

EFFECTS OF GOOGLE FORMS QUESTION TOOL ON REDUCING GEOGRAPHY STUDENTS TEST ANXIETY AND ENHANCING ACHIEVEMENT

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ABSTRACT

This study sought to establish the effect of Google Forms Question Tool (GFQT) on Reducing Geography Students' Test Anxiety and Enhancing Achievement among Geography undergraduates in the University of Calabar, Calabar, Nigeria. Quasi-experimental research design was adopted for the study. The sample for the study comprised 115 second-year (200 level) Geography undergraduates selected using purposive sampling technique. A 20-item Geography Achievement Test (GAT) and a 10-item Google Forms Question Tool and Test Anxiety Questionnaire (GFQTTAQ) were the instruments used for data collection. Reliability coefficients of 0.73 and 0.78 were respectively obtained for the two instruments. Mean and standard deviation were used to answer the research questions while the analysis of covariance (ANCOVA) was adopted in testing the hypotheses at 0.05 level of significance. The findings of the study revealed among others that: Google Forms Question Tool significantly reduced Geography undergraduates' test anxiety and enhanced their achievement. It was therefore concluded that GFQT could be effective in reducing Geography undergraduates' test anxiety and improving their academic achievement. Based on the findings, it was recommended that government, school administrators and other relevant stakeholders should make efforts to train teachers in the use of innovative assessment strategies such as Google Forms Question Tool.

Keywords: Achievement, Geography, Google Forms Question Tool, Test Anxiety, Students.

I. INTRODUCTION

Quite a number of studies have established that high test anxiety can be very disastrous on students' achievement across the various levels of education (Rachel & Chidsey; Nemati, in Mohamadi, Alishahi, & Soleimani, 2014; Weda & Sakti, 2018). According to these authors, test anxiety occurs when one experience a sense of nervousness during, before, and after a particular examination. They added that such fundamental human feeling could have enabling as well as devastating impacts on teaching and learning. Moderate level of anxiety can be of benefit to learners, whereas, high level of anxiety results in a decline in their achievement (Brown, 2007). Drawing from the foregoing, it is glaring, that test anxiety plays an invaluable role in students' achievement.

In a bid to addressing its effects on students' achievement, researchers over the years (Brown, 2007; Mohamadi et al, 2014; Weda & Sakti, 2018), have dwelt so much on various strategies to reducing students' test anxiety on one hand while enhancing better achievement on the other. These efforts have been so much centered on the traditional methods of testing (pen and paper-based), with little or nothing on the online based methods which employs the use of some online survey forms like Google Forms. Which will in no small measure serve as an innovative paradigm shift that might bring about a turnaround in students' achievement in Geography in particular and all other subjects in general.

In a world that information and communication technology (ICT) have since taken hold of the wheels of development in almost if not all sectors of human existence including education, it would be a welcome development to holistically explore all that it brings that makes life more convenient to live in the area of testing and assessment of students especially in the post COVID era which demands the adoption of innovations in virtually all spheres of human existence. Google Forms came to the fore in 2008 as an online survey tool for data collection and since then have been quite useful in the area of computer-based test (CBT). Castro (2018) remarked that it is an assessment and data gathering web-based application. The author added that Google Forms quizzes can be used to adapt content, individualize instructional goals, collect performance data, and connect students and teachers locally or from different parts of the world. Teachers can create and distribute Google Forms' formative assessment technology, resulting in synchronous student performance feedback that communicates critical information related to learning objectives for teachers and students. There is no gainsaying the fact that the benefits of embracing the innovations offered by ICT applications that involves

Google Forms are too numerous to be overlooked. Robert et al (2018) posited that CBT has many advantages over the traditional paper-pencil method of testing. The authors noted that it gives candidates instant feedback besides the option of taking practice tests whenever they want since it is Internet-based, a situation that enhances not only their preparedness but also confidence towards the exams; unlike the traditional paper-pencil (pen and paper) method of testing which does not have such allowance and as such, leaves the students with so much anxiety prior to the exams and even after while feedback (results) delays. Given that majority of students are at home with most of the ICT applications through the use of mobile phones, laptops and other devices (Zur & Zur, 2011), using what they are fond of or already very interested in to tackling what apparently seems a great challenge to their becoming the best they are meant to be might be of great help in making them feel much more at home with examinations and performing excellently as a result.

Available literature on the usability of ICT and the various applications it brings have shown that students perform better when any of the avenues ICT offers is used in teaching and learning (Essien & Essien, 2016; Luecht & Sireci, 2011). This is because as digital natives, majority of students across the levels of education especially from upper basic to undergraduate are much more comfortable with the innovation that ICT employs in teaching and assessing them than the traditional methods (Djenno et al., 2015; Zur & Zur, 2011). Hence, they enjoy every bit of their being assessed with online-based forms and this might drastically reduce test-anxiety in them on one hand, while boosting their performance on the other hand. That is why some researchers have advised that students should be encouraged not to be anxious when facing any examinations (Effiom & Bassey, 2018).

Cassady and Gridley (2005) examined the effects of online assessment materials on undergraduates' experiences with emphasis on students' testing behaviours (e.g., performance, approaches to study, beliefs, such as test nervousness and alleged test threat). The findings showed no harm to students' perceptions of tests or performances on tests when comparing online to paper-pencil assessments. And that, candidates who partook in online tests reported lower levels of perceived test threat. The result further showed that concerning formative assessment, a small benefit for using online practice tests prior to actual exams exists. The observed effect seems to be partly derived from the decrease in the side effects of negative test perceptions obtained in settings where practice tests were available. The findings suggest the integration of online practice tests to help students prepare for course exams and also reveal that secure web-based testing can aid undergraduate instruction through improved student confidence and increased instructional time.

In a related study, Machmud and Abdulah (2018) carried out a study to determine the impact of mobile phone in reducing students' anxiety in speaking English and boosting their oral skill. The study adopted quasi experimental method, and collected data using questionnaire of foreign language anxiety classroom scale, and oral test for speaking ability. The study employed a 2-by-2 factorial design and adopted analysis of variance (ANOVA) for data analyses. The outcome showed amongst others that: students taught using mobile phone achieved higher than those that were taught using traditional (conventional) teaching, besides their anxiety level being greatly reduced.

Reyes and Castillo (2015) carried out a study to determine the relationship between performance of students in the area of Mathematics specifically in Algebra and Trigonometry and their test anxiety. The researchers used the descriptive correlation research method that could best present and analyze information on the documentary analysis in students' mathematics performance and descriptive survey about math test anxiety. The data was obtained from examination administered in Algebra and Trigonometry for the academic year of 2013-2014. The respondents of the study were 120 students who did Algebra in the first semester before taking Trigonometry for the second semester of the same school year. The statistical tools used were frequency, weighted mean and Pearson's Product Moment Correlation Coefficient. The findings showed that the students who took the subjects obtained a poor performance rating. Also, test anxiety in mathematics averagely sensed by the students was seen as a factor that might have affected the students' mathematics performance. The researchers also formulated an action plan meant to boost mathematics achievement and enhance the rate of passing the subject in the department. The action plan focused on conducting/attending seminars regarding different learning strategies; conducting tutorial session or peer tutoring especially for those who have low performance in mathematics subjects; conducting seminar on reduction of test anxiety; conducting stress briefing to the students through the proctor before taking the exam; providing reward system in mathematics

classes; and adapt fun learning techniques in teaching mathematics. And also, the researchers recommended to the math teachers to develop different learning strategies in all mathematics subjects and to provide relaxation techniques before giving the exam to their students. This means where students are made to be in a relaxed mood and confident about their ability to handle any task they might be posed with; they stand to do better in their handling of such task.

Obih, et al (2017) studied the effect of assessment for learning method (AFLM) on students' academic achievement in Economics in Secondary Schools in Imo State, Nigeria. The study had two research questions and hypotheses to give it a direction. It employed the quasi-experimental research design with a population of 30,430 students and a sample of 68 Economics SS2 students from two intact classes. The sample was drawn through purposive and cluster sampling techniques. A 40-item Economics Achievement Test (EAT) developed by the researcher was used for data collection. Mean and standard deviation were used to answer the research questions while One Way and Two-Way Analysis of Covariance (ANCOVA) was used to test the hypotheses at 0.05 level of significance. Findings revealed that AFLM is more effective than traditional assessment method (TAM) in Economics. It was further observed that there was significant difference between the mean achievement score of the students in the two groups. The study recommended among others that: educational ministries/departments should organize and sponsor Economics workshops, exhibitions, seminars, and conferences periodically for Economics teachers to learn how to adopt assessment for learning method in the schools through the use of rubrics and portfolios. This study is related to the present study in that they are both looking at how best students could be helped to be at their best in terms of achievement through innovative assessment.

Statement of the Problem

Like Mathematics, Geography, seems to have become a dreaded school subject to many senior secondary school students in Nigeria. Probable reasons for the scenario could be the poor handling of map work and some mild calculations like latitude and longitude by unqualified teachers in most of our secondary schools across the nation; and the resultant poor performance in certificate examinations. A situation that has brought about a drastic decline in enrollment and interest in senior secondary school geography which serves as the base from where university undergraduates emerge.

Consequently, to solve the problem inefficient teachers and poor delivery of content matter have caused, there is need to deliberately explore means of encouraging the resilient students who amidst all the odds have chosen to do Geography by introducing innovations in teaching methods as well as assessment methods. This, no doubt might stir up interest and boost students' confidence in Geography which will result not only in reduction in test anxiety and increased enrollment but also improved achievement in examinations. This study seeks to establish the effect of Google Forms Question Tool in Reducing Geography Students' Test Anxiety and Enhancing Achievement among 200 level students of Geography in the Department of Geography and Environmental Science, University of Calabar, Calabar, Nigeria. The questions that come to mind here are: to what extent does Google Forms Question Tool (GFQT)-based exams affect students' level of anxiety compared to pen and paper (PAP)-based exams; to what extent does students' achievement scores in Google Forms Question Tool (GFQT)-based exams differ with traditional pen and paper (PAP)-based exams?

Purpose of the Study

The main focus of this study is to examine the effect of Google Forms question tool on Reducing Geography Students' Test Anxiety and Enhancing Achievement among 200 level students of Geography in the Department of Geography and Environmental Science, University of Calabar, Calabar, Nigeria. Specifically, the study intends to establish:

1. The difference in Geography undergraduates' mean anxiety scores in GFQT and PAP based exams
2. The difference in Geography undergraduates' mean achievement score in GFQT and PAP based exams

Research questions

Answers shall be sought for the following questions:

1. What is the difference in Geography undergraduates' mean anxiety scores in GFQT and PAP based exams?
2. What is the difference in Geography undergraduates' mean achievement scores in GFQT and PAP based exams?

Research hypotheses

The following hypotheses were formulated and tested at 0.05 level of significance to direct the study

H0₁: There is no significant difference in Geography undergraduates' mean anxiety scores in GFQT and PAP based exams

H0₂: There is no significant difference in Geography undergraduates' mean achievement scores in GFQT and PAP based exams

II. METHODOLOGY

This study employed the quasi-experimental design. Precisely, it adopted a pre-test and post-test non-equivalent control group design. The design is appropriate for this study because it allows the use of intact classes instead of randomly composed samples. The use of intact classes is to avoid alteration in regular class sessions. Here, the researchers used two groups as experimental groups (Nworgu, 2015). As such, non-equivalent intact classes were randomly assigned to the two groups (i.e., the experimental and control group were randomly assigned). The sample size was 115 second-year (200 level) geography students, made up of 33 females and 82 males for 2019/2020 Session. The experimental group made up of 68 participants (19 females and 49 males) while the control group had 47 participants (14 females and 33 males) totaling 115 students. Purposive sampling technique was used to select 200 level students due to the very meagre number of females in the other levels among other reasons. Geography Achievement Test (GAT) and Google Forms Question Tool and Test Anxiety Questionnaire (GFQTTAQ) were the instruments used to collect the required data for the study. While the Geography Achievement Test (GAT) was a 20-item multiple choice Geography test that tested students' knowledge on Geography themes, the Google Forms Question Tool and Test Anxiety Questionnaire (GFQTTAQ) was a 10-item instrument structured on a 4-point Likert scale to measure students' text anxiety level and preference for GFQT-based exams. The reliability index of GAT was 0.73 using Kuder-Richardson twenty (K-R₂₀) formula while that of GFQTTAQ was 0.78 using Cronbach Alpha. The pilot testing was carried out using students of the Cross River State College of Education, Akamkpa, Cross River State. Geography Test was administered to students in the experimental class using Google Forms question tool, whereas, those in the control group were given the same test using pen and paper (i.e., the conventional method). Data for the study were collected through pre-test and post-test using GAT and GFQTTAQ. The pre-test was administered to the subjects before the treatment to measure the students' group equivalence and to provide the researchers with baseline data about the subjects, while post-test was administered to students two week after the treatment. The data generated was analyzed using mean and standard deviation to answer the research questions while analysis of covariance (ANCOVA) was used in testing the hypotheses at the 0.05 level of significance.

III. RESULTS AND DISCUSSION

Results

Research Question 1: What is the difference in Geography undergraduates' mean anxiety scores for GFQT and PAP based exams?

Table 1: Mean anxiety scores of Geography undergraduates on GFQT and PAP based exams

| Groups | N | Pretest | SD | Posttest | SD | MEAN GAIN |
|------------|----|---------|------|----------|------|-----------|
| Exp (GFQT) | 68 | 23.15 | 1.43 | 18.96 | 2.21 | - 4.19 |
| Cont (PAP) | 47 | 22.64 | 3.58 | 16.61 | 3.63 | - 6.03 |

Data presented in table 1, shows that the pretest mean anxiety scores of students tested with GFQT and PAP based exams are 23.15 (SD of 1.43) and 22.64 (SD of 3.58) in that order. While at posttest, the anxiety scores reduced to 18.96 (SD of 2.21) and 16.61 (SD of 3.63) in that order. Indicating a mean gain of - 4.19 and - 6.03 respectively for students tested with GFQT and PAP based exams. Which implies that students tested with GFQT had reduced level of anxiety compared to those tested with PAP based exams.

Research Question 2: What is the difference in Geography undergraduates' mean achievement scores in GFQT and PAP based exams?

Table 2: Mean achievement scores of Geography undergraduates on GFQT and PAP based exams

| Groups | N | Pretest | SD | Posttest | SD | MEAN GAIN |
|------------|----|---------|------|----------|------|-----------|
| Exp (GFQT) | 68 | 17.74 | 1.11 | 25.19 | 1.31 | 7.45 |
| Cont (PAP) | 47 | 14.63 | 2.43 | 20.83 | 2.85 | 6.20 |

Results in table 2, indicates that the pretest mean achievement scores of students tested with GFQT and PAP based exams are 17.74 (SD of 1.11) and 14.63 (SD of 2.43) in that order. While at posttest, the mean achievement scores increased to 25.19 (SD of 1.31) and 20.83 (SD of 2.85) in that order. Indicating a mean gain of 7.45 and 6.20 respectively for students tested with GFQT and PAP based exams. Which implies that students tested with GFQT had higher mean achievement compared to those tested with PAP based exams.

Hypothesis One

H0₁: There is no significant difference in Geography undergraduates' mean anxiety level in GFQT and PAP based exams

Table 3: Analysis of Covariance (ANCOVA) for the significance difference in the mean anxiety scores of students tested with GFQT and PAP based exams

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. | Decision |
|-----------------|-------------------------|-----|-------------|---------|------|-------------|
| Corrected Model | 861.556 | 2 | 430.778 | 742.657 | .000 | |
| Intercept | 108.458 | 1 | 108.458 | 186.980 | .000 | |
| Pretest | 106.838 | 1 | 106.838 | 184.188 | .000 | |
| Treatment | 47.924 | 1 | 47.924 | 82.620 | .000 | Significant |
| Error | 64.966 | 112 | .580 | | | |
| Total | 50805.000 | 115 | | | | |
| Corrected Total | 926.522 | 114 | | | | |

Significant p<0.05

Table 3 shows the ANCOVA result for the difference in the mean anxiety scores of students tested with GFQT and PAP based exams. From the table, it is observed that F-value (82.620) is significant at 0.000. This level is less than 0.05 significant level at which the null hypothesis was tested; as such, the null hypothesis was rejected. Thus, there is a significant difference in mean anxiety scores of students tested with GFQT and PAP based exams.

Hypothesis Two

H0₂: There is no significant difference in Geography undergraduates' mean achievement scores in GFQT and PAP based exams

Table 4: Analysis of Covariance (ANCOVA) for the significance difference in the mean achievement scores of students tested with GFQT and PAP based exams

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. | Decision |
|-----------------|-------------------------|-----|-------------|---------|------|-------------|
| Corrected Model | 1410.872 | 2 | 705.436 | 882.679 | .000 | |
| Intercept | 132.736 | 1 | 132.736 | 166.086 | .000 | |
| Pretest | 330.919 | 1 | 330.919 | 414.064 | .000 | |
| Treatment | 13.715 | 1 | 13.715 | 17.161 | .000 | Significant |
| Error | 89.510 | 112 | .799 | | | |
| Total | 60464.000 | 115 | | | | |

| | | |
|-----------------|----------|-----|
| Corrected Total | 1500.383 | 114 |
|-----------------|----------|-----|

Significant $p < 0.05$

Table 4 shows the ANCOVA result for the difference in the mean achievement scores of students tested with GFQT and PAP based exams. From the table, it is observed that F-value (17.161) is significant at 0.000. This level is less than 0.05 significant level at which the null hypothesis was tested; as such, the null hypothesis was rejected. Thus, there is a significant difference in mean achievement scores of students tested with GFQT and PAP based exams.

Discussion of Findings

The result showed that Google Forms Question Tool (GFQT) based exams is more effective in reducing Geography undergraduates' test anxiety than pen and paper (PAP) based exams. This implies that Google Forms Question Tool (GFQT) based exams is more effective in the reduction of Geography undergraduates' test anxiety than pen and paper (PAP) based exams. The study also revealed that there is a significant difference in the mean anxiety scores of students tested with GFQT and PAP based exams. This confirms the effectiveness of GFQT in the reduction of Geography undergraduates' test anxiety. This finding is in consonance with Djenno et al. (2015) and Zur and Zur, (2011) who independently remarked that as digital natives, most students across the levels of education especially from upper basic to undergraduate are much more comfortable with innovative teaching and assessment that evolve from ICT than the traditional methods (Djenno et al., 2015; Zur & Zur, 2011). And as such, enjoy online assessment which drastically reduces test-anxiety in them on one hand, while boosting their achievement on the other hand. The findings also agree with Machmud and Abdulah (2018) who in a related study observed that students who were taught by using mobile phone application achieved higher than students' who were taught using traditional teaching method. And that students' level of test anxiety was greatly reduced through the use of mobile phone application. This implies that the use of mobile phone application brings about better achievement of students' speaking ability besides reducing their test anxiety level.

Finding with respect to research question two showed that Geography undergraduates tested with GFQT-based exams achieved slightly higher than those tested with PAP-based exams. Finding from the corresponding hypothesis revealed that there is a significant difference in the mean achievement scores of students tested with GFQT and PAP based exams. Again, this confirms the effectiveness of GFQT based exams over PAP based exams in improving the achievement of Geography undergraduates. This finding agrees with Obih, et al (2017) whose study revealed that assessment for learning method (AFLM) is more effective than traditional assessment method (TAM). It was observed that there was significant difference between the mean achievement score of the students in the two groups.

IV. CONCLUSION

From the findings of this study, it can be inferred that Google Forms Question Tool was effective in the reduction of Geography undergraduates' test anxiety and enhanced their academic achievement. This implies that innovative ICT-based assessment can solve the problem of test anxiety among students and as well enhance students' academic achievement.

Recommendation

Based on the findings of this study, the following recommendations were made:

1. Government, school administrators and other relevant stakeholders should make efforts to train teachers in the use of innovative assessment strategies such as Google Forms Question Tool by regularly engaging teachers in capacity-building conferences, seminars and workshops.
2. Teachers should employ Google Forms Question Tool in the classroom to reduce test anxiety and enhance students' academic achievement.

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