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Teachers' Skills in the Improvisation of Instructional Materials for Teaching Computer Studies in Junior Secondary School

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ABSTRACT

Improvisation can be an essential skill for teachers, especially in resource-constrained educational environments. The study investigated the skills of teachers in Egor Local Government Area of Edo State to improvise instructional materials for teaching when conventional resources are unavailable. Using a descriptive survey research design, the study sampled 102 teachers from 12 public Junior secondary schools. Data were collected through a structured questionnaire divided into sections addressing demographic information and the variable of interest. The instrument, validated by experts, achieved a reliability coefficient of 0.780 through Cronbach's Alpha. Mean and standard Deviation was used to answer research question 1, t-test was used to test hypothesis 1 and ANOVA was used to test Hypothesis 2. at a 0.05 significance level. The findings revealed that teachers in the study area possess adequate improvisation skills, enabling them to adapt their teaching methods effectively in diverse situations. Teachers demonstrated the ability to create alternative instructional materials and found no variation in these skills based on gender, as male and female teachers exhibited similar proficiency levels in improvising teaching resources among others. Moreover, the study concluded that educational qualifications do not affect teachers' improvisation abilities. Teachers across various qualification levels were equally adept at creating instructional materials. This uniformity suggests that the ability to improvise is a skill that transcends formal qualifications.

Keywords: Teachers, Skills, Improvisation, Instructional Materials, Teaching, Computer Studies

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INTRODUCTION

Education all over the world has been described as the bedrock of societal growth and innovation, and its effectiveness often hinges on the availability and utilization of suitable instructional materials. For a subject like computer studies, which requires both theoretical knowledge and practical application, the ability of teachers to create or adapt instructional

resources is crucial. In many educational settings, especially where resources are scarce, teachers' skills in improvisation can bridge the gap between limited materials and the need for quality education.

Computer studies as a field of education provides individuals with the knowledge and skills to understand and utilize computer systems effectively. This discipline focuses on areas such as programming, hardware and software design, networking, data analysis, and cybersecurity. It equips learners with the ability to solve problems, develop innovative solutions, and adapt to technological advancements. The applications of computer studies are vast and highly relevant in today's digital age (Boss & Krauss, 2022). From designing software and managing databases to developing mobile apps and securing online networks, the demand for expertise in computer studies continues to grow. The computer studies curriculum in Nigeria is crafted to provide students with foundational skills in digital literacy and technological knowledge (Bello & Ajao, 2024). It includes topics such as basic computer operations, word processing, spreadsheets, databases, and presentations, offering a comprehensive understanding of how technology functions in various applications. Beyond these basics, students are introduced to programming concepts, internet use, and cybersecurity, helping them navigate the digital world with confidence and awareness. This structured approach enables learners to build practical skills, preparing them to address everyday technological challenges effectively. This curriculum focuses on fostering creativity, problem-solving, and critical thinking among students. Through practical, hands-on experiences, learners gain the ability to apply their knowledge to real-world scenarios, making them better prepared for further studies and future careers in technology (Aithat & Mishra, 2024). By integrating theoretical knowledge with practical application, the program equips students with the competencies needed to thrive in the modern digital age, ensuring they remain relevant in an increasingly tech-driven society.

In the educational system, teaching is the process of imparting knowledge, skills, and values to learners in a structured manner (Ogunwuyi et al, 2024). It serves as a foundational pillar for personal and societal development, helping individuals grow intellectually, emotionally, and socially. Teaching involves various strategies and techniques aimed at facilitating learning, engaging students, and fostering critical thinking (Adeoye, et al, 2024). At its core, it is a dynamic interaction between educators and learners, with the goal of nurturing curiosity and understanding. Teachers play a central role in shaping the experiences and outcomes of education, adapting their approaches to meet the diverse needs of students. In the past, teaching relied heavily on traditional methods that were centered around direct instruction and rote memorization (Okpara & Ezeador, 2024). Teachers were considered the sole authority in the classroom, delivering lectures while students listened and took notes. This approach often involved using blackboards, textbooks, and standardized assessments to convey and evaluate knowledge. Traditional teaching emphasized discipline and a rigid structure, focusing on core academic subjects. While this method was effective in instilling basic literacy and numeracy skills, it often lacked interactive elements and failed to encourage creativity or independent thought among learners. In modern times, teaching has transitioned to incorporate innovative and interactive methods that prioritize student engagement and active participation. Modern

teaching methods leverage technology, such as computers, tablets, and online platforms, to create a more dynamic and collaborative learning environment. Teachers now use techniques like group discussions, project-based learning, and multimedia presentations to cater to various learning styles. These methods encourage critical thinking, problem-solving, and creativity while fostering a more inclusive and personalized educational experience. As a result of this, Teachers may encounter situations where standard teaching tools are unavailable or insufficient to convey specific concepts effectively. Improvising instructional materials becomes necessary to address the diverse needs of learners and overcome limitations in resources.

Improvisation has had a history of being a creative approach to solving problems by utilizing available resources effectively. It involves finding innovative ways to achieve goals when conventional tools or methods are not accessible (Adetunji, 2023). This concept is widely applied in various fields, including education, where it fosters flexibility and resourcefulness. The improvisation of instructional materials plays a key role in bridging gaps when standard teaching aids are unavailable. Improvisation of instructional materials refers to the creative process of designing or adapting teaching aids using locally available resources when standard materials are unavailable or insufficient. Instructional materials are tools and resources used by educators to enhance teaching and learning processes, making lessons more engaging and easier to understand. These materials are categorized into three main types: visual, audio, and audiovisual. Visual materials include charts, maps, and diagrams, which help learners grasp complex ideas through illustrations. Audio materials like recordings and podcasts aid in improving listening skills, while audiovisual tools, such as videos and interactive software, combine sound and visuals to provide a comprehensive learning experience. Improvisation becomes necessary when these materials are unavailable due to financial or logistical constraints. Teachers can creatively use locally available resources to replicate the functionality of standard instructional materials. Example can be seen when a teacher in a rural school utilizes locally crafted clay models to demonstrate geometric shapes, ensuring students still receive quality education despite resource limitations.

The relationship between teachers' skills and the improvisation of instructional materials cannot be overemphasized. Skills refers to the ability to perform tasks effectively and efficiently, often developed through practice, training, and experience (Qizi, 2020). Skills can be technical, interpersonal, or cognitive, depending on the field or task. For teachers, skills are critical tools that enable them to effectively deliver knowledge, engage students, and manage classrooms. Teachers' skills include their capacity to communicate ideas clearly, inspire curiosity, adapt to diverse learning needs, and foster a positive learning environment (Abubakar, 2024). In the 21st century, teaching requires specific core skills to meet the dynamic demands of modern education. These include adaptability to integrate technology in classrooms, the ability to foster critical thinking and problem-solving among students, and cultural competence to manage diverse classrooms effectively. Teachers must also possess strong emotional intelligence to support students' mental and emotional well-being while creating inclusive and engaging environments. Collaboration and communication skills are essential for building relationships with

students, parents, and colleagues. The ability of teachers to improvise instructional materials is crucial for effective teaching and learning (Olarewaju et al, 2021). Improvised materials allow teachers to adapt to situations where standard resources are unavailable or insufficient (Adamu, 2024). This skill ensures that students can grasp concepts through creative and relatable examples, using locally available items. By improvising, teachers make learning interactive and engaging, helping students connect theory to practical experiences, which fosters better understanding and retention of knowledge. When teachers can create instructional materials from their environment, they address the challenges of resource constraints, particularly in underfunded schools (Chigbu & Adamu, 2023). These materials can be tailored to meet the specific needs and interests of their students, accommodating different learning styles. For instance, using items like bottle caps for counting in mathematics or illustrating scientific principles with common household objects allows students to learn with resources that are familiar to them. This approach not only bridges resource gaps but also encourages critical thinking and creativity among students. By demonstrating how to use what is available to achieve goals, they instill the value of adaptability and innovation. These skills are essential for students, not only in their academic pursuits but also in real-life problem-solving.

Despite the enjoyed benefit of the improvisation in the educational sphere (Obidike, 2021; Adamu & Ali, 2021; Abubakar, 2024; Mbaba & Atuzie, 2024), there is a rarity of study on teachers' skills in the improvisation of instructional materials for the teaching of computer studies. It is against this backdrop that the study aims to bridge this gap by exploring teachers' skills in the improvisation of instructional materials for the teaching of computer science.

Research Questions

To guide the study, three research questions were raised:

1. Do teachers have the skills to improvise instructional materials for teaching?
2. Is there any difference in teachers' skills to improvise instructional material for teaching based on sex?
3. Is there any difference in teachers' skills to improvise instructional material for teaching based on qualification?

Hypotheses

The following null hypotheses were formulated for this study:

$H_{O1:}$ there is no significant difference in teachers' skills to improvise instructional material for teaching based on sex?

H_{02}: there is no significant difference in teachers' skills to improvise instructional material for teaching based on qualification?

METHODS

The study employed a descriptive survey research design to explore its objectives. The population for the research comprised 118 teachers from 12 public Junior Secondary

schools in Egor Local Government Area of Edo State. A sample of 102 teachers, including both male and female participants, was randomly selected for the study. Data was collected using a structured questionnaire, divided into two sections: A and B. Section A gathered demographic information such as gender and qualifications, while Section B focused on the variable of interest. The questionnaire items were designed as closed-ended Likert scale questions, rated on a 4-point scale: Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD). The instrument underwent validation by three experts from the Department of Curriculum and Instructional Technology, University of Benin. To ensure reliability, Cronbach's Alpha statistics was used on twenty administered instruments who were not parts of the main study but from the same population, yielding a reliability coefficient of 0.780, indicating a reliable measure. Data collected were analyzed using descriptive statistics of mean and standard deviation for the research questions. The hypotheses were tested using the t-test statistics and Analysis of Variance (ANOVA) at a significance level of 0.05.

RESEARCH RESULTS

Research Question 1: Do teachers have the skill to improvise instructional materials for teaching?

Table 1: *Mean and standard Deviation of Scores from Teachers on the Skill to Improvise Instructional Materials for Teaching*

S/N	Questionnaire Items	N	Mean	SD	Decision
1.	I observe what experience people have done and copy their responses with minimal variation.	102	2.96	.39	Agree
2.	I actively collaborate with my colleague and share ideas for improvising instructional material.	102	3.35	.62	Agree
3.	I often find myself seeking innovative ways to improvise instructional materials rather than relying on traditional methods.	102	3.35	.75	Agree
4.	I actively collaborate with colleagues to brainstorm and share ideas for improvising instructional materials.	102	3.29	.68	Agree
5.	I use inputs from my immediate environment to develop instructional materials.	102	3.17	.82	Agree
6.	Input from people reactions help me to develop improvised instructional material.	102	3.03	.74	Agree
7.	I gather relevant waste materials and skills to improvised instructional material.	102	2.82	.88	Agree
8.	I regularly seek feedback from students on the effectiveness of improvised instructional materials in meeting their learning needs	102	3.25	.68	Agree
9.	I carefully review improvised material that would be suitable for my lesson.	102	3.50	.50	Agree

10	I am calm and creative when developing improvised instructional material for my lesson	102	3.33	.62	Agree
11	I am comfortable with taking risks and experimenting with new ideas when improvising instructional materials	102	3.18	.72	Agree

Grand Mean=35.23/11=3.20

The table 1 reveals the mean and standard deviation of scores from teachers on the skill to improvise instructional materials for teaching. The table shows a mean range from 2.96 - 3.55, as well as a standard deviation ranging from 0.39 - 0.88 on teachers' skill to improvise instructional materials for teaching respectively. From the data analyzed in table 1, all items showed agreement among respondents. It therefore shows that teachers do have the skills to improvise instructional materials for teaching.

Hypothesis 1: There is no significant difference in teachers' skills towards improvisation of instructional materials for teaching based on sex

Table 2: *Independent Samples t-test Result on the Difference in Teachers' Skills toward Improvisation of Instructional Material for Teaching based on Sex*

Variable	**N**	**$\overline{X}$**	**SD**	**Df**	**t**	**Sig (2-tailed)**	**Decision**
MALE	9	5.6667	.86603	98	1.686	.095	H_0 Accepted
FEMALE	91	6.1758	.86401				

Table 2 showed the independent samples t-test statistics' result for the difference in teachers' skills toward improvisation of instructional materials for teaching based on sex. From the table, the number of male teachers were N= 9, while for the female teachers, they were N=91. Their mean values are 5.6667 and 6.1758, while their standard deviations are .86603 and .86401 respectively. The degree of freedom is 98, t-value is 1.686, and p-value is .095. Testing at an alpha level of .05, the p-value is greater than the alpha level, so the null hypothesis which states "there is no significant difference in teachers' skills toward improvisation of instructional material for teaching based on sex," was retained. This implies that neither the male nor female teachers' skills toward improvisation of instructional materials for teaching was more than the other.

Hypothesis 2: There is no significant difference in teachers' skills towards the improvisation of instructional material for teaching based on qualification

Table 3*: Summary of ANOVA Analysis on the Difference in Teachers' Skills Towards the Improvisation of Instructional Material for Teaching based on Qualification*

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	2.322	3	.774	1.028	.384
Within Groups	73.757	98	.753		

The table 3 shows the ANOVA analysis on the difference in teachers' skills towards the improvisation of instructional material for teaching based on qualification. It can be seen that the f-value is 1.028 with a degree of freedom of degree 3 and the level of significance is .384 which is more than the set alpha level of 0.05. Thus, the null hypothesis which states that there is no significant difference in teachers' skills towards the improvisation of instructional material for teaching based on qualification is retained.

Discussion

The findings from this study provide valuable insights into teachers' skills in improvising instructional materials in Egor Local Government Area and the factors that may influence these skills. With regard to research question one, the study revealed that teachers possess adequate skills in the improvisation of instructional materials. The consistency in respondents' agreement, reflected in the mean and standard deviation values, demonstrates that teachers are not only capable of making use of available instructional resources but are also competent in developing alternatives when standard materials are lacking. This ability is particularly essential in resource constrained educational settings, where creative improvisation becomes a necessary strategy for enhancing teaching effectiveness and ensuring meaningful learning experiences for students.

The second research question examined whether sex influences teachers' improvisation skills. The independent t-test analysis showed that there was no statistically significant difference between male and female teachers. The p-value exceeded the predetermined alpha level, leading to the conclusion that gender does not determine the ability to improvise instructional materials. Both male and female teachers exhibited similar competencies, suggesting that improvisation is a neutral skill that can be developed by all teachers regardless of sex. This finding supports the notion that creativity and adaptability in instructional planning are universal professional attributes rather than gender-based traits.

Finally, research question three investigated whether teachers' qualification levels influence their ability to improvise instructional media. The ANOVA results indicated that no significant differences existed among teachers with varying qualifications. The level of significance was greater than the alpha value, which warranted the retention of the null hypothesis. This implies that teachers, irrespective of their academic qualifications, possess comparable improvisation skills. This outcome highlights the possible role of practical experience, on the job training, and professional development activities in equipping teachers with the abilities required for effective instructional improvisation. It suggests that hands-on exposure may be more influential than formal academic levels in developing these essential teaching competencies.

Conclusion

From the result of the study, it was concluded that teachers in Egor Local Government Area possess the necessary skills for improvising instructional materials. The findings revealed

that teachers can effectively create alternative teaching resources when conventional materials are unavailable. This capability is crucial for adapting to diverse teaching environments, particularly those with limited resources. The data analysis indicated a consistent agreement among respondents, showing that improvisation skills are a valuable and prevalent asset among teachers in the area. Additionally, it was concluded that neither gender nor educational qualifications significantly influence teachers' improvisation skills. Male and female teachers demonstrated comparable proficiency in creating instructional materials, as evidenced by the statistical analysis. Similarly, the study found that teachers' ability to improvise instructional materials remains consistent across different qualification levels.

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