Effect of Activity Based Learning Models On Literacy Skill Development Among Preschoolers With Attention Deficit Hyperactivity Disorder In Rivers East Senatorial District

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ABSTRACT
This study investigated the effect of synthetic phonics and role play activity based learning models on the literacy skills development of preschoolers with ADHD in public childcare centers in Rivers State. The quasi-experimental research design was adopted for the study. The population of this study will be all the 1,030 nursery three preschoolers in 232 public early childcare centres in Obio/Akpor Local Government Area which was purposively drawn from the 23 LGAs of Rivers State. A total of 95 preschooler participated in the diagnoses process of the study while only 25 preschoolers who were diagnosed with ADHD took part in the actual study. Two research questions and two hypotheses were answered and tested at 0.05 level of significance. Two validated instruments titled “SNAP IV” and “EGRA/BURT” were used for the study. The reliability of the instruments were established using Cronbach’s alpha and Kuder-Richardson (KR-21) models to obtain reliability index of 0.69 and 0.73 for SANP IV and EGRA/BURT respectively. Mean with standard deviation was used to answer the research questions, while the hypotheses were tested using analysis of covariance (ANCOVA). Findings established that there is a significant difference in the mean effect of synthetic phonics and role play activity based learning models on the literacy skills development of preschoolers with ADHD in public childcare centers in Rivers State, when compared to those taught with lecture method. It was recommended among others that the use of Synthetic phonics instructional strategy should be encouraged across early childhood centers for the purpose of enhancing literacy skills development.

Keywords: Activity-Based Learning, Literacy-Skill, Preschoolers, ADHD, Synthetic Phonics (Jolly Phonics)

INTRODUCTION
In early years education it is important that preschoolers acquire some skills such as language and literacy which aids them in their development and also these skills will aid them in smooth transition to elementary school. Realistically, not all preschoolers acquire these skills before they transit to elementary school. This could be as a result of a child’s inattention, hyperactivity and impulsivity and practitioner’s inability to use a proper instruction on these preschoolers. Practitioners or caregivers as the case may be, need to understand best strategies for the successful instruction of literacy skill to preschoolers with Attention Deficit, Hyperactivity Disorder (ADHD). Preschoolers with ADHD hardly acquire the necessary literacy skill because of the type of instructional strategies their caregivers employ in teaching them, making it difficult for these preschoolers with ADHD not to pay adequate attention and develop early reading, writing and oral language skill which prepares them for the future ahead. This is because of difficulties in attention span/capacity and these makes them not to benefit from the valuable lessons of preschool, which also aid their academic performance (Spira, and Fischel 2005).
Due to ADHD prevalence, it is most likely that caregivers will have at least two children or preschoolers...
with ADHD in their classroom each academic year. When selecting and implementing activity-based instruction that will aid the children with ADHD in their literacy skill development, it is pertinent that the caregivers know the characteristics of these preschoolers so as to choose instruction that will be appropriate for the child. Early years practitioners who successfully educate children with ADHD always begins identifying the unique needs of these preschoolers, after which the practitioners/caregiver selects best appropriate instructional practice and then combines these practices into individualized educational programme or integrate these practices with educational activities provided to other preschoolers in the classroom so as to meet their learning needs/styles.

Activity-based learning (ABL) models have been identified as one of the best instructional method that has the potential of enhancing the development of literacy skill of preschoolers with ADHD. This is because ABL has the capacity to make the preschoolers pay detailed attention and concentration on the task at hand since preschoolers are made to engage in one form of learning activity or the other. It ensures that the preschoolers are active and not passive learners. They are made to initiate and complete tasks with the supervision of the caregivers. Activity-based learning or ABL describes a range of pedagogical approaches to teaching. Its core premises include the requirement that learning should be based on doing some hands-on experiments and activities. If children are provided the opportunity to explore on their own and provided an optimum learning environment then the learning becomes joyful and long-lasting. Understanding activity-based learning is significant for creating the appropriate social environment; however, in conjunction with this knowledge, the physical environment must be well-thought-out to support the transactions that are intended to take place. According to Lippman, (2016), activity-based learning occurs when: knowledge is mutually constructed with others; learning is collaborative and co-constructed between the learner and his or her social environment. This study will be focusing on the activity-based learning model of Synthetic Jolly Phonics and Role play instructional strategies.

Synthetic phonics which is also known as blended phonics or inductive phonics is a method of teaching reading by first teaching the letter sounds and then build up to blending these sounds together to achieve full pronunciation of whole words. Synthetic phonics is referred to a family of programs which aim to teach literacy by: teaching students the correspondence between letter sound; teaching students to read words by blending; identifying the letter sounds in the word, recalling the corresponding letter sounds, and putting the letter sounds together to form the whole word; Teaching students to write words by segmenting(sounding): identifying the letter sounds in a word, recalling the corresponding letter sound, then writing the sounds together to form the written word.

Role-play is a technique that allows preschoolers to explore realistic situations by interacting with other people in a managed way in order to develop experience and try different strategies in a supported environment. Depending on the intention of the activity, participants might be playing a role similar to their own or could play the opposite part of the conversation or interaction. Both options provide the possibility of significant learning, with the former allowing experience to be gained and the latter encouraging the student to develop an understanding of the situation from the ‘opposite’ point of view.

Statement of the Problem

This research emanated as a result of the experience the researcher had with preschoolers that exhibited some behavioral symptoms of ADHD learning disorder in a public childcare Centre. These preschoolers seem not to follow on the literacy instruction given to them by their caregivers and it seemed that attention was not given to these preschoolers by the caregivers because of their hyper activity and low attention span. These children always have difficulties sitting at a place and always find it difficult focusing on a given task/activity for a long period of time which is necessary prerequisite required for children to attain educational milestone later in life. Their caregivers always have hard time and they ought to face difficulties trying to get the best literacy instruction suitable for this group of preschoolers that will aid them in the development of their literacy skill. Studies have shown that children who have been diagnosed with ADHD tends to more likely drop out of school or have fewer years of education and experience academic failure (Centre for ADHD Awareness Canada, 2014). Studies have also shown that 25% of preschoolers with ADHD also have learning disability that makes it difficult for these children to attain academic success in the future.
This is a major problem because children who have difficulty in reading and writing tend not to be successful in improving and are more likely to continue experiencing academic failure and problem related to low self-esteem and feeling of isolation. With a seeming limited study in this regard in Rivers East Senatorial District of Rivers State, this study is thus set to investigate the effect of synthetic phonics and role play activity-based models on the literacy skill development of preschoolers with ADHD.

**Purpose of the study**
The main purpose of the study is to investigate the effect of Activity-based Learning models on the literacy skills development of preschoolers with ADHD in public childcare centers in Rivers State. The study will specifically look to:
- Determine the literacy skills development of ADHD preschoolers taught with synthetic phonics model as compared to those taught with analytical method
- Examine the literacy skills development of ADHD preschoolers taught with role play model as compared to those taught with analytical method

**Research Questions**
The following research questions were formulated to guide this study:
1. What effect does synthetic phonics model have on the literacy skills development of ADHD preschoolers as compared to analytical method?
2. What is the effect of role play model on the literacy skills development of ADHD preschoolers as compared to analytical method?

**Hypotheses**
The following research hypotheses were formed to guide this study:

**H01:** There is no significant difference in the mean effect of literacy skills development of ADHD preschoolers taught with synthetic phonics model as compared to those taught with analytical method?

**H02:** The mean effect of literacy skills development of ADHD preschoolers taught with role play model as compared to those taught with analytical method do not differ significantly.

**Theoretical and Empirical Review**

**Constructionism Theory Seymour Papert 1984**

Constructionism as a theory of instruction was championed by Seymour Papert based upon the theory of constructivism developed by the Swiss psychologist Jean Piaget, (1896-1980). Seymour Papert worked with Jean Piaget in Geneva between 1958 and 1963. The theory of constructionism posits that learning occurs especially well when learners are engaged in constructing a meaningful product, such as a machine, a poem, a story, a computer program or a song. Consequently, constructionism consists of two types of construction: As a by-product of the construction of things out in the world, learners simultaneously construct knowledge or mental models inside their heads. This novel knowledge then enables them to build even more complex objects physically, which gives rise to more knowledge and so on, in a self-reinforcing cycle (Harel & Papert, 1991). This was evident when the proponent of the theory engaged students in mathematical knowledge while instructing them on how to write computer programs for the teaching of some concepts in mathematics. By actively engaging the students with the computer aided learning, it was observed that learning through computer-aided knowledge shared some similarities with the Piaget (1977) mental mapping processes of constructing and supplementing knowledge structures in the mind’s eye of the learner. Constructionism has been found to be effective in the improvement of learning outcomes (Harel & Papert, 1991; Kafai, Desai, Peppler, Chiu, & Moya, 2008). The theory of constructionism is affixed on the premise of learning by making palpable things through students’ construction of artifacts of projects related to the knowledge base (Harel & Papert, 1991). Examples of constructionist instructional strategies are activity-based learning, project-based learning, learning while doing, design-based learning, role playing, synthetic phonics, Math by design, open education, child-centered education and informal learning among others. However, Piaget and Papert agree over the active construction of knowledge by the learner, therefore education consists of the
provision of opportunities for learners to engage in creative activities that catalyze this constructive process. Attention is focused on the learners. The students are guided to improve in knowledge through active learning engagement, exploration, creative design and reflection.

Contemporary research on effective teaching focuses on instruction that promotes pupil’s involvement and activity. The new instructional pedagogy requires teachers to move away from lecturing and move towards activity-based learning. Most teachers in the school system often teach by the “telling method”. This involves making lesson notes, passing on the information to the pupils and then evaluating the pupils. The teacher becomes very “active” while the pupils are very “passive”. This does not lead to a lasting learning on the part of the pupils. Pupils do not easily understand and comprehend the lessons taught. This makes pupils to forget the lessons taught and therefore perform poorly in the examinations. Active learning implies the strategies where the pupils touch, feel, participate, discover, reason, deduce and infer facts and ideas in the learning process.

**Constructivism Theory by Jean Piaget (1896-1980)**

The Jean Piaget theory of learning constructivism suggests that learning occurs when learners construct knowledge through active involvement in the learning process (Major and Mangope, 2012). All new knowledge is constructed from a base of prior knowledge (experiences). Since constructivism is based on reflection and transfers of knowledge to new situation, both groups of students adopting the phonics model and the role play model will be made to get involved in activities that could help to enhance their flexibility in problem-solving, critical thinking, transfer of skills, and the application of knowledge in new situations like in the development or development of literacy skills. The theory and the study hold the view that knowledge can be developed by engaging in activity-based learning. The objectives of the lesson are formed from the strategic components of each of the models adopted.

There are mixed findings of different researches about the effectiveness of ABL. Suydan, Marilyn and Higgins (1977) reached on the conclusion that ABL in elementary mathematics is more effective than traditional method of teaching. Active engagement in learning activities develops conceptual understanding and motivates students to seek further information (Brophy, 1995).

**METHODOLOGY**

This study investigated the effect of activity-based learning like synthetic phonics and role play on the development of literacy skills among preschoolers with ADHD. This study adopted the quasi-experimental design. Quasi-experimental study according to Nwankwo (2013) and Maduabum, (2007) as cited in Kayii and Dambo (2018) is a “study in which some threats to the validity cannot be properly controlled because of unavoidable situation associated with the study when human beings are used for experimental study”. The quasi experimental design was selected with the aim of establishing the possible effect of the activity-based instructional model of synthetic phonics and role play in enhancing the literacy skill development of preschoolers with ADHD. The pretest post-test quasi experimental was chosen because intact classes were used since it was not possible to have a complete randomization of the preschoolers to avoid disorganizing the various classes in the childcare centers.

1,030 nursery three (3) preschool children from all the 232 public child care centers in Obio/Akpor Local Government Area of Rivers State constituted the population for the study. The population comprise of 514 male preschoolers and 516 female preschoolers. (Rivers state Universal Basic Education Board, 2018). The nursery three preschoolers were specifically chosen because they could comfortably understand the synthetic phonics and role play instructions. The sample size of 95 nursery three preschoolers was purposively determined, which represents about 9.2% percent of the entire population of the study. The study made use of 3 intact nursery three classes with two classes serving as the experimental class while one served as the control class. The intact class for synthetic jolly phonic had 35 preschoolers, that for role play method 35 and the analytical method had 30 preschoolers each.

The instruments used for the data collection in this study were the SNAP IV and the EGRA/BURT test. The SNAP IV instrument was used for determining the preschoolers with ADHD while the EGRA/BURT test was used to measure the learning achievement in literacy skill development. The SNAP IV is a 26
items instrument with a four point scale in which the parents and caregivers of the preschoolers were required to state whether the disorders are VM=Very Much (4), QB=Quite a Bit (3), JL=Just a Little (2), NA=Not at All (1) on the perceived ADHD characteristics of the preschool children. Items 1-9 of the SNAP IV measured the inattention disorder of the preschoolers; 10-17 measured the hyperactivities/impulsivity disorder while 18-26 measured the opposition/defiance disorder. The instruments were validated by three experts and adjudged reliable with reliability coefficient of 0.73 and 0.69 when analysed using Kuder-Richardson (KR-21) and Cronbach’s alpha respectively. Data obtained were analyzed using mean for research questions and Analysis of covariance (ANCOVA) used to test the hypotheses at 0.05 level of significance.

RESULTS PRESENTATION
Research Question 1: What effect does synthetic phonics model have on the literacy skills development of ADHD preschoolers as compared to analytical method (lecture method)?
Table 1: Mean and standard deviation on the effect of synthetic phonics model on the literacy skills development of ADHD preschoolers as compared to analytical method (Lecture Method).

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Pretest Mean</th>
<th>SD</th>
<th>Posttest Mean</th>
<th>SD</th>
<th>Gain Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>SJP</td>
<td>10</td>
<td>36.30</td>
<td>8.08</td>
<td>77.30</td>
<td>9.41</td>
<td>41.00</td>
<td>6.11</td>
</tr>
<tr>
<td>LM</td>
<td>8</td>
<td>32.50</td>
<td>8.80</td>
<td>50.13</td>
<td>11.12</td>
<td>17.63</td>
<td>6.07</td>
</tr>
</tbody>
</table>

Table 1 shows the mean and standard deviation on the effect of synthetic phonics model on the literacy skills development of ADHD preschoolers as compared to analytical method. It shows that the ADHD preschoolers taught with Synthetic Jolly Phonic (SJP) had a mean literacy skill development of 41.00, SD=6.11 while those taught with Analytical method (LM) had a mean literacy development of 17.63, SD=6.07.

Research Question 2: What is the effect of role play model on the literacy skills development of ADHD preschoolers as compared to analytical method (lecture method)?
Table 2: Mean and standard deviation on the effect of role play model on the literacy skills development of ADHD preschoolers as compared to analytical method

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Pretest Mean</th>
<th>SD</th>
<th>Posttest Mean</th>
<th>SD</th>
<th>Gain Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>RPM</td>
<td>7</td>
<td>39.14</td>
<td>11.61</td>
<td>74.00</td>
<td>14.09</td>
<td>34.86</td>
<td>6.47</td>
</tr>
<tr>
<td>LM</td>
<td>8</td>
<td>32.50</td>
<td>8.80</td>
<td>50.13</td>
<td>11.12</td>
<td>17.63</td>
<td>6.07</td>
</tr>
</tbody>
</table>

Table 2 shows the mean and standard deviation on the effect of role play model on the literacy skills development of ADHD preschoolers as compared to analytical method. It shows that the ADHD preschoolers taught with Role Play Method (RPM) had a mean literacy skill development of 34.86, SD=6.47 while those taught with Analytical method (LM) had a mean literacy development of 17.63, SD=6.07.

H₀₁: There is no significant difference in the mean effect of literacy skills development of ADHD preschoolers taught with synthetic phonics model as compared to those taught with analytical method?
Table 3: Summary of ANCOVA on the difference in the mean effect of literacy skills development of ADHD preschoolers taught with synthetic phonics model as compared to those taught with analytical method

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>4350.114</td>
<td>2</td>
<td>2175.057</td>
<td>55.019</td>
<td>.000</td>
</tr>
<tr>
<td>Intercept</td>
<td>830.499</td>
<td>1</td>
<td>830.499</td>
<td>21.008</td>
<td>.000</td>
</tr>
<tr>
<td>PRETEST</td>
<td>1067.978</td>
<td>1</td>
<td>1067.978</td>
<td>27.015</td>
<td>.000</td>
</tr>
<tr>
<td>GROUP</td>
<td>2318.778</td>
<td>1</td>
<td>2318.778</td>
<td>58.654</td>
<td>.000</td>
</tr>
<tr>
<td>Error</td>
<td>592.997</td>
<td>15</td>
<td>39.533</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>8154.000</td>
<td>18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>4943.111</td>
<td>17</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. R Squared = .880 (Adjusted R Squared = .864)

Table 3 shows the summary of ANCOVA on the difference in the mean effect of literacy skills development of ADHD preschoolers taught with synthetic phonics model as compared to those taught with analytical method. The result of the F-statistic shows that there is a significant difference in the mean effect of literacy skills development of ADHD preschoolers taught with synthetic phonics model as compared to those taught with analytical method (F1, 15=58.654, p<.05). The null hypothesis was rejected at 0.05 alpha level.

H02: The mean effect of literacy skills development of ADHD preschoolers taught with role play model as compared to those taught with analytical method do not differ significantly.

Table 4. Summary of ANCOVA on the difference in the mean effect of literacy skills development of ADHD preschoolers taught with role play model as compared to those taught with analytical method

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
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<td>1841.702</td>
<td>44.066</td>
<td>.000</td>
</tr>
<tr>
<td>Intercept</td>
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<td>1</td>
<td>548.900</td>
<td>13.133</td>
<td>.003</td>
</tr>
<tr>
<td>PRETEST</td>
<td>1555.346</td>
<td>1</td>
<td>1555.346</td>
<td>37.215</td>
<td>.000</td>
</tr>
<tr>
<td>GROUP</td>
<td>933.252</td>
<td>1</td>
<td>933.252</td>
<td>22.330</td>
<td>.000</td>
</tr>
<tr>
<td>Error</td>
<td>501.529</td>
<td>12</td>
<td>41.794</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>60489.000</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Corrected Total</td>
<td>4184.933</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. R Squared = .880 (Adjusted R Squared = .860)

Table 4 shows the summary of ANCOVA on the difference in the mean effect of literacy skills development of ADHD preschoolers taught with role play model as compared to those taught with analytical method. The result of the F-statistic shows that the mean effect of literacy skills development of ADHD preschoolers taught with role play model as compared to those taught with analytical method does differ significantly (F1, 12=22.330, p<.05). The null hypothesis was rejected at 0.05 alpha level.

DISCUSSION OF FINDINGS

From hypothesis 2, the result shows the summary of ANCOVA on the difference in the mean effect of literacy skills development of ADHD preschoolers taught with synthetic phonics model as compared to those taught with analytical method. The result of the F-statistic shows that there is a significant difference in the mean effect of literacy skills development of ADHD preschoolers taught with synthetic
phonics model as compared to those taught with analytical method (F1, 15=58.654, p<.05). The null hypothesis was rejected at 0.05 alpha level. This result implied that the preschoolers who were taught with ABL model of synthetic phonics performed better than those taught with traditional analytical method of literacy instruction. This finding is consistent with that of Hake (1998) who compared Jolly Phonics and Big Book, one hour a day for 12 weeks with 5 year-old learners and found that the Jolly Phonics group was significantly ahead of the Big Book group in alphabetic knowledge, spelling, reading of words and non-words. Gallagher et al. (1992) noted remarkable improvement in the results of ABL students than their counterparts and viewed that ABL is an effective method of developing problem-solving processes and skills. Hake (1998) conducted a 9-month study using synthetic phonics as an intervention strategy in 5 schools. They reported a marked difference in the post-test scores of pupils in the experimental group. At the end of the study, pupils in the intervention made a gain of between 1 month and 31 months in their reading age while those in the control group “could not read any single word.

From hypothesis 2, the result shows the summary of ANCOVA on the difference in the mean effect of literacy skills development of ADHD preschoolers taught with role play model as compared to those taught with analytical method. The result of the F-statistic shows that the mean effect of literacy skills development of ADHD preschoolers taught with role play model as compared to those taught with analytical method does differ significantly (F1, 12=22.330, p<.05). The null hypothesis was rejected at 0.05 alpha level. This finding depicts that the ABL model role play method enhanced the learning ability of preschoolers with ADHD than those taught with the analytical method. The result is in agreement with that of Raynolds, (2013) who conducted a study on teaching children with ADHD using role play classroom strategies to engage the easily distracted. The result of the findings showed a significant difference in the mean performance of children taught using role play method of instruction and those taught using the analytical method. In another study, Brady (2006) studied on the power of role play for building social literacy skills of children with ADHD. The study found out that the hyperactivity and inattention levels of the children were drastically reduced as the children were so occupied with the task of playing out their assigned roles. Findings also reported a significant improvement in the overall literacy performance of children. The study proved a remarkable improvement in the speaking, writing and comprehension of the school children. Aram, Bazelet and Goldman, (2010) carried out a study on early literacy and parental writing mediation in young children with and without ADHD using role play method of instruction. The result shows that children with ADHD exhibited lower literacy achievement at age 5-6 years as compared to their peers without ADHD. There was however a significant literacy achievement improvement on the part of the children with ADHD after been subjected to the role play instructional method.

Conclusively, this study posits that there is a significant difference in the literacy skill development of ADHD preschooler taught using ABL models of synthetic Jolly phonics and role play instructional strategies as compared to the ADHD preschoolers taught using the analytical method.

**RECOMMENDATIONS**

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

1. The use of Synthetic phonics instructional strategy should be encouraged across early childhood centers for the purpose of enhancing literacy skills development
2. Schools should endeavour to make adequate provisions of phonics instructional materials and retrain teachers on the appropriate use of the teaching method

**REFERENCES**


Raynolds, L. (2013) Teaching children with ADHD: role play classroom strategies to engage the easily distracted
