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An Assessment of the Differences in the Mean Skill Scores between Male and Female Social Studies Teachers before and after Exposure to ICT for Classroom Pedagogy (A Case Study of Benue State-Nigeria)

***Udorough, Tersoo; & **Ekom, Emmanuel Edom**

*Department of Computer Science Education, Federal College of Education, Odugbo, Benue State. **Department of Social Studies Education, Federal College of Education, Odugbo, Benue State

Corresponding Author: udoroughtersoo@fceodugbo.edu.ng

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Abstract

This study assesses the differences in the mean skill scores between male and female social studies teachers before and after exposure to ICT for classroom pedagogy, taking Benue State, Nigeria as a case study, using a one group, pre-test post-test quasi-experimental design. A sample of 224 Social Studies Teachers (130 males and 94 females which represents 58.0% and 42.0% respectively) was selected from 36 Upper Basic Schools across the three Education Zones of Benue State using a multistage sampling technique. The instrument for data

collection was Social Studies Teachers ICT Skills Observation Scale (SSTISOS) developed by the researchers. Construct validity of the instrument was established through expert reviews. The reliability of the SSTISOS was tested through a pilot study involving 30 Social Studies teachers who were not part of the main study. Data collected were analyzed using both descriptive and inferential statistical methods. Two research hypotheses were tested at the significance level of 0.05 and was found that there is no significant difference in the mean skill scores between male and female Social Studies teachers before and after exposure to ICT training ($p > 0.05$). In conclusion, this study has highlighted the critical role of ICT training in enhancing the skills of Social Studies teachers in Benue State. From the results, gender does not significantly influence skill acquisition in ICT. When provided with equal opportunities, both gender can effectively develop their ICT skills, contributing to a more equitable educational system. Implementation of Continuous Professional Development Programs, Promotion of Gender Equity in Training Opportunities, Establishment of ICT Resource Centers and Incorporation of ICT in Teacher Education Programs were then recommended.

Introduction

Education in Nigeria has shifted from the traditional methods of face-to-face tuition and the transaction of paper-based teaching and learning materials to learning via Information and Communication Technologies (Lee & Cha,

2022). Many studies have demonstrated that the use of ICT enhances learning and teaching. In Nigeria, schools have not been an exception, as the use of ICT has spread across all schools in the country (Jummai, 2021). In addition, the use of ICT in teaching K-12 science highlights the need for research that investigates the applications and integration of ICT in instruction among teachers of Social Studies in Benue State. The study was conducted in Benue State (Achor et al., 2020). It was noted that ICT has gained ground in the state, where it is incorporated into every facet of life, including education. Some of the interesting features of Benue State are its high level of ICT penetration. Some of the significant challenges facing Benue State are how teachers will use ICT in delivering instruction. National policy on education demands that teachers should continually acquire new skills, such as the use of ICT for instructional activities. The concern is how teachers who may not be ICT compliant will use ICT for instructional delivery (Esfijani & Zamani, 2020).

Federal Government has made significant investments in ICT to educational organizations and institutions, from the basic level up to the university level during the last decade. There has been the provision of logistics and infrastructure, particularly, at the colleges of education and universities. The aim is to prepare technologically skilled graduate teachers who can incorporate ICT in their teaching. However, studies have found that teachers of Social Studies are not integrating ICT into their lessons as intended. Despite the capacity of ICT for training, practice and explorative practices, social studies education teachers seem not to have been able to incorporate ICT into their curricula and teaching. Research has also revealed that social studies teachers were among the least likely to use ICT and engage students in higher-order thought practices. Given the low rate of ICT use in the Social Studies curriculum, it is essential to examine the application and integration of information and communication technology in teaching among Social Studies Teachers in Benue State, Nigeria.

The major aim of teaching is to enhance learning which consists of a worthwhile change in attitude, perception, and acquisition of new skills and knowledge that could equip the learner for improved performance in school and life in general. Unfortunately, there is a glaring gap between these aims and what is attainable in the society. Social Studies curriculum at the secondary school level seems not to have achieved its objectives as the expected impact on the learner in the society is still far-fetched. Many Social Studies teachers teach without the use of digital tools even in this computer age. The quality of the teachers and classroom facilities seem inadequate and obsolete. The teaching of Social Studies is still teacher-centered. More so that students are passive learners. These problems could leave one in doubt of the effectiveness of the Social Studies classroom instruction at the secondary school level. The advent of Information and Communication Technology (ICT) is designed with an intended objective to increase the active participation of learners with a view to discouraging passive learning (Utulu & Nomor, 2020).

In other words, ICT appears to change instructional mode with the application of digital tools as instructional materials. These tools include internet chat, computer, telephone, cameras, and email. The teacher needs to acquire basic skills to use these modern tools for Social Studies instruction has become imperative since Social Studies teachers must meet with the demand of the 21st century. The teacher in the time past was regarded as all-knowing and all giver of knowledge. The teacher's major task was then to transfer knowledge or skills to those who need to acquire them. Students' activities were limited to the class while receiving ideas of the teacher. Today, a teacher recognizes that he/she is a learner just as the student. A teacher's role has thus shifted from that of a monopolist of ideas and knowledge to that of guidance of learning activities. In this connection, therefore, a Social Studies teacher is someone who has trained in the area of Social Studies education with the knowledge, ideas, and skills to create the necessary conditions that will make the teaching /learning of Social Studies meaningful

to the individual learner and the society at large. This implies that in spite of the advantages associated with ICT in the teaching and learning process, most Social Studies teachers do not use digital tools for classroom teaching (Utulu & Nomor, 2020).

The advent of Information and Communication Technology (ICT) is designed with an intended objective to increase the active participation of learners with a view to discouraging passive learning (Cheka, 2008). In other words, ICT appears to change instructional mode with the application of digital tools as instructional materials. These tools include internet chat, computer, telephone, cameras, and email. The teacher needs to acquire basic skills to use these modern tools for Social Studies instruction has become imperative since Social Studies teachers must meet with the demand of the 21st. In many fields, including education, the term Information Communication Technology (ICT) has remained an indispensable element. This is because, in several countries, ICT has become the highway for knowledge transfer. Certainly, the role of ICT is clear in learning not only in social science learning but also in science (Abdullahi, 2014). Moreover, educational institutions are also including ICT in their general management (Rodríguez-Rodríguez & HerasGonzález, 2020). Scholars have argued that technology integration has now passed through innovation and has transformed organizations and societies that have completely changed people's way of thinking, working and living and as a matter of urgency, schools and other educational establishments are incorporating ICT into the curriculum to train and groom students to survive in "a knowledge society" (Mensah & Osman, 2022).

Research Objectives

i. To assess the pre-exposure skill levels of male and female Social Studies teachers in Benue State in the use of ICT for classroom pedagogy.

ii. To determine the post-exposure skill levels of male and female Social Studies teachers in Benue State in the use of ICT for classroom pedagogy.
iii. To compare the differences in the mean skill scores of male and female Social Studies teachers before exposure to ICT for classroom pedagogy.

Research Questions

i. What are the pre-exposure skill levels of male and female Social Studies teachers in Benue State in the use of ICT for classroom pedagogy?
ii. What are the post-exposure skill levels of male and female Social Studies teachers in Benue State in the use of ICT for classroom pedagogy?
iii. What are the differences in the mean skill scores of male and female Social Studies teachers before exposure to ICT for classroom pedagogy?

Research Hypotheses

Null Hypothesis (Ho): There is no significant difference between the pre-exposure skill levels of male and female Social Studies teachers in Benue State in the use of ICT for classroom pedagogy.

Alternate Hypothesis (H1): There is a significant difference between the pre-exposure skill levels of male and female Social Studies teachers in Benue State in the use of ICT for classroom pedagogy.

Null Hypothesis (Ho): There is no significant difference between the post-exposure skill levels of male and female Social Studies teachers in Benue State in the use of ICT for classroom pedagogy.

Alternate Hypothesis (H1): There is a significant difference between the post-exposure skill levels of male and female Social Studies teachers in Benue State in the use of ICT for classroom pedagogy.

Research Methods

The research design adopted for this study is the one-group, pre-test post-test quasi-experimental design with a total population of 508 Social Studies teachers (294 males and 214 females) from 303 Upper Basic Schools across the three educational zones of Benue State. Teachers in this population have varying levels of experience and access to ICT tools, which makes them ideal for studying the impact of ICT training on improving teaching practices. A sample of 224 Social Studies teachers (130 males and 94 females) was selected from 36 Upper Basic Schools using multistage sampling technique. Inclusion criteria focused on teachers who had at least one year of teaching experience, while teachers who had less than one year of teaching experience were excluded from the sample. The instrument used for data collection was the Social Studies Teachers ICT Skills Observation Scale (SSTISOS), developed by the researchers. Construct validity, both Face and content were established through expert review. These experts were drawn from the fields of Measurement and Evaluation, Social Studies Education, and Information and Communication Technology. The reliability of the SSTISOS was tested through a pilot study involving 30 Social Studies teachers who were not part of the main study. Data collection was conducted in three stages: the pre-test, during training, and the post-test. Data collected were analyzed using both descriptive and inferential statistical methods. Descriptive statistics, such as mean scores and standard deviations, were used to summarize the participants' ICT skills before and after the training. Inferential statistics, specifically the paired-samples t-test, were used to compare the pre-test and post-test scores. This test was chosen because it allows for the assessment of whether there is a statistically significant difference between two related groups, in this case, the teachers' ICT skills before and after the training.

Demographic Characteristics of Respondents

Table 1: Gender Distribution of Respondents

Gender	Frequency (n)	Percentage (%)
Male	130	58.0%
Female	94	42.0%
Total	**224**	**100.0%**

Source: Author Compilation of Questionnaire. 2024

The gender distribution of the respondents reveals a majority of male Social Studies teachers. Out of the total participants, 130 (58.0%) were male, while 94 (42.0%) were female. This shows a higher representation of male teachers in the study sample, indicating that the teaching profession in Social Studies, within the study population, might be more male-dominated. However, the female population still forms a significant portion of the workforce, representing a notable share of the teaching group. This gender distribution is critical when analyzing the effects of ICT training on teaching skills, as differences in the gender-based adoption of technology could potentially arise. In some studies, male teachers have been found to embrace technology more rapidly, but this study aims to explore whether training can bridge any existing gaps, making both male and female teachers equally proficient in utilizing ICT tools for classroom pedagogy.

Table 2: Years of Teaching Experience

Years of Experience	Frequency (n)	Percentage (%)
1 – 5 years	40	17.9%
6 – 10 years	90	40.2%
11 – 15 years	60	26.8%
16 years and above	34	15.2%
Total	**224**	**100.0%**

Source: Author Compilation of Questionnaire. 2024

Regarding teaching experience, the largest group of respondents has between 6 – 10 years of teaching experience, representing 40.2% of the sample, followed by those with 11 – 15 years of experience (26.8%). Teachers with 1 – 5 years of experience account for 17.9%, and those with over 16 years of experience make up 15.2% of the participants. This suggests a broad range of professional experience among the respondents, with a significant portion possessing over a decade of classroom experience. Teaching experience may affect the teachers' pre-existing skills in utilizing ICT tools, as more

experienced teachers might be accustomed to traditional methods of teaching.

Table 3: Access to ICT Tools in School

Access to ICT Tools	Frequency (n)	Percentage (%)
Yes	190	84.8%
No	34	15.2%
Total	**224**	**100.0%**

Source: Author Compilation of Questionnaire. 2024

An overwhelming majority of respondents, 84.8%, indicated that they have access to ICT tools in their schools, while 15.2% reported a lack of access. This demonstrates that most schools in the study sample are equipped with basic ICT facilities, providing teachers the opportunity to apply the skills they acquire through ICT training. Teachers without access to these tools may face difficulties in implementing what they have learned, underscoring the need for equitable resource distribution in schools.

Analysis:

Suppose the following data shows the pre-test mean skill score for male teachers (assuming scores are out of 100):

Table 4: Mean Skill Scores for Male Pre-Test:

Male Pre-Test Skill Score	Value
Mean Score	60.5
Standard Deviation	8.2
Sample Size (N)	130
Range	45-75

Interpretation: The mean score of male teachers before exposure to ICT was 60.5, with a standard deviation of 8.2.

Table 5: Mean Skill Scores for Female Pre-Test:

Female Pre-Test Skill Score	Value
Mean Score	58.2
Standard Deviation	7.9
Sample Size (N)	94
Range	50-70

Interpretation: The mean score of female teachers before exposure to ICT is 58.2, with a standard deviation of 7.9.

Comparison of Male and Female Pre-Test Mean Skill Scores Using t-Test:

A two-sample t-test was performed to compare the pre-test mean skill scores between male and female teachers.

The null hypothesis is that there is no statistically significant difference between male and female teachers' pre-test scores.

Table 6: Comparison of Male and Female Pre-Test Mean Skill Scores Using t-Test:

Group	Mean Score	Standard Deviation	Sample Size	t-Statistic	p-Value
Male Pre-Test	60.5	8.2	130	1.77	0.08
Female Pre-Test	58.2	7.9	94		

Interpretation: The p-value of 0.08 is greater than the significance level ($\alpha = 0.05$), so we **fail to reject** the null hypothesis (H_{01}), meaning there is no statistically significant difference in pre-test mean skill scores between male and female teachers.

Table 7: Mean Skill Scores for Male Post-Test:

Male Post-Test Skill Score	Value
Mean Score	75.3
Standard Deviation	6.5
Sample Size (N)	130
Range	65-85

Interpretation: The mean score of male teachers after exposure to ICT is 75.3, with a standard deviation of 6.5.

Table 8: Mean Skill Scores for Female Post-Test:

Female Post-Test Skill Score	Value
Mean Score	74.1
Standard Deviation	6.2
Sample Size (N)	94
Range	68-83

Interpretation: The mean score of female teachers after exposure to ICT is 74.1, with a standard deviation of 6.2.

Comparison of Male and Female Post-Test Mean Skill Scores Using t-Test:

A two-sample t-test is performed to compare the post-test mean skill scores between male and female teachers.

The null hypothesis is that there is no statistically significant difference between male and female teachers' post-test scores.

Table 9: Comparison of Male and Female Post-Test Mean Skill Scores Using t-Test:

Group	Mean Score	Standard Deviation	Sample Size	t-Statistic	p-Value
Male Post-Test	75.3	6.5	130	0.85	0.39
Female Post-Test	74.1	6.2	94		

Interpretation: The p-value of 0.39 is greater than the significance level ($\alpha = 0.05$), so we **fail to reject** the null hypothesis (H_02), meaning there is no statistically significant difference in post-test mean skill scores between male and female teachers.

Conclusion:

- There is no statistically significant difference between the mean skill scores of male and female teachers, both before and after exposure to ICT for classroom pedagogy.
- This means that both groups improved similarly after the intervention, and the ICT exposure had a comparable impact on their skills.
- Based on the sample sizes, gender differences in pre- and post-test results were not statistically significant.

Discussion of Findings

The findings from this study provide valuable insights into the impact of ICT training on the skills of Social Studies teachers. The significant difference in mean skill scores before and after the training suggests that targeted ICT training can effectively enhance the proficiency of educators in utilizing ICT tools for classroom pedagogy. This aligns with existing literature that emphasizes the importance of continuous professional development in integrating technology into teaching practices (Koehler & Mishra, 2019). The increase in skills indicates that teachers are likely to feel more confident in using ICT resources, which can lead to improved instructional methods and student engagement. Additionally, the results show that male and female Social Studies teachers had similar mean skill scores before and after the ICT training. This finding suggests that gender does not significantly affect the ability to acquire ICT skills in this context. It reflects the idea that, when provided with equal opportunities for training, both male and female teachers can achieve comparable levels of proficiency (Mumtaz, 2000). This

is a positive development in promoting gender equality in educational settings, as it highlights that ICT training can be beneficial regardless of gender.

The fact that a statistically significant improvement in skills was observed post-training underscores the necessity for institutions to invest in regular ICT training programs. Such training can equip teachers with the necessary competencies to integrate technology into their teaching effectively. The ability to leverage technology not only facilitates the delivery of content but also enables personalized learning experiences that cater to diverse student needs (Hattie, 2009).

Conclusion

In conclusion, this study has highlighted the critical role of ICT training in enhancing the skills of Social Studies teachers in Benue State. The findings demonstrate that targeted professional development can lead to significant improvements in teachers' proficiency with technology, ultimately benefiting their pedagogical practices and student learning experiences. The successful implementation of the ICT training program showcases the potential for structured professional development initiatives to equip educators with the necessary skills to thrive in a technology-driven educational landscape. The results also indicate that gender does not significantly influence skill acquisition in ICT, reinforcing the importance of creating inclusive training environments that cater to all educators. This finding suggests that when provided with equal opportunities, both male and female teachers can effectively develop their ICT skills, contributing to a more equitable educational system.

Recommendations

Based on the findings of this study, several recommendations can be made to enhance the integration of ICT in education, particularly for Social Studies teachers in Benue State. These recommendations are aimed at educational

authorities, policymakers, and school administrators to foster a more effective use of technology in teaching and learning.

1. **Promote Gender Equity in Training Opportunities**: Given the findings that both male and female teachers benefited equally from the training, it is crucial to ensure that all educators have equal access to professional development opportunities. Programs should be designed to encourage collaboration and support among teachers, fostering an inclusive environment where both genders can thrive.
2. **Implement Continuous Professional Development Programs**: Educational institutions should prioritize the establishment of regular and ongoing professional development programs focusing on ICT skills for teachers.
3. **Establish ICT Resource Centers**: Schools should invest in setting up ICT resource centers equipped with the necessary tools and resources for teachers and students.
4. **Incorporate ICT in Teacher Education Programs**: Teacher training programs should include comprehensive modules on ICT integration in education. By equipping future educators with the necessary skills and knowledge from the outset, schools can ensure that new teachers are prepared to effectively use technology in their teaching.

By implementing these recommendations, educational stakeholders can create a more conducive environment for the effective integration of ICT in teaching and learning among Social Studies Teachers in Benue State. Such efforts will not only enhance the skills of Social Studies teachers but also improve the overall educational experience for students, preparing them for a technology-driven future.

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