledge. The present study established that if teachers constantly make use of concept mapping strategy, it would significantly improve pupils' achievement in vocabulary.

The result of this finding reveals that there is significant difference in achievement in vocabulary of pupils in public and private schools exposed to concept mapping. The result shows that pupils from public schools who were exposed to concept mapping strategy significantly gained higher in the vocabulary achievement test than their counterparts in private schools. It is evident from the finding that public school pupils had higher achievement scores than private school pupils.

This present finding is in contrast to [23] whose findings showed that private primary school pupils performed better than pupils in public school. The sharp contrast found in this study could be attributed teachers' inexperience and proficiency factors. Similarly, the finding of this study disagrees with [21] who found that private school pupils performed significantly better than public school pupils in reading, writing, speaking and listening skills. The finding of the present study is also in sharp contrast to the findings of Mead, (2014) who found that pupils in private schools score significantly higher in other fields of study and vocabulary.

It is interesting to note that this study found that pupils in public schools outperformed pupils in private schools. The sharp contrast in the findings could be attributed to teaching experience and area of specialization. That is, the two teachers from the sampled public schools had more teaching experience than the two teachers recruited in the private schools to serve as research assistants. One of the two research assistants studied Biology but was employed to teach basic five English language while the other teacher studied English language education but had only one year teaching experience. The researcher envisaged that this could be the reason why the present study is in sharp contrast with several other researchers like (Mead, 2014; [8].

The researcher attributed the difference in the present finding and other researches to the aforementioned factors because the research assistants in both public and private schools were given adequate learning materials. On the other hand, the English language teachers in the public schools were more experienced than the teachers in private schools. Therefore, the public school pupils outperformed the pupils in private schools.

CONCLUSIONS AND RECOMMENDATIONS

There has been a public outcry over the years that vocabulary has been most often taught out of context. This has led to pupils' inadequate vocabulary knowledge and poor achievement in vocabulary. It is also observed that many teachers of English language hardly use appropriate strategies of teaching

vocabulary. In an attempt to solve this problem, this study investigated the effect of concept mapping strategy on pupils' achievement in vocabulary across school type in Makurdi, Benue State.

The following recommendations were made in line with the findings of the study.

1. Proprietors/proprietresses of private schools should strive to always organize seminars at the beginning of each term for English language teachers to update their knowledge of teaching strategies. This will not only improve pupils' achievement in vocabulary but will also widen teachers' horizons in different teaching strategies.
2. English language teachers in both private and public schools should refrain from limiting themselves to the use of only dictionary in teaching vocabulary. This will enable teachers of English Language to use different strategies of teaching vocabulary.
3. The government and owners of private schools should always employ only qualified and certified teachers who studied English language. Teachers who are not trained as English language teachers should not be assigned to teach the English language.

REFERENCES

- [1] Abrams, R. (2009). *Meaningful learning: A collaborative literature review of concept mapping*. Retrieved March 18, 2023. <https://www2.ucsc.edu/mlrg/clr-conceptmapping.html>
- [2] Alizadeh, I. (2016). Vocabulary teaching techniques: A review of common practices. *International Journal of Research in English Education*, 1(1), 22–30. <http://ijreeonline.com/article-1-25-en.html>
- [3] Barcroft, J., Sunderman, G., & Schmitt, N. (2011). *Vocabulary and its importance in language learning*. Retrieved August 3, 2015, from <http://www.sde.ct.gov>
- [4] Beck, I. L., McKeown, M. G., & Kucan, L. (2013). *Bringing words to life: Robust vocabulary instruction* (2nd ed.). Guilford Press. <https://www.guilford.com/add/beck8-studyguide.pdf?t=1>
- [5] Brinkerhoff, J. L., & Booth, G. M. (2013). The effect of concept mapping on students' achievement in an introductory non-majors biology class. *European International Journal of Science and Technology*, 2(8), 43–72.
- [6] Cheema, A. B., & Mirza, M. S. (2013). Effect of concept mapping on students' academic achievement. *Journal of Research and Reflections in Education*, 7(2), 125–132. <https://gscjournal.com/IJLDI>
- [7] Chularut, P., & DeBacker, T. K. (2004). The influence of concept mapping on achievement, self-regulation, and self-efficacy in students of English as a second language. *Contemporary Educational Psychology*, 29, 248–263. <https://doi.org/10.1016/j.cedpsych.2003.09.001>
- [8] Cookson, W. (2014). New kid on the block? A closer look at America's private schools. Retrieved March 23, 2023, from <https://www.brookings.edu/articles/new-kid-on-the-block-a-closer-look-at-americas-private-schools/>
- [9] Erdogan, Y. (2009). Paper-based and computer-based concept mapping: The effects on computer achievement, computer anxiety, and computer attitude. *British Journal of Educational Technology*, 40(5), 821–836. <https://doi.org/10.1111/j.1467-8535.2008.00856.x>
- [10] Fischer, B. (2008). Just 12% of Idaho parents would choose public school if had a choice. Retrieved June 27, 2014, from <http://www.renewamerica.com/columns/fischer/080404>

- [11] Friedberg, C., Mitchell, A., & Brooke, E. (2016). *Understanding academic language and its connection to school success*. Retrieved March 20, 2023, from <https://www.texialearning.com/sites/default/files>
- [12] Greenwood, S. C. (2002). Making words matter: Vocabulary study in the content areas. *The Clearing House*, 75, 258–263. <https://doi.org/10.1080/00098650209603951>
- [13] Jamal, M. W. B., & Iqbal, Y. (2023). Use of artificial intelligence in practicing and learning preposition of English language at diploma level. *International Journal of Emergency Multidisciplinary: Social Sciences*, 2(2), 1–13. <https://doi.org/10.54938/ijemdss.2023.02.2.248>
- [14] Kalhor, M., & Shakibaei, G. (2012). Teaching reading comprehension through concept maps. *Life Science Journal*, 9(4), 725–731. https://www.lifesciencesite.com/ljsj/life0904/113_11652life0904_725_731.pdf
- [15] Kaur, J., & Hegelheimer, V. (2015). ESL students' use of concordance in the transfer of academic word knowledge: An exploratory study. *Computer-Assisted Language Learning*, 18(4), 287–310. <https://doi.org/10.1080/09588220500280412>
- [16] Loftus, S. M., & Coyne, M. D. (2012). Vocabulary instruction within a multi-tier approach. *Reading and Writing Quarterly*, 29(1), 4–19. <https://doi.org/10.1080/10573569.2013.741942>
- [17] Nhung, M. T. (2011). *Difficulties in teaching and learning vocabulary in the textbook "English for food production staff" for second-year pre-intermediate students at Hanoi Tourism College* (Unpublished M.Ed thesis). University of Foreign Language and International Studies, Vietnam.
- [18] Novak, J., & Cañas, A. (2006). *The theory underlying concept maps and how to construct them*. Cambridge University Press. http://proiac.sites.uff.br/wp-content/uploads/sites/433/2018/08/novak_j.d._2.pdf
- [19] Nushi, M., & Jenabzadeh, H. (2016). Teaching and learning academic vocabulary. *California Linguistic Notes*, 40(2), 51–70. https://english.fullerton.edu/publications/cln/clncurrentissue/CLN_Nushi_Academic%20Vocabulary%20.pdf
- [20] Obafemi, S. P. (2023). A review of Walter Rodney's *How Europe underdeveloped Africa*. *International Journal of Emergency Multidisciplinary: Social Sciences*, 2(1), 1–11. <https://doi.org/10.54938/ijemdss.2023.02.1.182>
- [21] Ogbonna, S. O. (2009). Gender, school type, and location as predictors of success in Igbo literacy achievement of primary school pupils in Imo State, Nigeria. *Journal of the Reading Association of Nigeria*, 12(1), 64–72.
- [22] Oyetunde, T. O., & Muodumogu, C. A. (1999). *Effective English teaching in primary and secondary schools: Some basic considerations and strategies*. Conference on Educational Improvement. <https://scholar.google.com/scholar?cluster=754707674561394891&hl=en&oi=scholar>
- [23] Tanveer, A. M., & Afzal, M. (2015). Comparison of students' satisfaction and achievement at secondary school level in Islamabad. *American Journal of Educational Research*, 3(12), 1524–1527. doi: 10.12691/education-3-12-7
- [24] Udu, T. T. (2016). Concept map structures and descriptive composition among junior secondary school two (JSS II) students in Makurdi, Benue State, Nigeria. *Benchmark Journals*, 1(1), 62–74.
- [25] Wilson, G., Nash, M., & Earl, G. (2010). Supporting students with language learning difficulties in secondary schools through collaboration: The use of concept maps to investigate the

impact on teachers' knowledge of vocabulary teaching. *Child Language Teaching and Therapy*, 26(2), 163–179. <https://doi.org/10.1177/0265659010368749>