The Effect of Metacognitive Skills on Performance in English Language among Senior Secondary School Students in Anambra State, Nigeria

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Abstract
The study investigated the effect of metacognitive skills on academic performance of senior secondary school students in Anambra state, Nigeria. The purpose of the study was to examine the relationship between metacognitive skills and academic performance among senior secondary school students. A sample of 144 participants’ were randomly selected from three senior secondary schools was used for the study. The schools were randomly assigned two intervention conditions (metacognitive training strategies) and control group. Questionnaire and achievement test was employed to generate data for the study. To guide the study, two research hypotheses were formulated. The hypotheses were tested using descriptive statistical method, analysis of covariance (ANCOVA) and Pearson product moment correlation coefficient statistics. The study revealed a positive relationship between metacognitive skills and academic performance such that developing metacognitive skills of a student will lead to the improvement of his/her academic performance in English Language. Thus, the need to inculcate the development of metacognitive skills in the school curriculum. This is considered important because of its impact in improving academic performance of students in English Language. The findings of the study may assist educators in developing instructional objectives for a better understanding of the effects of metacognitive skills on academic performance of senior secondary school students.

Keywords: metacognitive skills, academic performance, self awareness skills, planning skills and monitoring skills

INTRODUCTION
The importance of English Language acquisition for proficiency in other school subjects cannot be overemphasized. This is because there is hardly any school subject that the instructions are not written in English in Nigeria. This expertise in the English Language is very important and may guarantee success in other subjects. Acquiring sufficient knowledge of English language is important for educational, economical and national development of a nation. In recognition of the importance of English language for enhancing educational attainment as well as for improving communication ability of citizens, the subject has become a core subject in the school curriculum (Federal Government of Nigeria, 2004). For instance, as a prerequisite for university admission, it is compulsory for students to pass the English Language at credit level. This also explains why many parents are determined to see that their wards pass at credit level and above in English language.

However, one of the current educational concerns is that of under achievement in English language in public examinations (Kolawole 1998, Kolawole & Dele, 2002). One of the reasons often ascribed to this poor trend has been poor foundation in reading skills in English Language at the primary and secondary school levels, despite the fact that English Language is one major subject which demands and instills reading culture in students. The comprehension aspect of the language is one that is particularly designed for this purpose, such as ability to read and understand. Comprehension is an essential aspect of English Language in which students are required to do well before obtaining good grades in the subject as the other aspects of English language such as grammar, structure and composition, are all based on comprehension. However, it has been observed that students, even after given all the necessary pedagogical drills, still encounter some challenges in adequately treating English comprehension passages (Omoegun, 1983).

These challenges include: reading to learn, evaluation of understanding and ability to answer questions correctly. Students, who do not have sufficient working knowledge, are those that usually encounter these challenges. This working knowledge can be achieved through the teacher who teaches students to reflect on how they think, learn, remember, perform academic tasks and the teachers’ repeatedly emphasizing and demonstrating actions that illustrate how students can be responsible for and can control
their own outcomes in their everyday learning. Researchers such as Kuhn, (2000), Hartman, (2001) have suggested some fundamental ways to address this problem of comprehension through the use of metacognition.

Metacognition is one’s knowledge about the factors that affect cognitive activities which consists of both monitoring and regulation. Metacognition refers to the actual monitoring and consequent regulation and orchestration of these processes in relation to the cognition object or data on which they bear, usually in service of some concrete goal or objective (Flavell, 1979). Metacognition is any kind of cognitive transaction with the human or non-human environment, where a variety of information processing activities go on (Flavell, 1979). The distinction between cognitive and metacognitive knowledge may be in how the information is used, more than a fundamental difference in processes. Hacker (1998) also sees metacognition as the knowledge of one’s own cognitive and affective processes and states as well as the ability to consciously and deliberately monitor and regulate these processes and states.

Researchers such as Brown, Bransford, Ferrara, & Campione, (1983) emphasize different aspects of metacognition which refers to two distinct, but related issues: awareness and knowledge of self as learner, and conscious self-control and self-regulation of cognition. In essence, a metacognitive learner must understand his strengths and weaknesses in learning, and control how he will approach a problem. People tend to perceive barriers to student learning as lack of intelligence or motivation from teachers, when in reality, the student may lack awareness of the causes of the barriers he is facing. Metacognition involves students’ awareness and understanding of their learning skills, performance, preferences, barriers and goals. Metacognitive skills include taking conscious control of learning and selecting strategies (self-awareness), monitoring the progress of learning, correcting errors, analyzing the effectiveness of learning strategies (monitoring), and changing learning behaviours and strategies when necessary (planning).

In the context of reading, metacognition is the control executed by readers on their ability to understand a text, which involves what one is thinking about and what one is doing while reading. Reading successfully goes beyond fluency and word recognition but relies heavily upon comprehension of text. Upon encountering a reading task, one needs to first clarify the purposes of reading and understand what the task demands. Based on the information obtained in the first step, student plans for the task, by retrieving the relevant background information, setting up the goals of reading, and selecting proper strategies from his repertoire of reading strategies. In addition, during the process of reading, teachers and students must continuously monitor the ongoing activities to determine whether comprehension is occurring. A strategically competent reader continuously engages himself in self-questioning to determine whether comprehension and the goals are achieved; if not, he is able to revise the original plan and adopt compensatory actions to achieve comprehension (Xiao, 2005). This suggests that there are basic skills which are innate in the learner that have to be harnessed before comprehension takes place.

The metacognitive skills acquired in reading can promote the acquisition of language skills such as listening, speaking and writing. Some secondary school students find it difficult to read and understand despite the fact that reading is indispensable. Some show carefree attitude towards reading. Adewole (2001) asserts that the aim of any reading programme is to lay a strong foundation that can benefit pupils throughout their lives in academic pursuits. Reading successfully goes well beyond fluency and word recognition but relies heavily upon comprehension of text. Since reading is a meaning-making task, any behaviour used to enhance students’ understanding help in creating more effective reading. Therefore, students’ metacognitive skills could be enhanced through direct explicit instruction strategy.

One needs direct explicit instruction strategy in order to foster his metacognitive knowledge and skills (Xiao2005). Readers have the capacity to control the process of reading and this largely affects the ability to learn from text (Block, 2002). This control involves thinking about the actual process of reading. Awareness of metacognitive skills (self-awareness, monitoring and planning) can be gleaned through instruction such as the direct explicit instruction. The purpose of direct instruction is to provide explicit explanations on the notion and construct of metacognition so that students who used to be, most of the time, unaware of their own cognitive activities will become aware of their mental actions when they perform cognitive tasks. The direct explicit instruction strategy of metacognition should be regarded as a strategy that ‘provides learners with knowledge and confidence that enables them to manage their own learning and also empower them to be inquisitive in their pursuits’ (Paris & Winograd, 1990).

The metacognitive processes in reading are of two categories. The first is the knowledge about cognition. This involves knowledge of reading strategies which tend to remain constant irrespective of the situation. The second is the regulation of cognition. This encompasses the purpose of reading, the ease of difficulty of the text and perceived need.
for particular strategies. How successful a reader is will depend on his abilities, his knowledge and understanding of themselves as readers, their purposes and assessment of the reading task, and their knowledge of when and how to use reading strategies. Metacognitive skills provide overall plan to gain meaning from text.

While it appears that metacognitive skills are difficult to acquire, research has demonstrated that they can be taught and learnt in a classroom. What this suggests, therefore, is that metacognition can be viewed as an education-based model. As an education-based model, instructional strategies (the explicit instructions) can be used to improve metacognitive skills. This education-based model of metacognition can be incorporated in any classroom environment if the intent is to improve the academic, and career success of students in English Language. Intervention programme on metacognition using the explicit instruction can be adapted to improve poor academic performance. Brown, (1987) advocates that the task of educators is to acknowledge, cultivate, explore and enhance the metacognitive capabilities of all learners. Teachers can help their students learn from reading: they can encourage students to take an active role in reading. The goal is to develop active, independent learners.

STATEMENT OF PROBLEM
Students’ knowledge and belief regarding their study strategies has been a major source of concern to stakeholders in the education sector. Majority of the students do not have the ability of knowing the limits of their own learning and memory capabilities. They also lack the knowledge of what learning tasks they can realistically accomplish within a given period. The ability of knowing which learning strategies are effective, planning an approach to a learning task and using effective learning strategies to process and learn new materials seem to be lacking among the students. Worse still, their ability to monitor their own knowledge and the use of effective strategies for retrieval of previously stored information seem to be lacking whereas teachers’ expectation for students performance are always high.

The curricula at secondary school level seem not to be designed to address this inherent problem in spite of the observed importance of knowing which learning strategies are effective in determining comprehension skills and excellent performance in English Language. The more students know about effective learning strategies, the greater their metacognitive awareness and the higher their academic performance is likely to be. Students who use metacognitive strategies are likely to undergo conceptual change when such change is warranted. Unfortunately many students are unaware of how they can best learn and remember information (Ormrod, 2000).

Students can be helped to be successful learners if when teaching specific academic content (reading comprehension), they are made to learn how to develop and use effective learning strategies. However, the precise ways to improve the level of metacognition on academic performance so as to obtain optimal success is far from being achieved; as researchers have not carried out enough study on the effectiveness of explicit instruction on acquisition of metacognitive skills and performance in English Language. Basic metacognitive knowledge is seen as a prerequisite for the development of reading, writing and speaking (oral proficiency).

PURPOSE OF STUDY
The main purpose of the study was to determine the role of metacognitive skills in academic performance in English Language of senior secondary school students in Anambra State.

The aims to achieve include:
1. Examine if there is any difference in the post-test scores of English Language performance among participants in the experimental groups.
2. Establish whether there is any relationship between metacognitive skills and academic performance among participants in the experimental groups.

RESEARCH HYPOTHESES
1. There is no significant difference in the post-test scores in English Language performance of participants in the experimental groups.
2. There is no significant relationship between metacognitive skills and academic performance among participants in the experimental groups.

SIGNIFICANCE OF STUDY
This study would be relevant to policy makers and curriculum experts in the education sector, in that it will help to review our present educational policy and curriculum with the aim of introducing metacognitive skills as a core component of teaching reading comprehension in English language to improve learning abilities of students. The findings of this study would be of immense benefit to the teachers, students and educational researchers to enhance assessment in planning, instruction and conducting classroom research in the educational sector.

LIMITATIONS OF THE STUDY
The study was limited to public senior secondary school three (SS3) students of two Educational Zones randomly selected from Anambra state namely Zone 2 and 3. The variables considered were performance in English Language and metacognitive skills which
include self awareness, monitoring and planning skills.

**METHODOLOGY DESIGN**

The research designs used for this study was quasi experimental (pretest/posttest control group design). The quasi-experimental design was used in order to apply an experimental mode of analysis and interpretation to bodies of data not meeting the full requirements of experimental condition.

**Sample and Sampling Procedure**

Using the stratified random sampling technique, along class and gender lines, six intact classes were selected. A total of two hundred and forty-nine (249) students, (both male and female) were selected by simple random sampling for the baseline assessment of the study. Eighty-three participants were drawn from each of the 3 selected schools.

The base line assessment was done using the English Language achievement test, the State Metacognitive skills Inventory (SMI). The maximum score obtainable by participants were 100 in achievement test, & 100 in SMI. 144 participants scored below 50 in Achievement test, 50 in SMI (50% of the total scores on each instrument) respectively and hence deemed to have low level of metacognitive skills and academic achievement. These 144 participants consist of 52 participants in school 1; 51 participants in school 2, and 41 participants in school 3. Schools were randomly assigned to intervention conditions and the control group.

**Instrumentation**

The following instruments were used to obtain relevant data for this study.

1. English Language Achievement test.
2. State Metacognitive Inventory (SMI)

**English Language Achievement Test**

English Language Achievement Test was used to test the metacognitive awareness skills of students while reading text. This was adapted from past WAEC English Language papers which comprised a 100-item multiple choice objective test and comprehension passage was used for the achievement test.

**The State Metacognitive Inventory (SMI)** is a 20 item inventory instrument developed by O’Neil and Abedi (2000). It is a self-assessment questionnaire which measures metacognitive skills (planning, monitoring, control and self-awareness). The inventory has 3 sub scales which are:

- self-awareness skills,
- planning skills
- Monitoring skill

**Administration of the Instruments**

The intervention was carried out over a period of seven weeks. One week each was used for pre-test and post-test. The intervention consisted of Explicit instructions and Reading strategies. Participants in the two invention groups were exposed to one hour of training/discussion twice a week for 5 consecutive weeks. The control group did not receive any intervention procedure.

**Intervention**

It is believed that one needs explicit instruction in order to foster his metacognitive knowledge. Paris and Winograd (1990) emphasized the important role metacognition plays in academic learning and recommended that Direct Instruction is one effective classroom practice that would help students develop their metacognitive skills. The purpose of direct instruction is to provide explicit explanations on the notion and construct of metacognition, so that the students who used to be subconsciously aware of or most of the time were unaware of their own cognitive activities will be metacognitively aware of their mental actions when they perform cognitive tasks.

The sequence of instruction in the explicit instruction approach is a five phase recursive cycle for introducing, teaching, practicing, evaluating, and applying learning strategies. In this approach, highly explicit instruction in applying strategies to learning tasks is gradually faded so that students can begin to assume greater responsibility in selecting and applying appropriate learning strategies by following the five steps of the training model.

**Procedure for Data Analysis**

The two hypotheses were tested using descriptive statistical method, analysis of covariance (ANCOVA) and Pearson Products moment correlation coefficient statistics. The level of significance was determined at 0.05 level of significance.

**RESULTS**

Hypothesis One in the null form states that there is no significant difference in post test scores on performance in English Language of participants in the experimental groups. The data was analyzed using ANCOVA and the result of the analysis is as reported in Tables 1, 2, & 3.

<table>
<thead>
<tr>
<th>Table 1: Descriptive data on influence of experimental condition on English Language achievement among participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td>Explicit Instruction</td>
</tr>
<tr>
<td>Reading Strategy</td>
</tr>
<tr>
<td>Control</td>
</tr>
</tbody>
</table>

861
Table 1 shows that participants exposed to explicit instruction had the highest mean difference score of 18.77 followed by those exposed to reading strategies that had a mean difference score of 14.57 while the control group had the lowest mean difference score of 2.23. To determine whether significant difference in English Language achievement exist among participants analysis of covariance statistics was carried out. The result of the analysis of covariance is as presented in Table 2.

Table 2: Analysis of Covariance on Influence of experimental conditions on English language achievement among participants.

<table>
<thead>
<tr>
<th>Sources of Variation</th>
<th>Sum of squares</th>
<th>Degrees of Freedom</th>
<th>Mean of squares</th>
<th>F-ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main effect</td>
<td>7441.83</td>
<td>6</td>
<td>1240.31</td>
<td>32.43</td>
</tr>
<tr>
<td>Covariate</td>
<td>52.92</td>
<td>1</td>
<td>52.92</td>
<td>1.38</td>
</tr>
<tr>
<td>Experimental Conditions</td>
<td></td>
<td>2</td>
<td>414.08</td>
<td>10.83*</td>
</tr>
<tr>
<td>Within Group</td>
<td>52.39.61</td>
<td>140</td>
<td>37.42</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>13562.53</td>
<td>143</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*significant at 0.05; df=2 & 140; critical f= 3.06.

Evidence from table 2 shows that a calculated F-value of 10.83 resulted as the influence of experimental conditions on English language achievement among participants. Thus calculated F-value is significant since it is higher than the critical F-value of 3.06 given 2 and 140 degrees of freedom at 0.05 level of significance. The null hypothesis was consequently rejected.

Based on the significant F-value obtained, further analysis of data was done using Fisher’s protected t-test to do a pair wise comparison of group means in order to determine which group differs from the other in English language and the trend of difference. The result of the analysis is presented in table 3

Table 3: Fisher’s protected t-test on difference in English language achievement across experimental conditions.

<table>
<thead>
<tr>
<th>Group</th>
<th>Explicit Instruction</th>
<th>Reading strategies</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n=52</td>
<td>n=51</td>
<td>n=41</td>
</tr>
<tr>
<td>Explicit Instruction</td>
<td>59.42*</td>
<td>2.73*</td>
<td>12.84*</td>
</tr>
<tr>
<td>Reading strategies</td>
<td>3.30</td>
<td>56.12</td>
<td>10.17*</td>
</tr>
<tr>
<td>Control</td>
<td>16.34</td>
<td>13.04</td>
<td>43.08</td>
</tr>
</tbody>
</table>

* = Group means are in the diagonal; difference in group means are below the diagonal while protected t-test values are above the diagonal. *= significant at 0.05 level.

Table 3 shows that participants exposed to explicit instruction significantly have higher English language performance than those exposed to reading strategies (t=2.73; df=101; critical t= 2.00; P<0.05). Similarly participants exposed to explicit instruction significantly have higher English language achievement than those in the control group (t=12.84; df= 91; critical t=2.00; P<0.05). Again participants exposed to reading strategies significantly have higher English language achievement than those in the control group (t=10.17; df= 90; critical t= 2.00; P<0.05).

Hypothesis Two: There is no significant relationship between metacognitive skills and academic performance in English language among participants in the experimental groups.

Table 4: Correlation between Meta-cognition and Academic performance in English.

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>df</th>
<th>r-cal</th>
<th>r-tab</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Performance scores in English Language</td>
<td>144</td>
<td>14.93</td>
<td>142</td>
<td>0.862</td>
<td>0.159</td>
<td>Significant</td>
<td></td>
</tr>
<tr>
<td>Meta-cognition</td>
<td>144</td>
<td>57.50</td>
<td>15.24</td>
<td>&lt; P 0.05; df = 142; r-cal= 0.862 , r-critical= 0.159</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As revealed in Table 4, the results of the data analysis showed that the calculated r-ratio of 0.862 is greater than the critical r-ratio of 0.159, given 142 degree of freedom at 0.05 level of significance. This lead to the rejection of the null hypothesis and acceptance of alternative hypothesis. This means that there is significant relationship between Metacognitive skills and academic performance in English Language.

DISCUSSION

The result of the analysis showed that participants exposed to explicit instruction had the highest mean difference (18.77), followed by those exposed to reading strategies (14.57), while the control group had the lowest (2.23). Further analysis was made to determine whether significant difference existed in the posttest score in metacognitive skills due to experimental conditions. The result of the analysis showed a significant difference in the posttest scores, consequently the null hypothesis was rejected.

This finding supports those of other researchers who found that the effect of explicit instruction strategy and reading strategies on metacognitive skills improves students’ performance in reading comprehension and English language in general (Cubukcu,2008; Phakiti,2003; Song 2004; Muniz-Swicegood,2010; Sperling, Howard, Miller & Murphy, 2002).

The result aligns with the findings of Phakiti, (2003) in a study on the nature of cognitive strategies (comprehending, retrieval and memory strategies) and metacognitive strategies (monitoring, planning and evaluating strategies) and their direct and indirect relationships to English as EFL reading test performance, employing the Structural Equation Modelling (SEM) approach. The SEM results show...
that: (1) memory and retrieval strategies facilitated EFL reading test performance via comprehending strategies; (2) monitoring strategies performed an executive function on memory strategies, whereas evaluating strategies regulated retrieval strategies; (3) comprehending strategies were found to directly influence EFL reading test performance.

Song (2004) also affirmed the findings in a study on the use of explicit direct instruction on metacognitive skills. Song employed a revised strategy questionnaire mainly based on Purpura (1999). There was a significant prediction of students’ performance as Song found that metacognitive skills accounted for 80.6% of the variance in test score.

It is also in line with the findings of Cubukcu (2008) who presented a study of the teacher trainees in an English department who have received instruction in metacognitive skills awareness for reading comprehension. Within this study, students have been taught metacognitive strategies for reading in a five week program they have joined voluntarily. The purpose of the study was to determine the effectiveness of systematic direct instruction of multiple metacognitive skills designed to assist students in comprehending text. Specifically, the reading comprehension and vocabulary achievement of university students has been investigated to determine whether instruction incorporating metacognitive skills has led to an increase in the reading comprehension of expository texts. There was a significant increase in the reading performance of students exposed to metacognitive skills using systematic direct instruction.

Muniz-Swicegood, (2010) who analysed the performance of monolingual English-speaking children in reading performance and that of bilingual Spanish students. The research provided evidence that bilingual Spanish dominant students used fewer cognitive strategies than children who communicate through the use of only one communication system. The bilingual Spanish dominant students in this experimental study were taught to use metacognitive reading strategies while reading in Spanish. Primary findings indicated that, following training in metacognitive Spanish reading strategies, Spanish dominant bilingual children improved in the area of reading performance on the La Prueba Spanish reading test and the Iowa Test of Basic Skills English reading test. Post interview results of the Burke Reading Interview, translated into Spanish, showed increases in the frequency of Spanish reading strategies following metacognitive intervention.

The study contradicts that of Sperling et.al. (2002) that revealed in their study on the effect of metacognition on achievement and found that metacognition did not necessarily improve achievement but inconsistence as metacognitive processes are separate from achievement.

The most probable reason for this outcome may not far-fetched; explicit instruction strategy is a very comprehensive teaching programme of intervention that inculcates elements that positively impacts on the academic performance of participants.

The results of the data analysis showed that the calculated r-ratio of 0.862 is greater than the critical r-ratio of 0.159, given 142 degree of freedom at 0.05 level of significance. This lead to the rejection of the null hypothesis and acceptance of alternative hypothesis. This means that there is significant relationship between Metacognitive skills and academic performance in English Language. This result supports the findings of other researchers’ who agree that a significant relationship exists between metacognition and academic performance (Wray 1994; Wray and Lewis 1997; Palincsar & Brown 1984; Adey & Shayer1993).

The result aligns with the findings of Wray & Lewis (1997) in a study where metacognition has been linked to the development of reading and writing. Although metacognitive deficits are not seen as solely responsible for reading problems there is now substantial evidence that many poor readers (and writers) are unaware of strategic problem solving elements in their approach to tasks, and that metacognitive teaching strategies such as reciprocal teaching are reported as producing considerable gains in comprehension among poor readers (Palincsar & Brown 1984). These improvements have been maintained over time, and show evidence of transfer and generalisation to other areas of learning.

Adey & Shayer (1993) also corroborated the findings in their work where metacognition is also linked to progress in science and in mathematics. They also lend strong support to the view that metacognitive elements in thinking exist and can assist transfer of learning, especially if the teaching explicitly targets metacognition as a key aim of the learning activity. Students who are good at transfer show the same kinds of metacognitive strategies in science, mathematics, English or whatever the subject - they plan their approach to problems; they seek the information they need, check on progress and change strategies when things go wrong.

CONCLUSION AND RECOMMENDATION

Based on the findings of the study, it is concluded that there is positive relationship between metacognitive skills and academic achievement such that developing metacognitive skills of student will lead to the improvement in his/her academic performance. Therefore it is hereby recommended that:
1. Curriculum for the training secondary school students should incorporate instructions for the development of their metacognitive skills with the objective to enhance their academic and career success.

2. The ministry of Education should organize train-the-trainers workshop for teachers in English language to equip them with metacognitive strategies which will be incorporated into their instructional guide for teaching.

3. Educators at the secondary level should develop appropriate curriculum that incorporates metacognitive skills that will facilitate effective and seamless understanding of reading and comprehension in English language among students in the classroom.

REFERENCES


