EFFECTS OF DEMONSTRATION AND LECTURE METHODS OF TEACHING APICULTURE ON PERFORMANCE OF AGRIC STUDENTS IN ADAMAWA STATE UNIVERSITY, NIGERIA

Muhammad Rabi’u JA'AFAR-FURO1, Yusuf ABDULLAHI2, Buba Enoch BADGAL3

1Adamawa State University, Department of Agricultural Economics and Extension, PMB 25, Mubi, Nigeria, Email: muhammadfuro@gmail.com
2Adamawa State Polytechnic, College of Engineering and Environmental Studies, Department of Mechanical Engineering, Yola, Nigeria, Email: yusuf.abdullahi22@yahoo.com
3Adamawa State Polytechnic, College of Science and Technology, Department of Pure Science, Yola, Nigeria, Email: Badejobr2003@yahoo.com

Corresponding author: muhammadfuro@gmail.com

Abstract

A study was conducted using two (2) sets of 400 levels students to determine the effects of a combined demonstration and lecture methods of teaching apiculture on one hand, and lecture method on another, on performance of learners in the Faculty of Agriculture, Adamawa State University (ADSU), Mubi, Nigeria. Data were collected by observation of students’ scores, and personal verification of records/files to obtain information on age, gender and qualification at admission of both sets of students, whereas cost of instructional materials were determined through the Departmental Store Invoice (DSI). Descriptive statistics, computed cost components and correlation analyses were employed in the analyses of the data. Results revealed that while majority (52.00%) of the Conventional Students (CS) fell within the age range of 20-25 years, a larger proportion of the Sasakawa Students (SS) were within 31-35 years. Gender-wise, males accounted for the bulk of the students with 68.00% and 78.26% for CS and SS, respectively. In spite of the fact that Lecture Method (LM) had lower cost implication, it was found to be more efficient as a method of instruction among the students than a combined Demonstration and Lecture Methods (DLM). The male students slightly (0.456) performed better than their female (0.246) counterparts, with both coefficients significant at P<0.05. Its concluded that the application of LM of instruction was slightly more efficient than a combined DLM among the agriculture students of ADSU. Also, the male students were found to perform slightly better than the females. While the DLM could be more appropriate at primary and secondary schools, the LM is being recommended at tertiary level based on the findings of this study.

Key words: apiculture, demonstration, lecture, methods, Mubi, Nigeria

INTRODUCTION

Scholars the world over have now recognized that there are better methods of learning than through the conventional ways of instruction [1]. Post-secondary institutions and specifically universities are beginning to realise the relevance of utilisation of appropriate methods through which students can learn [2]. Further, several methods of teaching have been proved to be relatively ineffective on students’ ability to master and then retain important concepts. Some renowned researchers [3] noted that learning through some methods of teaching is passive rather than active. The applications of the traditional methods like lecture, memorizing, recitation, etc. do not seem to aid critical and creative thinking, and collaborative problem-solving. Two eminent authors [4] reported that the challenge in teaching therefore, is to create experiences that involve the students and support their own thinking explanations, evaluations, communications and applications of scientific models needed to make sense of these experiences. Several studies [4, 5, 6, and 7] have indicated that science subjects are more affected in this trend of development. Agriculture, which is purely science based, is more of practically-oriented learning experiences than mere theories. For instance, it was reported [5] that in spite of the frantic efforts made by the government to enhance teaching of science/agricultural science syllabus, by employment of qualified graduate teachers,
provision of facilities and prompt payment of salaries, among others, the recent students’ results at external examinations show a decline in performance. The choices of appropriate pedagogies for application then become imperative [8]. While lecture method of instruction largely involves *telling* as teacher-centered, the demonstration method of learning entails teaching through learning by doing in addition to *telling*. To further stress the relevance of participation of learners as a facilitating factor in concretising learning experiences, an educationist [9] observed that the demonstration method has been found to be extensively used in sciences, and by extension should be applied in teaching agricultural courses.

This investigation, a study of the effects of demonstration and lecture methods of teaching apiculture on performance of agricultural students in Adamawa State University, Mubi, Nigeria, is an attempt towards finding an appropriate method of aiding effective learning not only among agriculture students but science in general. However, specifically, it focused on determining the performance of students in apiculture study using demonstration and lecture methods of teaching apiculture on performance of agricultural students in Adamawa State University, Mubi, Nigeria, is an attempt towards finding an appropriate method of aiding effective learning not only among agriculture students but science in general. However, specifically, it focused on determining the performance of students in apiculture study using demonstration and lecture methods of teaching apiculture, and determining the effect of gender difference on application of demonstration and lecture methods of teaching apiculture in the Faculty of Agriculture of the University.

**MATERIALS AND METHODS**

**Sampling techniques and data collection**

Two sets of 400 level students were purposely selected for the study. The students were put into three groups based on their performance referred to as Cumulative Grade Point Aggregate (CGPA). The stratification is as follows: First stratum = 1.5-2.0; second stratum = 2.1-3.4 and third stratum = 3.5 & above. The total number of the two sets of students was 48, comprising 25 and 23 of 400 levels of Conventional and Sasakawa students, respectively. The Conventional group was taught using a combination of demonstration and lecture teaching methods, whereas the second group was instructed using lecture teaching method for comparison of learning outcomes. Data were collected by observation of students’ scores, and personal verification of records/files to obtain information on age, gender and qualification at admission of both sets of students, whereas cost of instructional materials were determined through the Departmental Store Invoice (DSI).

**Instructional materials for the study**

The instructional materials utilised for the experiment include the following:

1. Projector/PowerPoint
2. Notebook computer
3. Green laser pointer
4. Extension cord wire
5. Kenya top-bar beehive
6. Beehive stand
7. Plastic funnels
8. Beehive tool/knife
9. Bees suit (set)
10. A pair of hand gloves
11. A pair of rain boots
12. *Binta Sudan/scent*
13. Honeycomb/honey

The data collected were analysed using descriptive statistics (percentage, mean and frequency distribution), computation of cost components, and multiple correlation analysis. The latter was implicitly specified as:

\[
Y = f(X_1; X_2; X_3; X_4; X_5)
\]

Where:

- \(Y\) = performance
- \(X_1\) = age of student
- \(X_2\) = male student
- \(X_3\) = female student
- \(X_4\) = learning method
- \(X_5\) = level of education at admission

This was used to specifically analyse how the selected variables correlated with the performance of the students using the two methodologies.

**RESULTS AND DISCUSSIONS**

**Distribution of the selected variables of the students studied**
The results in Table 1 show the distribution of the two sets of the students based on age. It could be observed that majority (52.00%) of the Conventional Students (CS) fell within the age range of 20-25 years. On the other hand, a larger proportion (30.44%) of the Sasakawa Students (SS) was between 31 and 35 years of age. The implication of this result is that while most of the CS were young persons, the larger chunk (69.66%) of the SS was elderly persons.

Table 1. Distribution of the undergraduate students based on age

<table>
<thead>
<tr>
<th>Item</th>
<th>Conventional students</th>
<th>Sasakawa students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age range (years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 – 25</td>
<td>13 (52.00)</td>
<td>-</td>
</tr>
<tr>
<td>26 – 30</td>
<td>06 (24.00)</td>
<td></td>
</tr>
<tr>
<td>31 – 35</td>
<td>02 (8.00)</td>
<td>07 (30.44)</td>
</tr>
<tr>
<td>36 – 40</td>
<td>04 (16.00)</td>
<td>04 (17.39)</td>
</tr>
<tr>
<td>41 – 45</td>
<td>-</td>
<td>05 (21.74)</td>
</tr>
<tr>
<td>46 – 50</td>
<td>-</td>
<td>04 (17.39)</td>
</tr>
<tr>
<td>51 and above</td>
<td>-</td>
<td>03 (13.04)</td>
</tr>
<tr>
<td>Total</td>
<td>25 (100)</td>
<td>23 (100)</td>
</tr>
</tbody>
</table>

Note: Figures in parentheses are percentage of total
Source: Computed from field data (2012)

Gender wise, males accounted for the bulk of both sets of the students with 68.00% and 78.26% for CS and SS, respectively. Female students recorded only 21.74% for SS and 38.00% for CS, implying that males were the majority of students in the sets. This finding agreed with the reports of a governmental organisation [10] and a scholar [11] which stated that girl child enrolment in schools in the northern parts of the country and even sub-Saharan Africa at large is minimal compared to the male child counterpart. This result is shown in Table 2.

Table 2. Distribution of the students based on gender or sex

<table>
<thead>
<tr>
<th>Item</th>
<th>conventional students</th>
<th>Sasakawa students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex/Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>17 (68.00)</td>
<td>18 (78.26)</td>
</tr>
<tr>
<td>Female</td>
<td>08 (38.00)</td>
<td>05 (21.74)</td>
</tr>
<tr>
<td>Total</td>
<td>05 (100)</td>
<td>23 (100)</td>
</tr>
</tbody>
</table>

Note: Figures in parentheses show percentage of the total
Source: Computed from field data (2012)

The distribution of the students’ qualification at the time of admission is indicated in Table 3. The result shows that majority (52.00%) of the CS were admitted into the University with Senior Secondary Certificate of Education (SSCE) or West African Examination Council (WAEC) certificate, implying that they got into the university system immediately after their completion of secondary education through the Joint Admission and Matriculation Board (JAMB) examination.

However, for the SS, the whole (100%) lot was admitted into the university with Higher National Diploma certificate, indicating that the students might have had experience of a tertiary level education system before getting into the present university system thereby broadening their educational horizon.

Efficiency can be said to be a function of time and resources, involved in achieving result(s). In other words, it entails how minimum these resources/inputs are utilised toward realising the stated goal(s). In this regard, the costs of instructional materials as inputs used in teaching these students are captured in Table 4.

The latter indicates that it costed about three hundred and sixty one thousand three hundred and fifty naira only (N361, 350) to procure instructional materials used in teaching the CS applying a combined demonstration and lecture method.

Also, a total amount of three hundred and forty seven thousand naira only (N347, 000) was used to acquire instructional materials in teaching the SS applying lecture method.

In an effort to properly find out whether differences in performance existed in using the two methods of instructions among the two categories of students studied, and also the efficiency, Table 5 was computed.
As earlier stated, the Table 5 shows that while it costed N361, 350 to teach a total of 25 CS, a sum of N347, 000 was involved in teaching 23 SS. Therefore, the use of the combined methods of demonstration and lecture in teaching the students was slightly expensive than lecture method only.

Table 5. Assessment of efficiency of the two methods in determining performance of the two sets of the students

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost implication of using a method</th>
<th>Number of students</th>
<th>Cumulative scores of students</th>
<th>Average score of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.DLM</td>
<td>N361,350</td>
<td>25</td>
<td>1381</td>
<td>55.24</td>
</tr>
<tr>
<td></td>
<td>Cost of training per student = 1381 x 25 = N6, 541.46</td>
<td>361,350</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.LM</td>
<td>N347,000</td>
<td>23</td>
<td>1308</td>
<td>56.87</td>
</tr>
<tr>
<td></td>
<td>Cost of training per student = 1308 x 23 = N6, 101.68</td>
<td>347,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difference in cost and performance of the students in the two methods = N439.78 &amp; 1.63%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: N160 = US$1
Source: Computed from field data (2012)

Extrapolating from the available data in Table 5, it could be said that it cost a total sum of six thousand five hundred and forty one naira
These variables include age, male, female, learning method and level of education at admission. Of these five variables in Table 6, gender seemed to have slight influence.

Table 6. Pooled correlation coefficient matrix of selected factors influencing performance among the two categories of students

<table>
<thead>
<tr>
<th></th>
<th>Y</th>
<th>X1</th>
<th>X2</th>
<th>X3</th>
<th>X4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (X1)</td>
<td>0.115</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male (X2)</td>
<td>0.456* 0.312</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female (X3)</td>
<td>0.246* 0.188 0.241</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learning Method (X4)</td>
<td>0.092 0.913** 0.257 0.325</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of education at admission (X5)</td>
<td>-0.046 -0.973** -0.115 -0.873 -0.576</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: * value is significant at P<0.05
** value is significant at P<0.01

Source: Computed from field data (2012)

Pooling from the results of descriptive statistics on gender of the students in Table 2, most (72.92%) of the learners were males with minority (27.08%) as females. Also, from the findings of the pooled correlation analysis in Table 6, the male gender had slight significance (0.456) in positively influencing learning outcomes than the female gender (0.246) which were both significant at P<0.05. This finding is in line with some famous investigators’ report [13] that stated that at a probability of P<0.05, no statistically significant difference existed between the adjustive performance of male and female students. The male mean GPA was 68.4% and the female’s counterpart was 67.8%, indicating that the latter was slightly higher with a value of 0.6%. But for one imminent author [14], his findings revealed trends of mixed results, where for instance, the females were at par with males in completed coursework, and the former surpassed the latter in mastery of content.

However, the finding of this study disagreed with a group of authors [15] who documented the effect of gender on performance of undergraduate dental students at the University of Jordan, Amman. The imminent authors reported that the Cumulative Gross Point Aggregates (CGPA) of the female graduated students were significantly higher than those of the male students.

Based on the aforementioned, it could be stated that although generally the male gender has an insignificant positive effect in enhancing the learning outcomes of students, there are also areas where the female gender surpass the male counterpart. Therefore, further in-depth investigation is required towards documenting appropriate findings for these differences for utilisation by the education world.

CONCLUSIONS

It’s concluded that the application of LM of instruction was slightly more efficient than a combined DLM among the agriculture students of ADSU. Also, the male students were found to perform slightly better than the females.

While the DLM could be more appropriate at primary and secondary schools as being cited by several studies globally, the LM is being recommended at tertiary level based on the findings of this study.

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