Effect of Google Meet E-learning Technology on Building Students Knowledge

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

This study investigated the effect of Google meet e-learning technology on building students' knowledge in Economics in the face of COVID-19 pandemic in Imo State. Two purposes, two research questions and two hypotheses guided the study. The study adopted a quasi-experiment pre-test, post-test, control group design, involving two groups with analysis of covariance as post-hoc control. The population of the study consisted the entire year two students in Alvan Ikoku Federal College of Education, Owerri in Imo State, which are 2,063. The sample consisted of 80 Economics students, drawn from the population. Purposive sampling technique was used to select the 40 students in each class and assigned the classes to experimental and control groups. Google Meet E-learning technology Instructional Package (GMET-IP) and the Economics Achievement Test (EAT) were used as the instrument for data collection, while mean rating, standard deviation and analysis of covariance (ANCOVA) were used to answer the research questions.
questions and test the hypotheses. The content and face validities of the instruments were established by two (2) experts in Educational Measurement and Evaluation, two (2) lecturers teaching Economics, who after due corrections, fine-tuned them and certified them fit for administration. Pearson product moment correlation coefficients method was used to determine the reliability of the results obtained with the instrument; and to establish its construct validity that is inter correlations among items which yielded a reliability coefficient value of 0.78. Findings from the study indicated that Video Modules E-learning approach method had effect on the academic achievement of students in Basic Sciences. The treatments have more positive impact on the female students than male students, showing an interaction occurred between the gender. Conclusions were drawn and recommendations made from the findings of the study which includes that there is need for the incorporation of this e-learning approach into the teaching and learning of Economics in tertiary institutions in Imo State.

Keywords: Google meet; e-learning; COVID-19; academic achievement; students knowledge.

1. INTRODUCTION

One of the responsibilities of schools is to build knowledge and student learning outcomes and skills [1]. Students study at home through applications that have been agreed upon by educators and students. The learning room component that was originally a classroom in the school environment has shifted to the Google Meet application room.

Google meet is an interactive and alternative media, used for online learning. Google Meet Assist Educators use the lecture method in indirect learning activities. Interactive learning is expected to help students in building knowledge and learning outcomes [2]. Basic skills in the use of media aids during Study from Home (SFH) are the main requirements for educators and students in communication as well as the delivery of material to build student knowledge and learning outcomes. In the application of learning methods, basic skills are the main requirements to facilitate building knowledge and learning outcomes [3]. One of the supports in online learning is student books. In addition to educators delivering material, it is also expected that students will have the habit of reading in each context to support the process of building knowledge and learning outcomes. The habit of reading and bringing books closer to students is a natural way to encourage building knowledge and learning outcomes and facilitate the learning process [4]. Assistance by parents in reading books when the distance learning process helps students be more creative and innovative to follow the learning process optimally [5]. The challenges faced by educators are oriented towards changing planning instruments in learning that are significant for managing various things including building knowledge and learning outcomes [6].

E-learning platforms facilitate continued education during unplanned school closures or pandemics, which go a long way to reduce graduation delays [7]. The use of E-learning platforms provides opportunities for students to develop new skills and to structure their own learning trajectory [8]. Transition to E-learning platforms facilitates virtual classes and remote learning which is gradually becoming the new normal amid COVID-19 lockdown. These Virtual classes are similar to offline classes in a lot of ways: an instructor provides an engaging educational experience through video, image, text, audio, and PDF files, and students follow along to take notes, perform exercises, and engage in discussions and complete exams to test their knowledge. Considering the potential benefits associated with e-learning, the present study examines its impact on student's learning interests and academic achievements.

Aspects of building knowledge were adapted by researchers from John Piaget, namely building understanding; Build a scheme and adjust to the scheme; Organizing experience; Equilibration and Stages of development [9]. The Build understanding is the process of building knowledge and understanding of something that is processed through the five senses to produce a scheme [10,11, 12,13]. The Build a scheme and adjust to the scheme is the process of assimilating the scheme with information and experience and accommodation in adjusting to the scheme to consider information and experience [14]. The Organizing experience is part of a higher thought process [15]. The Equilibration and Stages of development is a process of cognitive conflict about the schemes that are being built with the information and experiences they have to create a process for change [16].
The need to achieve learning outcomes in learning activities both physical, mental, knowledge, and emotional in the responsibility of the tasks given. The researcher adopts from bloom in the assessment of student abilities that are tailored to the learning objectives and focuses on aspects of student cognitive learning outcomes. The learning outcomes refer to the course objectives that contain aspects is analyzing, evaluate, and create [17].

Gender refers to the sex of an individual either male or female. One of the millennium development goals (MDGs) is gender equality. As Fatokun and Odagboyi [18] noted, in most societies, the roles of women is knocked to the floor, preventing women from participating in, and benefitting from development efforts. They added that some subjects such as science and mathematics are branded masculine, while others like home economics, secretarial studies are branded feminine. Haliru [19] in his comparison of the knowledge of male and female in Geography, concluded that male students were very vast in the knowledge of environmental education than female students. Gin [20] observed that in a world where patriarchal values predominate; there are observable general sets of beliefs that women are inferior to men and therefore, this ideas and beliefs give men more power and more opportunities over women in the society [21,22,23].

2. PURPOSE OF THE RESEARCH

The purpose of this work is to determine the effect of Google Meet E-learning Technology (GMET) on building student’s knowledge in tertiary institutions in Imo State, Nigeria. The objectives are to:

1. Ascertain the effect of GMET on building student’s knowledge in tertiary institutions in Imo State, Nigeria;
2. Assess the academic achievement of male and female students on the use of GMET and conventional teaching methods.

2.1 Research Questions

The following research questions were asked:

1. What is the effect of GMET on building student’s knowledge in tertiary institutions in Imo State, Nigeria?

2. What is the academic achievement of male and female students on the use of GMET and conventional teaching methods?

2.2 Hypotheses

The following hypotheses were formulated and tested on a 0.05 level of significance:

H01 There is no significant difference between the academic achievement of students taught using GMET and those taught using conventional teaching method in tertiary institutions in Imo State, Nigeria.

H02 There is no significant difference in the academic achievement of male and female students on the use of GMET and conventional teaching method.

3. METHODOLOGY

The design of this study is quasi-experimental, pre-test, post-test, control group design. The study adopted a 2X2 factorial design. The subjects were assigned to treatment and control groups without randomization. Year two Economics classes were used for the study and the treatment was administered for one hour after school in order not to disrupt the academic program of the school. The study was carried out in Imo State. The State is in the South-eastern Geopolitical zone of Nigeria. The population of the study is 2,063, comprising the entire year two students in Alvan Ikoku Federal College of Education, Owerri. The sample for this study consists of 80 year two students from Economics Department. GMET was used to treat the students in class A, while conventional teaching method was used to treat class B. Purposive sampling technique was used to assign the two classes to experimental and control groups. Two instruments were used for data collection namely; Google Meet E-learning Technology Instructional Package (GMET-IP) and the Economics Achievement Test (EAT). The instrument consists of a researcher-made question items drawn from the topics taught in the experimental and control group classes. It consists of 30 well structured questions which were given to two experts in Economics and Measurement and Evaluation departments at Imo State University, who checked the content and face validity. Thereafter, they fine-tuned the instrument to be in simple and devoid of ambiguity. The researcher administered these instruments to 24 year two students in Economics from another school (Imo Polytechnics Umuagwo) which were not be part
of the study. The same test was re-administered to the same students after two weeks. The pre-test and post-test scores were compared using the Pearson Product Moment Correlation Coefficients method to determine the reliability of the results obtained which yielded a reliability coefficient value of 0.78.

4. RESULTS AND DISCUSSION

4.1 Research Question One

What is the effect of GMET on building student’s knowledge in tertiary institutions in Imo State, Nigeria? The result of the data analysis has been summarized in table 1.

The mean and the standard deviation were computed to answer research question two. Although the pre-test mean of the GMET group exceeds that of the control group by 2.47, the post-test mean (x̄) score follow similar pattern. The GMET group had a mean gain of 4.09 over the pre-test mean score of 16.36 while the lecture group has 14.52 post-test mean with a mean gain of 0.63 over the pre-test. Having considered this higher mean of 20.45 in post-test, the researcher concluded that the GMET of teaching enhances students’ knowledge in Economics.

4.2 Research Question Two

What is the academic achievement of male and female students on the use of GMET? The result of the data analysis has been summarized in Table 4.

Table 2 showed the difference in mean being 1.38 in the GMET, the females had a mean of 20.6 while the males had 19.84 with standard deviations of 2.87 and 4.63 respectively. The difference in mean here was 0.76. The mean of both genders show only slight variation. The researcher therefore, concluded that the gender mean difference in achievement in the treatment variables does not greatly affect student’s academic achievement.

4.3 Hypothesis One

There is no significant difference between the academic achievement of students taught using GMET and those taught using conventional teaching method in tertiary institutions in Imo State, Nigeria. The result of the data analysis has been summarized in Table 3.

The summary of ANCOVA in Table 4.3 gave a calculated F of 28.14 while the critical F remains 3.91 given 1 and 118 degrees of freedom at the 0.05 alpha level of significance, the null hypothesis was therefore rejected. Rejection of the null hypothesis given a ̅ of 20.45 for the GMET group and a ̅ of 14.68 for the control implies that those in GMET group achieved more in Economics after the treatment. The researcher therefore concluded that the GMET impacted positively better than the lecture method among the students offering Economics.

4.4 Hypothesis Two

There is no significant difference in the academic achievement of male and female students on the use of GMET and conventional teaching method. The result of the data analysis has been summarized in Table 4.

Table 1. Summary of Mean and Standard Deviation on Students Achievement using GMET

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>̄</td>
</tr>
<tr>
<td>GMET</td>
<td>40</td>
<td>16.36</td>
</tr>
<tr>
<td>Lecture Method</td>
<td>40</td>
<td>13.89</td>
</tr>
<tr>
<td>Total</td>
<td>80</td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Summary of Mean and Standard Deviation of the Treatment Group by Achievement and Gender

<table>
<thead>
<tr>
<th>Variable</th>
<th>GMET</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>Male</td>
<td>45</td>
</tr>
<tr>
<td>Female</td>
<td>35</td>
</tr>
<tr>
<td>Total</td>
<td>80</td>
</tr>
</tbody>
</table>
Table 3. Summary of ANCOVA showing the Mean Difference between the GMET Group and Lecture Method Group

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Cal</th>
<th>F Crit.</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>1</td>
<td>27574.9</td>
<td>27574.9</td>
<td></td>
<td></td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td>Within groups</td>
<td>78</td>
<td>183758.85</td>
<td>980.075</td>
<td>*28.14</td>
<td>3.91</td>
<td>Reject H&lt;sub&gt;0&lt;/sub&gt;</td>
</tr>
<tr>
<td>Total</td>
<td>79</td>
<td>211,333.75</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant, P<0.05; Calculated f= 28.14, critical f = 3.91 given 1 & 78 degrees of freedom

Table 4. Summary of ANCOVA Showing the interaction effect by gender and treatment in Economics

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>F Cal</th>
<th>F Crit.</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment (Factor A main effect)</td>
<td>1</td>
<td>0.6</td>
<td>0.06</td>
<td>*0.057</td>
<td>3.91</td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td>Sex of students (Factors B main effect)</td>
<td>1</td>
<td>108.04</td>
<td>108.04</td>
<td>*10.24</td>
<td></td>
<td>Retain H&lt;sub&gt;0&lt;/sub&gt;</td>
</tr>
<tr>
<td>Sex of students x treatment</td>
<td>1</td>
<td>41.1</td>
<td>41.1</td>
<td>*3.9</td>
<td></td>
<td>P&lt;0.05</td>
</tr>
<tr>
<td>Within groups</td>
<td>76</td>
<td>2068.05</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>79</td>
<td>2135.59</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. CONCLUSION AND RECOMMENDATIONS

The GMET positively impacted on the students' knowledge and academic achievement in Economics to a very high extent. Students' performance increased using this method. From the findings, the following recommendations are made:

1. The treatments have more positive impact on the female students than male students, showing an interaction occurred between the gender. There is need to make the male students more abreast with this modern learning method.
2. There is need for the incorporation of modern instructional methods like Google meet e-learning technology into the teaching and learning of Economics in tertiary institutions in Nigeria. This will ensure that students are abreast with global best practices which enhance achievement.
3. The entire teachers must train and retrain themselves continuously on the use of instructional resources they should at least understand the organization of content. This will enable students to participate actively in the lesson and arouse the interest of the students.
4. Government on its part should provide adequate, effective and functional
instructional resources to higher institutions which make lessons easy to deliver, interesting and successful.

CONSENT

As per international standard or university standard, Participants’ written consent has been collected and preserved by the authors.

ETHICAL PROCEDURE

As per international standard or university standard written ethical approval has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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