ATTRIBUTIONAL STYLE AS CORRELATES OF STUDENTS ACADEMIC ACHIEVEMENT IN CHEMISTRY

By

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Abstract
This study was on attributional style as correlates of student’s academic achievement in chemistry. It was a survey research design with three research questions and two null hypotheses guiding the study. Chemistry achievement test (CAT) and a questionnaire on attribtional style (QAS) used for data collection were validated. Kuder Richardson formula (K-R21) was used in determining the reliability of the instruments. 1239 students were simple randomly selected from a population of 2467 senior secondary schools in six education zones in Anambra state. Pearson product moment correlation was used to analyze the data. Result indicates that students do not believe in achieving success through effort /ability (internal attributional style) rather they believe in external forces such as teachers, luck, miracle centres and external others for their academic pursuit. Encouraging students to be attributing their success or failure to internal factors rather than externals because internal attribution increases student’s effort in their academic achievement was recommended.

The federal and State governments have established several science schools, polytechnics, colleges and universities of science and technology. These investments are geared towards the production of more and more scientists and technologists who will work to take the nation to greater height in technological advancement. The efforts made by government do not seem to be yielding the expected result judging from records in science achievement in the institutions. This is particularly true in chemistry. It is unfortunate that under achievement of Senior Secondary Students in Chemistry has been a stumbling block for many secondary school students in gaining admission into tertiary institutions. Bature and Bature (2006) attributed the under achievement of students in chemistry to what the students feel and say about their success or failure in chemistry which is generally referred to as attribution.

Attribution is a process by which people assign causes to other behaviours. Wade and Tavris (1990) defined attribution as a process by which people are motivated to explain their own or others’ behaviour by pointing at causes of those behaviours to a situation or disposition. When one makes a situational attribution, the person regards an action as being caused by something in the environment. For instance, a student might perform poorly in chemistry test or examination and attribute the performance to inadequate provision of chemistry equipment in the laboratory but when one makes dispositional attribution, the action is regarded as being caused by something in the...
person such as motive, effort or ability. A student in a dispositional attribution can explain his/her performance in chemistry test, as due to his/her inadequate preparation for the test. Philipson (2006) claimed that there is relationship between student’s nature of attribution (locus of control) and their achievement in science. Park (2005) found a significant relationship between Locus of control (attributional style) and academic grade. Students with academic grade scored higher on internal locus of control and lower in external locus of control. Problem arises when students attribute failure to internal, stable and uncontrollable cause. For instance if a student says, “I can never pass this subject”, the student is implying that he lacks the ability to do the required task on the subject. For this student, ability is set and non-incremental as far as the subject is concerned; therefore the student is attributing his failure on the subject to what he believed to be an internal stable and uncontrollable cause (i.e. ability). Research findings of Adeoye (2003) showed that internal locus of control when compared with external locus of control place greater value on skills and achievement. They are also found to be more resistant to subtle manipulation, as well as being confident that they can control themselves and their actions. People also differ in the degree to which they believe that they have self control and feel personally responsible for what happens to them. According to Sotayo (2003) such perceptions involve a dimension of perceived locus of control’ (also known as internal and external control of reinforcement). Individual differences on this internal, external control dimension have been measured by a questionnaire that has yielded many correlates (Ojukwu, 1997). For example more intelligent people tend to perceive more out comes as under their own control, presumably because they, infact can control their faith better than less competent individuals. People often react quite differently to situations in which the pay-offs or the outcome seems to involve luck or chance than those that appear to depend on their own skill, ability or effort.

Georgion (2000) stated that research has designed studies that seek to evaluate the extent to which students achievement depend on locus of control (attributational style). Interest on the relationship between student’s locus of control and academic achievement made the researcher to embark on the study.

Statement of the Problem

Despite the relative importance of chemistry, it is dis-heartening to note that the student’s achievement in the subject in Senior Secondary School Certificate Examination has remained consistently poor. WASSCE annual report showed that only 11.4% and 12.03% of the entire candidates who participated in the examination (WASSCE) in 2010, 2011 and 2012 respectively obtained credits and above. Weiner (1986) and others have argued the importance of understanding the attributions children make about achievement related matters. This stem from the fact that students bring to the classroom habitual way of explaining the cause of their success or failure. They tend to attribute their achievement to one thing or the other. To an individual student, failing an examination may mean the result of his not being serious or his careless attitude towards preparation for the examination. To another it may mean an end result of factors totally external to him, the teacher’s hatred for him or it may be that luck has
turned against him. The focus of the study is to examine how external/internal attributional style correlates with academic achievement of SSII Chemistry students. Is the attributional style of male students related to that of females?

**Purpose of the Study**

The study purposely investigated the extent to which students’ attributional style (internal & external locus of control) correlates with their academic achievement in chemistry. Specifically the study investigated:

- the relationship between the student’s internal locus of control (attributional style) and academic achievement in chemistry.
- the relationship between the students’ external locus of control (attributional style) and academic achievement in chemistry.
- the relationship between attributional style of male and female students in chemistry.

**Research Questions**

Three research questions guided the study.

1. What is the relationship between the students’ internal locus of control (attributional style) and their academic achievement in Chemistry?
2. What is the relationship between students’ external locus of control (attributional style) and their academic achievement in Chemistry?
3. What is the relationship between the attributional style of male and female students in chemistry?

**Hypotheses**

Two null hypotheses were stated and tested to offer conclusive judgment on the research questions.

1. There is no significant relationship between internal locus of control (attributional style) and academic achievement of students in chemistry.
2. There is no significant relationship between external locus of control (attributional style) and academic achievement of students in chemistry.

**Research Methodology**

The study was a survey design which investigated the relationship between students’ internal/ external locus of control (attributional style) and academic achievement in chemistry. The study was carried out in six education zones in Anambra State namely Awka, Aguata, Ogidi, Otuocha, Onitsha and Nnwei. The population of the study area was 2,463 Government owned Secondary Schools in Anambra State made up of single sex and co-educational schools. Out of this a sample size of 1239 of chemistry students selected through simple random sampling technique constituted the study group. The study involved the use of two measuring instruments, a chemistry achievement test (CAT) developed by the researcher and a questionnaire on attributional style (QAS) which was developed by Cyberia (1996). The constructed chemistry achievement test was selected from acid, bases and salts, periodic table,
quantum theory and electrolysis which were topics expected to be known by every student that studied chemistry.

The attributional style questionnaire developed by cyberia (1996) was modified and used. The questionnaire (QAS) consists of two sections A and B. Section A has four structured and unstructured items intended to elicit information on personal data. Section B has 30 items on five point scale which elicited information on the students’ locus of control (attributional style). Items 1-15 sought information on internal locus of control (attributional style) while items 16-30 sought information on external locus of control. QAS requested the respondents to indicate their level of agreement or disagreement to each of the 30 items. Each item has five points scale which ranged from strongly agree (SA)=5, Agree (A) 4, undecided , (Un) =3, Disagree (D) =2, strongly disagree(SD)= 1 and vice versa. The two instruments were validated by experts from science education, and measurement and evaluation. The reliability of the CAT and QAS were established using kuder Richardson formula (K-R-21). The result of the analysis indicated reliability co-efficient score of 0.88 where that of QAS indicated reliability coefficient of 0.94. The instruments were personally administered by the researcher to the students and collected on the spot. The QAS was administered to the students after they had received their grades in the CAT. The student co-operated in responding to CAT and filling of the QAS. The research questions were analyzed using Pearson product moment correlation coefficient represented as ‘r’ Hypothesis 1,2 were analysed using correlation coefficient.

Results
Research Question 1
What is the relationship between the students’ internal attributional style and their academic achievement in chemistry?

Table 2. Students’ internal attributional style and Academic achievement.

<table>
<thead>
<tr>
<th>Variable</th>
<th>No of students</th>
<th>Mean Scores</th>
<th>Standard Deviation</th>
<th>Correlation Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Attributional Style</td>
<td>915</td>
<td>60.14</td>
<td>6.09</td>
<td>-0.005</td>
</tr>
<tr>
<td>Academic Achievement</td>
<td>915</td>
<td>50.43</td>
<td>13.92</td>
<td></td>
</tr>
</tbody>
</table>

The result shows that the mean score of student’s internal attributional style is 60.14 while their standard deviation is 6.09. For the students academic achievement the mean score is 50.43 with a standard deviation of 13.92. The result also indicates very low and negative correclation value of -0.005. This implies that internal locus of control is not related to academic achievements. A corresponding hypothesis, which was generated to further answer the research question, is H01.
Hypothesis I
There is no significant relationship between internal attribution style and students’ academic achievement in chemistry.

Table 2: Internal Attribution Style and Academic Achievement of Students in Chemistry.

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>X</th>
<th>SD</th>
<th>DF</th>
<th>R-CALR-CRT SIGN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decision Internal Attribution</td>
<td>915</td>
<td>60.14</td>
<td>6.09</td>
<td>913</td>
<td>-0.005 .874</td>
</tr>
<tr>
<td>Style</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-0.005 Accepted</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student Academic Achievement</td>
<td>915</td>
<td>50.43</td>
<td>13.95</td>
<td>913</td>
<td></td>
</tr>
</tbody>
</table>

From table 2, there is an indication that r-cal - 0.005 is less than r-critical of 0.874 at 913 degree of freedom and 0.05 level of significance, the null hypotheses is therefore accepted. This implies that there is no significant relationship between the students’ internal attributional style and their academic achievement in chemistry.

Research Question 2
What is the relationship between student’s external locus of control (attributional style) and their academic achievement in chemistry?

Table 3: Students’ External Locus of control (Attributional Style) and their academic Achievement

<table>
<thead>
<tr>
<th>Variable</th>
<th>No of students</th>
<th>Mean Score</th>
<th>Standard</th>
<th>Correlation</th>
<th>Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student’s External Attribution</td>
<td>252</td>
<td>47.60</td>
<td>2.16</td>
<td>.765</td>
<td></td>
</tr>
<tr>
<td>Style</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic Achievement</td>
<td>252</td>
<td>47.36</td>
<td>12.80</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A look at table 4 shows that the mean score of students’ external attributional style is 47.60 with standard deviation of 2.16 while the mean score of students’ academic achievement is 47.36 with standard deviation of 12.80. The result also shows very high and positive correlation value of 0.765. This indicates that students high score
on attributional style relates to their high score on academic achievement. A corresponding hypothesis generated to further answer this question is HO$_2$.

**Hypothesis 2**

There is no significant relationship between external attributional style and academic achievement of student in chemistry.

**Table 4:** External Attributional Style and Academic Achievement of Students in Chemistry

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>X</th>
<th>SD</th>
<th>DF</th>
<th>R-CALR-CRTSIGN</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Decision</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attributional</td>
<td>252</td>
<td>47.60</td>
<td>2.16</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td>Style</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.765</td>
</tr>
<tr>
<td>.765</td>
<td></td>
<td>.431</td>
<td>0.05</td>
<td></td>
<td>Rejected</td>
</tr>
<tr>
<td>Student</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic</td>
<td>252</td>
<td>47.36</td>
<td>12.80</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4 reveals that the computed r (.765) is greater than the critical r-value (.431) for two tailed test at 0.05 level of significance, the hypothesis is therefore rejected and concludes that there is significant relationship between the students’ external attributional style and their academic achievement in chemistry.

**Research Question 3**

What is the relationship between the attributional style of male and female students in chemistry.

**Table 5:** Relationship between the Attributional Style of Male and Female Students in Chemistry.

<table>
<thead>
<tr>
<th>Variable</th>
<th>No of student</th>
<th>Mean Score</th>
<th>Standard Deviation</th>
<th>Correlation Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>552</td>
<td>50.25</td>
<td>8.12</td>
<td>-0.009</td>
</tr>
<tr>
<td>Female</td>
<td>625</td>
<td>50.49</td>
<td>12.50</td>
<td></td>
</tr>
</tbody>
</table>

The result in table 5 shows that the mean score of male’s attributional style is 50.25 while their standard deviation is 8.12. For the females attributional style the mean score is 50.49 with a standard deviation of 12.50. The result also indicates a very low and negative correlation value of -0.009. This implies that attributional style of male and female are not related.
**Discussion**

The study investigated the relationship between the internal attributional style and academic achievement of chemistry students in Anambra State. The result of the study indicates very low negative and non-significant relationship ($r=-0.005 <0.05$).

This implies that the students’ internal attributional style is not related to their academic achievement. The possible explanation for non-significant relationship is that the students did not believe in their own power to determine their fate; probably because of religiousity, parental influence, cultural bias, lack of interest and influence of miracle centres. This is consistent with the findings of Bugental and Haphoney (2002) that causal attributions and beliefs related to the academic achievement of children are influenced by their surrounding culture. The non-significant relationship between internal attribution and achievement based on cultural influence corroborates with findings of Stephen and Dely’s (2003), that the type of subculture in which boys and girls live is a significant determinant of their locus of control (attributional style).

In view of this, the relationship between student’s external attributional style in chemistry was investigated. The result of the study showed that student’s external attributional style is positively related to their academic achievement. This finding agrees with Ejide (2006) that majority of the subjects were highly externally controlled and very religiously inclined, thus providing additional empirical support that religiousity correlates with externality (Helode and Barlinge 2000). This also supports the assertion of Georgian (2003) that student’s external attribution has significant effect on their performance. It similarly agrees with the findings of Lioyd (2005) which shows that student’s external attributions influence their performance in mathematics. However, the result of the findings contradicts the findings of Ojukwu (1997) who found no significant relationship between external attribution and academic success.

On the gender aspect of the study, result shows that attributional style of male and female are not related. This result of the finding conforms with the assertion of lioyd (2005) that girls tend to attribute their mathematics success to external factor, to effort and their failure to their own lack of ability (a self-defeating attribution pattern) whereas boys tend to ascribe the causes of their mathematics success to internal factors and their failure to external factors (enhancing attribution pattern). Ejide (2006) investigated the effect of gender on the attribution pattern of senior secondary school students and found that males were more externally controlled than females.

**Implication**

This study aimed at investigating the relationship between attributional style (internal/external locus of control) and academic achievement of students in chemistry. The study has shown that student’s internal attributional style is not related to their academic achievement in chemistry. Most of the students do not believe in their effort/ability in academic matters and the students might be doing well without a lot of effort. In this case as soon as the student experiences some difficulties in the learning process he or she will decline or decrease appropriate learning behavior (example I’m not good
at this) which might lead to the student’s drop out. Teachers on the other hand might primarily improve students’ academic achievement without necessarily fostering students’ self belief in their academics. This will in turn affect the future goals, emotional reactions and performance of students.

The study also revealed significant relationship between the student’s external attributional style and their academic achievement in chemistry. This confirms the fact that they are not internally controlled rather they are externally controlled. The students believed on external forces such as teachers, parental discipline, luck, miracle centers, help of friends and external others for their academic pursuit. The students with this belief will remain chronically poor performers and will rarely see their poor performance.

There is therefore need for students with external control to act more responsible and to avoid relying on outside forces to determine their success or failure.

**Recommendations**

Based on the findings of this study the following recommendations were proffered. Teachers and parents should encourage their children and students to be attributing their success or failure to internal factors rather than externals, because internal attributions help students to put more efforts in their academic achievement. Through hard work and skill training, internals believe it is possible to find reinforcement and avoid punishment.

Counselors should organize attributional re-training which will serve as a significant practical approach to increasing motivation and achievement.

All teachers should be sensitive to the attributions that student make, particularly in relation to their failure

The government and stakeholders should sponsor attributional re-training for both Sexes and desist from gender stereotyping in education.

**References**


Attributional Style As Correlates…


