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EFFECTS OF SYNTHETIC PHONICS STRATEGY ON PRIMARY SCHOOL PUPILS' ACHIEVEMENT IN LITERACY SKILLS IN KATAGUM LOCAL GOVERNMENT AREA, BAUCHI STATE, NIGERIA

Musa Usman Tilde
Department of English,
Aminu Sale College of Education, Azare Bauchi State.
Email: musausmantilde@gmail.com

Jeno-Mary Enighe
Department of Arts Education,
Faculty of Education,
University of Jos, Plateau State.

Mary Ocheenia Anyebe
Department of Arts Education,
Faculty of Education,
University of Jos, Plateau State.

Abstract
*Observations showed that most primary school pupils in KatagumLocal Government Area of Bauchi State cannot recognize words in print let alone read for meaning. In response to the occasion, this study investigated the effects of synthetic phonics strategy on primary school pupils' achievement in literacy skills in Katagum Local Government Area of Bauchi State, Nigeria. Quasi-experimental pre-test and post-test research design of non-equivalent groups was adopted in the study. A sample of 64 primary four pupils was selected and assigned to the experimental (synthetic) and control (conventional) groups using simple sampling technique. Two research questions and two corresponding null hypotheses guided the study. Word Reading Achievement Test (WRAT) and Word Spelling Achievement Test (WSAT) were used as instruments for data collection. Data collected were analysed using mean and standard deviation to answer the research questions and ANCOVA to test the null hypotheses at 0.05 level of significance. The*major *finding revealed that there was a significant effect of synthetic phonics strategy on pupils' achievement in phonemic awareness. The finding further revealed that synthetic phonics strategy significantly improved pupils' achievement in letter formation. It was, therefore, concluded that if the strategy is adopted by the English Language teacher, pupils' literacy skills will improve significantly. Based on the findings and conclusion of the study, it was recommended thatteachers of English should model synthetic phonics package to beginning readers. It was also recommended among other things that curriculum designers should work in collaboration with English Language textbook writers to incorporate synthetic phonics activities into the primary school's literacy programmes.*

Keywords**:** synthetic phonics, literacy skills, phonemic awareness, word formation.

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Introduction

The importance of literacy to a school child during and after school, and indeed to the society, cannot be overemphasized. Literacy is the foundation of knowledge. Hence, adequate investment in literacy facilitates the achievement of most educational goals which translates into socio-economic and political development. This explains whyZua (2021) observes that countries with high literate individuals are more likely to be democratic and politically stable than those without literacy.

Literacy has been defined as the ability to read and write as well as the ability of an individual to identify and understand printed materials. It is a way of processing information which affects ways of interaction and reasoning (Bainbridge, 2019). Thus, it is a veritable skill for accessing information, creating knowledge, promoting enquiry and active participation in classroom lessons. Literacy goes beyond reading and writing. It embraces logical action and thinking including being conscious of surrounding events; it is also the acquisition of basic communication skills in a way that permits the individual to extend the range of his contact beyond his immediate environment.

In the early years, oral language, reading and writing are taught both separately and together. Sometimes there are formal lessons that can be easily recognised as literacy learning. At other times, literacy skills and knowledge are incorporated into games, singing and play activities. Pupils may not recognise these as literacy learning but they all play an important part in teaching the skills and knowledge needed to become literate. The learning that occurs in other subject areas such as mathematics and science also includes aspects of literacy instruction that are specific to those subjects (Hub, 2022).

Reading is an important literacy skill. It has been considered as the most important skill for young learners as it is one of the important sources for language input (Edger, 2017; Atwell, 2018). Moreover, any child who does not learn to read early and will not easily master other skills and knowledge, and is unlikely to make progress in school or in life. Regrettably, most Nigerian primary school pupils, especially those in public schools lack basic phonics literacy skills. At the beginning of the fourth year of school, many of them find it difficult to read and write in English (Stuart, 2021).

In Katagum Local Government Area of Bauchi State, the number of pupils with difficulties in reading is alarmingly high; majority of primary school pupils are unable to read, communicate or write in English. The researchers further observed that there are several reasons for the low achievement rate of pupils' literacy skills in most of the primary schools in, Nigeria which include poor preparation of teachers, lack of continuous training and refresher course for teachers, lack of variation in approach to teaching, absence of instructional materials and insufficient guidance for teachers among other factors. Essentially to this observation is Gambaki, Ibrahim and Ali's finding (2018) that teachers in the area have continued to shy away from utilizing the modern instructional materials in the teaching and learning of English language. However, these researchers are hopeful that if an activity-based strategy like phonics is adopted, pupils' literacy skills will develop significantly. It was against this backdrop that this study investigated the effects of synthetic phonics strategy on primary four pupils' literacy skills in Katagum LGA, Bauchi State, Nigeria.

Synthetic phonics, also known as blended phonics, jolly phonics or inductive phonics is a method of teaching reading which first teaches the letter sounds and then builds up to blending sounds together to achieve full pronunciation of whole word (Henbest & Apel, 2017; Akoko, 2020). Fletcher (2017) refers to it as a family of programmes which aim to teach literacy through teaching pupils the correspondence between grapheme and phonemes, read words by blending: identifying the grapheme in the word, recalling the corresponding phonemes and saying the phonemes together to form the sound of the whole word. It is also teaching students to write words by segmenting: identifying the phonemes of the word, recalling the corresponding grapheme and writing the grapheme together to form the written word. According to John (2018) synthetic phonics programmes have some or all the following characteristics: teaching grapheme-phoneme correspondence out of alphabetical

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order, following an order determined by perceived complexity (going from easiest to hardest to learn).

In synthetic phonics, words are broken up into the smallest units of sound (phonemes). Children learn to make connections between the letters of written texts (grapheme, or letter symbols) and the sounds of spoken language. Synthetic phonics also teaches children how to identify all the phonemes in a word and match them to a letter in order to be able to spell correctly. Children are taught how to break up words, or decode them, into individual sounds, and then blend all the way through the word. The 'synthetic' part of this particular phonics instruction derives from the process of synthesizing or blending sounds to create words (Atham, 2012). According to Goswami and Ziegler(2016), new sounds are introduced in alphabetical order, and they are introduced quickly. Synthetic phonics holds that children are able to read a range of easily decodable words sooner, this means that if a pupil is introduced to the sounds /m/ /s/ /a/ /t/ such a child can quickly read the words, such as, at, mat, sat, am, sam. Therefore, synthetic phonics is a more accelerated from of phonics. Children are taught letter sounds when they start school, before they learn to read and even before they are introduced to books.

Empirical Review

Numerous studies have been conducted to determine the effects of synthetic phonics on achievement in literacy skills. On the international scene, Thaen-Nga and Leenam (2016) examined the use of phonics instruction to enhance students' reading ability in Nam Yuen District, Ubon Ratchathani Provincems, Jidanan. The sample consisted 30 Grade 3 students drawn from the population of all the Grade 3 pupils in Nam Yuen district in the second semester of academic year 2015. Simple random sampling technique was adopted for the selection of the sample. Quasi-experimental research design was used for the study. An achievement test was utilised as instrument for data collection. The data collected were analysed using the Statistical Package for Social Sciences (SPSS) to find mean (x), standard deviation (S.D.), and dependent t-test. The results revealed that phonics is an effective tool for improving students' reading ability. Therefore, it was recommended among other things that students should practise oral reading using phonics technique as often as possible to boost their learning competence.

The reviewed study and the current study are related in their common concern with the use of synthetic phonics to improve achievement in reading.The gaps the current study fills are in the aspects of location, population, sample, and method of data analysis. Whereas the previous study was conducted at Nam Yuen School, Nam Yuen District, Ubon Ratchathani Provincems, Jidanan, the current study was conducted in Katagum LGA of Bauchi State, Nigeria, to bridge the gap in location. Secondly, the reviewed study adopted the population of Grade 3 pupils, while the current study used the population of primary 2 pupils. Also, while the reviewed study selected only 30 participants, the current study drew the total sample of 120 pupils.Lastly, the reviewed study used t-test for data analysis, whereas Analysis of Co-variance (ANCOVA) was used in this study.

In Nigeria, Amadi and Offorma (2020) studied the effects of synthetic phonics instruction on English as second language learners' interest in reading in Enugu East LGA of Enugu State, Nigeria. The study adopted the non-equivalent, non-randomized control group quasi-experimental research design. The sample of the study consists of 118 primary one school pupils drawn from the population of four public primary schools in Enugu, Nigeria through multi-stage sampling technique. Data were collected using Reading Interest Inventory (RII). The collected data were analysed using means, standard deviation to answer the research questions and Analysis of Covariance (ANCOVA)to test the hypotheses at 0.05 alpha level. The results revealed that synthetic phonics was effective in enhancing pupils' interest and ability in reading. It was therefore recommended that learners should be properly exposed to learning activities and methods such as synthetic phonics that can ignite and sustain their interest in reading.

The reviewed study is related to the current study in the sense it investigated the effects of

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synthetics. However, the study was limited to Enugu State and did not consider other states, hence the current study which was conducted in Bauchi State fills the gap existing in location.The reviewed study used 118 pupils as sample, while the present study used 120 pupils, thus fill the gap in sample size. In addition, the reviewed study employed Reading Interest Inventory (RII) as instrument for data collection, whereas the present study utilised Word Reading Achievement Test (WRAT) and Word Spelling Achievement Test (WSAT) for this purpose.

Purpose Of The Study

This purpose of this study was to investigated the effects of synthetic phonics strategy on primary school pupils' achievement in literacy skills in Katagum Local Government Area of Bauchi State, Nigeria. The specific objectives were to:

1. determine the pre-test and post-test achievement mean score of primary four pupils in phonemic awareness in the experimental and control groups;
2. ascertain the pre-test and post-test achievement mean score of primary four pupils in letter formation in the experimental and control groups.

Research Questions

The following research questions guided the study:

3. What is the pre-test and post-test achievement mean score of **primary four** pupils in phonemic awareness in the experimental and control groups?
4. What is the pre-test and post-test achievement mean score of primary four pupils in letter formation in the experimental and control groups?

Hypotheses

The following null hypotheses were tested at 0.05 level of significance in this study:

1. There is no significant difference in the post-test achievement mean scores of **primary four** pupils in experimental and control group in phonemic awareness.
2. There is no significant difference in the post-test achievement mean scores of **primary four** pupils in letter formation in the experimental and control groups.

Methodology

The study adopted the pre-test and post-test quasi-experimental research design of non-equivalent groups. This design was adopted because the researchers used intact classes as the school authority did not permit them to randomize. According to Thomas (2024), this design is a useful in situations where true experiments cannot be used for ethical or practical reasons.The design compared two groups (experimental and control) to ascertain the effects of the treatment. The two groups were pre-tested, then the experimental group was exposed to instruction on synthetic phonics as the treatment package, while the treatment was withheld from the control group.

The population of the study comprised all the primary four pupils in the 10 primary schools in Katagum LGA numbering 831 for 2023 academic session. The sample consisted 120 pupils from two primary schools in Katagum LGA selected using simple random sampling technique. The sample size for experimental group was 34 pupils, while the control group was made up of 30 pupils. The researchers randomly selected the schools and assigned them to the instructional groups in intact classes. School A was assigned to the experimental group, while School B was assigned to the control group.

The instruments for data collection were Word Reading Achievement Test (WRAT), and Word Spelling Achievement Test (WSAT) developed by the researchers to test students' achievement in composition writing. WRAT consisted one section which sought information on pupils' word reading skills. It was made up of 15 items and was based on primary four curriculums on the aspect of reading comprehension in what pupils have been taught in their previous terms. WSAP was also made up of one section which as well sought information on pupils' word spelling achievement ability. The items were 10 and were equally selected from primary four curriculums in aspect of word spelling.

The two instruments (WRAT and WSAT)

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were subjected to face and content validity using experts in English Education and Research Measurement and Evaluation Units in the University of Jos. The reliability of the WRAT and WSAT was established using Kuder-Richardson formula 20 (kR – 20), since the items could be scored correct and incorrect. The instruments were administered once and the scores obtained were used to establish the reliability. The reliability coefficient was guided by the recommendations of Awotundeand Ugodulunwa (2004) who are of the view that reliability value of 0.7 and above is considered suitable and reliable.

The researchers further prepared a marking scheme which was used for the scoring of the items in the instrument. WRAT was scored by allocating 4 marks to each correct answer for the 15 items to give a total of 60 marks, while WSAT was scored by allocating 4 marks to each of the correct answer for the 10 items to give a total of 40 marks. The total mark for the two instruments was 100 marks. The pass mark was pegged at 40%.

The study was conducted with the aid of research assistants engaged and trained for that purpose. The researchers trained the two research assistants who were English Language teachers in the two selected schools. The research assistants possessed B. A. Ed and B.Ed in English Language Education. The English Language teacher for the experimental group was exposed to training for three days by the researchers on how to use the synthetic phonics strategy to teach pupils, but the teacher of the control group was asked to teach using the conventional/tradition method.

The research assistants taught the pupils for 8 weeks in their various classes which were monitored by the researchers to ensure the teachers do the right thing. The lesson lasted for 30 minutes each period. For the control group, the teacher taught them using conventional methods of teaching – that is, treatment was not given to the pupils. The intervention period took 8 weeks which was 3 times a week. The lesson plan contained clearly specified objectives under phonics teacher's and pupils' activities. They contained clearly specified teacher's activities with the corresponding pupils' activities and the duration. The researchers and the research assistants were responsible for the treatment using the model lesson plan prepared by the researchers. The experimental group were taught using synthetic phonics strategy, and the control group were taught using the conventional method. The research assistants taught phonemic awareness from Week 1 to 3, and letter formation from Week 4 to Week 6.

The WRAT and WSAT were administered as pre-test to both the experimental and control groups at the commencement of the teaching by the researcher and research assistants. The pre-test was given to determine the equivalence of the experimental and control groups before giving the treatment. After the test, the scripts were retrieved from the students and marking was done with the help of the research assistants. The scripts were kept till the post-test was administered to be able to compare the two results and determine if there was any difference in the post-test as a result of the treatment. Like the pre-test, post-test was WRAT and WSAT for both the experimental and control groups at the end of the sixth week of the treatment. There was no difference in the item in the post-test. The test was marked using the marking guide developed by the researchers.

The descriptive and inferential statistical tool was used to answer the research questions raised and test the null hypotheses at 0.05 level of significance. Both research questions were answered using mean and standard deviation, while the hypotheses were tested using Analysis of Covariance (ANCOVA). The choice of ANCOVA was to take care of errors of initial difference between groups. The pre-test scores were used as covariates to the post-test scores.

Results

The data collected were analysed and interpreted based on the two research questions and the two corresponding null hypotheses formulated.

Research Question One

What is the pre-test and post-test achievement mean score of primary four pupils in phonemic awareness in the experimental and control groups?

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Table 1: Pre-test and Post-test Mean Achievement Scores of Pupils in Phonemic Awareness in the Experimental and Control Groups

Group		Pre-test		Post-test		Mean Gain	Mean Difference
	N	Mean	SD	Mean	SD		
Experimental	34	29.00	4.844	63.03	9.436	34.03	13.96
Control	30	24.30	7.319	44.37	13.463	20.07	

Table 1 reveals the mean and standard deviation results of the pre-test and post-test mean achievement scores of primary four pupils in phonemic awareness in the experimental and control groups. The result for the experimental group shows that the pre-test mean score is 29.00 with a standard deviation of 4.84, while the post-test mean score is 63.03 higher than the pre-test mean score with a mean gain of 34.03, indicating that there was improvement in the achievement of pupils in phonemic awareness after treatment. Also, for the control group, the mean score was 24.30 with a standard deviation of 7.32 at the pretest. However, in the post-test, the mean score was 44.37 with a standard deviation of 13.46 and a mean gain of 20.07. The findings show that pupils in the experimental group had a higher achievement mean score (63.03) after treatment using synthetic phonics strategy as against those in the control group (44.37) who were not given treatment, with a mean difference of 13.96. This implies that the synthetic phonics strategy does increase pupils' achievement in phonemic awareness.

Research Question Two

What is the pre-test and post-test achievement mean score of primary four pupils in letter formation in the experimental and control groups?

Table 2: Pre-test and Post-test Mean Achievement Scores of Pupils in Letter Formation in the Experimental and Control Groups

Group		Pre-test		Post-test		Mean Gain	Mean Difference
	N	Mean	SD	Mean	SD		
Experimental	34	37.52	2.13	72.71	9.74	35.19	9.07
Control	30	21.64	7.60	47.76	14.88	26.12	

Table 2 reveals the mean and standard deviation results of the pre-test and post-test mean achievement scores of primary four pupils in letter formation in the experimental and control groups. The result for the experimental group shows that the pre-test mean score is 37.52 with a standard deviation of 2.13, while the post-test mean score is 72.71 higher than the pre-test mean score with a mean gain of 35.19, indicating that there was improvement in the achievement of pupils in letter formation after treatment. Also, for the control group, the mean score was 21.64 with a standard deviation of 7.60 at the pretest. However, in the post-test, the mean score was 47.76 with a standard deviation of 14.88 and a mean gain of 26.12. The findings show that pupils in the experimental group had a higher achievement mean score (72.71) after treatment using synthetic phonics strategy as against those in the control group (47.76) who were not given treatment, with a mean difference of 9.07. This implies that the synthetic phonics strategy does increase pupils' achievement in letter formation.

Hypothesis One

There is no significant difference in the post-test achievement mean score of primary four pupils in experimental and control group in phonemic awareness.

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Table 3: ANCOVA Result on Posttest Achievement Mean Scores of Experimental and Control Groups

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	5614.372[a]	2	2807.186	20.327	.000	.400
Intercept	8074.823	1	8074.823	58.471	.000	.489
Pre-test	47.155	1	47.155	.341	.561	.006
Group	4523.229	1	4523.229	32.753	.000	.349
Error	8424.046	61	138.099			
Total	196602.343	64				
Corrected Total	14038.418	63				

a. R Squared = 400 (Adjusted R Squared = .380)

Analysis of Covariance (ANCOVA) was conducted to determine if a significant difference exists in the posttest achievement mean score of primary four pupils in experimental and control group in phonemic awareness. Table 8shows that $F(1,61) = 32.75$, $p < 0.05$, since the p-value of 0.000 is less than 0.05 level of significance, the null hypothesis was rejected, indicating that there was a significant effect of synthetic phonics strategy on pupils achievement in phonemic awareness. The result further reveals an adjusted R squared value of .380 which means that 38 percent of the variation in the dependent variable which is achievement in phonemic awareness is explained by variation in the treatment of synthetic phonics strategy, while the remaining is due to other factors not included in this study. This implies that synthetic phonics strategy can help improve pupils' achievement in phonemic awareness.

Hypothesis Two

There is no significant difference in the post-test achievement mean score of primary four pupils in letter formation in the experimental and control groups

Table 4: ANCOVA Result on Posttest Achievement Mean Scores of Experimental and Control Groups

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	10886.160[a]	2	5443.080	36.895	.000	.547
Intercept	14195.421	1	14195.421	96.220	.000	.612
Pre-test	935.620	1	935.620	6.342	.014	.094
Group	6776.484	1	6776.484	45.933	.000	.430
Error	8999.362	61	147.531			
Total	249094.266	64				
Corrected Total	19885.522	63				

a. R Squared = 547 (Adjusted R Squared = .533)

Analysis of Covariance (ANCOVA) was conducted to determine if a significant difference exists in the posttest achievement mean score of **primary four** pupils in experimental and control group in letter formation. Table 9 shows that $F(1,61) = 45.93$, $p < 0.05$, since the p-value of 0.000 is less than 0.05 level of significance, the null hypothesis was rejected, indicating that there

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was a significant effect of synthetic phonics strategy on pupils' achievement in letter formation. The result further reveals an adjusted R squared value of .533 which means that 53.3 percent of the variation in the dependent variable which is achievement in letter formation is explained by variation in the treatment of synthetic phonics strategy, while the remaining is due to other factors not included in this study. This implies that synthetic phonics strategy can help improve pupils' achievement in letter formation.

Discussion

The discussion of findings in this study was based on the analysis and interpretation of the five research questions raised and five null hypotheses formulated. The discussion cut across students' achievement in phonemic awareness and letter formation.

The finding revealed that there was a significant effect of synthetic phonics strategy on pupils' achievement in phonemic awareness. This is because synthetic phonics teaches children to identify all the phonemes in a word and match them to a letter in order to be able to spell correctly. Thus, children learn to make connections between the letters of written texts (graphemes, or letter symbols) and the sounds of spoken language. This finding is in agreement with Thaen-Nga and Leenam (2016) whose finding revealed that synthetic phonics enhanced phonemic awareness and reading ability in general. This implies that the synthetic approach to reading instruction is an effective strategy for teaching phonemic awareness and for developing beginning reading ability.

Furthermore, the finding revealed that synthetic phonics strategy significantly improved pupils' achievement in letter formation. This is because children are taught how to break up words, or decode them, into individual sounds, and then blend all the way through the word.The combined activities stimulate their interest for improved achievement This aligns withAmadi and Offorma's report (2020) that synthetic phonics was effective in enhancing pupils' interest for better reading and spelling among other literacy skills. This as well implies that synthetic phonics is an effective instructional strategy for developing letter formation and improving reading and writing.

Conclusion

Based on the findings of this study, it was concluded that synthetic phonics is a learner-centred instructional strategy that develops beginning readers' phonemic awareness. It was also concluded that it is an effective language instruction for enhancing pupils' letter formation ability. Therefore, if the strategy is adopted by the English Language teacher, pupils' literacy skills will improve significantly.

Recommendations

Based on the findings of this study, it is recommended that:

1. Teachers of English should prioritise the use of synthetic phonics package to improve pupils' reading ability.
2. Pupils should participate in the activities of synthetic phonics for improved literacy development.
3. Government should orgamise seminars and workshops for the retraining of English Language teachers on the use of synthetic phonics programmes to develop pupils' literacy skills.
4. Curriculum designers should work in collaboration with English Language textbook writers to incorporate synthetic phonics activities into the primary school's literacy programmes.
5. Teacher education programmes should be redesigned to incorporate a research-proven instructional package like synthetic phonics to enable prospective teachers of English acquire phonics skills for classroom application.
6. School administrators such as the principals should supervise English Language teachers to ensure that they apply synthetic phonics strategy in their reading lesson.
7. Parents or guardians who are interested in the literacy development of their children or wards should patronise schools where synthetic phonics is adopted for developing pupils' literacy skills.

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