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ORIGINAL RESEARCH

Utilization of teaching resources for efficient instructional delivery in data processing in senior secondary schools in Anambra state

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The purpose of this study is to investigate how teaching materials are used in senior secondary schools in Anambra state to facilitate effective data processing and instruction for respondents. The study employed a survey methodology. A total of 120 instructors and 18 pupils made up the 138 respondents who took part in the study's sample, which was employed in the analysis. A four-part questionnaire that was self-created was the study's primary tool. The instrument has been validated. Statistical Package for the Social Sciences version 22 was used to extract the data gathered from the respondents from the Google form and conduct the analysis. In order to determine the frequency and proportion of the entire population, the researcher employed descriptive analysis. Based on the analysis of the data collected, the researcher found that learning data processing becomes easier with the use of instructional materials. It was concluded that instructional materials have a greater advantage to the teacher and respondents. This study contributes to the existing literature on educational technology integration in Nigeria and specifically highlights the need for improved utilization of teaching resources for data processing education. By shedding light on the current state of affairs in Anambra state's senior secondary schools, the findings of this study can inform policymakers, school administrators, and educators on the effectiveness of instructional materials in teaching and learning data processing.

Keywords: instructional materials, effective teaching, effective learning, data processing

1. Introduction

Education is a behavioral characteristic that impacts information, skills, attitudes, and any other form that enables one to adapt and interact with others in a positive way. It is a behavioral quality as it causes people to change permanently. Associating appropriately with people from various countries, shifting from traditional behavior to more modest behavior, and acting as a catalyst for governmental concepts, programs, and laws have all benefited from it. It has also helped to lessen the problem of language barriers. By shifting knowledge from verbal expression to application, making learning more interesting, straightforward, and pleasurable, and boosting learning efficacy, instructional materials aid in teaching and learning (1). As a consequence, different continents have been allowed to modify their conventions and laws to make room for one another.

Instructional materials are essential tools used by educators to facilitate effective teaching and learning. These materials include textbooks, workbooks, visual aids, audiovisual resources, and digital platforms (2). They provide additional support, enhance student engagement, and promote active learning. Instructional materials help educators present information in a clear and organized manner, cater to diverse learning styles, and reinforce key

concepts. By incorporating these materials into instruction, educators can create dynamic and interactive learning experiences that foster student comprehension, skill development (3), critical thinking (4), and knowledge retention (5).

The usage of digital educational resources such as ICT-based simulation, animation, electronic textbooks, and learning objects in the teaching and learning process motivates and supports respondents to demonstrate a great interest in whatever subject the instructor decides to address (6, 7). Instructional materials may improve respondents' aptitude and make learning more relevant for them by providing them with clarity and recognition (8). In addition, they increase respondents' motivation to learn, help with assimilation and memorization of material, maintain focus, add fresh learning goals, make learning available to a wider audience, control the pace of studying, motivate greater comprehension, and assist in overcoming difficulties in the topic's presentation.

The use of computer-aided instruction has several benefits, one of which is that it fosters the resourcefulness, imagination, creativity of instructors, and effective data processing (9, 10). Unfortunately, it appears that Anambra state lacks sufficient educational resources, making teaching and learning activities theoretic, amorphous, and ineffective. Although the Nigerian government has prioritized instructional materials in creating activities and procedures aimed at raising respondents' learning standards, theoretical and empirical research has failed to capture the real reasons why the country's educational standards remain so low.

Data processing is one of the senior secondary elective subjects available in the state of Anambra. The significance of handling data involves improved judgments, higher production and revenues, and accuracy and dependability. Other benefits include further cost savings, simplicity of storage, distribution, and report creation, followed by enhanced analysis and presentation. Every area of employment has now understood the need of processing data (11). Systems that manage data are employed by every organization, whether the job is done for commercial purposes or academic study. It is a multifaceted process that affects practically every aspect of human life. The only way data processing can be engaging is if the right educational materials are applied. Otherwise, pupils will find teaching data processing to be abstract. There are fundamental questions that must serve as a guide in choosing the direction and concentration of the study in order to get to the heart of this examination. Therefore, the purpose of this study is to give answers to these questions:

1. How effective is the use of instructional materials in teaching and learning data processing?
2. How does the usage of instructional materials in teaching and learning data processing affect teacher performance in the classroom?
3. What are the available instructional materials used for effective teaching and learning of data processing in senior secondary schools?

2. Materials and method

The research methodology employed is a survey approach, and the research strategy is descriptive based on the specific study purpose. In order to describe the nature of the current conditions, create benchmarks against which the current conditions may be compared, or ascertain the connections between certain occurrences, a survey technique is used to collect data at a specified period. In survey research, a group of people or an object is examined by gathering and examining data from a small number of individuals or an item that is thought to be representative of the entire group. The success of this design in a comparable study provides justification for its implementation.

The investigation was conducted in a senior high school in the state of Anambra. Considering the small size of the sample, no random sampling method was adopted in this study. A four-part questionnaire that was self-created was the study's primary tool. There were two parts to the instruments. While part B contains the survey form along with the answers, section A provides demographic information about the respondents. Strongly Agree (SA = 4 points), Agree (A = 3 points), Disagree (D = 2 points), and Strongly Disagree (SD = 1 point) were the four-point scales that were used. The legitimacy of the items' faces and contents was guaranteed. Two professors from the Department of Education's Measurements and Evaluation were consulted for proofreading in order to evaluate, correct, and comment on the results. Their changes were then incorporated. It was decided to use a test–retest reliability estimate. Ten responders who were not in the sample received 10 copies of the questionnaire. The same group of participants had a second delivery of the device after 2 weeks. The Pearson product–moment correlation was used to rate the acquired data, and a score of 0.75 was achieved, indicating the questionnaire's dependability.

The study made use of original sources of data, in which the information was gathered directly by the investigator with a specific goal in mind. Google Forms was used to electronically deliver the survey to the respondents. An inexpensive method that may reach many responders who are in various locations is Google Forms. The main benefit of the questionnaire is that it allows respondents to freely express their opinions. The research featured 138 respondents in all, including 120 instructors and 18 pupils. The investigator employed the standard statistical approach

of analysis to analyze the data. The Statistical Package for the Social Sciences version 22 was used to extract the data gathered from the respondents from Google Forms and conduct the analysis. In order to determine the frequency and proportion of the entire population, the researcher employed descriptive analysis. In addition, it is used to calculate the percentage, mean, and standard deviation.

3. Results

3.1. Information on participants' demographics

In order to assess the extent to which the populations represented were of the overall population and how heterogeneous the participants were, demographic information was gathered as part of the questionnaire that was submitted. As a result, background data on respondents' ages, teachers' qualifications, the number of classes they have taught, their job experience, and the number of periods they have taught each week were gathered and examined as shown in **Table 1**.

Table 1 shows the respondents' age, teacher qualification, number of classes taught by the teacher, teacher work experience, and the number of periods taught by the teacher per week distribution, of the sample population. It shows that 77.77% of the student population was 15 years and above. The demographics also indicated that 65% of the teachers have B.Ed. qualification and 74.16% of the teachers are teaching data processing at the JSS level. The table also shows that 69.16% of the teachers have work experience of 5 years and above; meanwhile, 76.66% of the teachers cover four periods of teaching per week. From the above analysis, it can be inferred that majority of the respondents.

TABLE 1 | Demographic information of the trainee participants.

Item category		Frequency	Percent
Respondents' age.	10–15 years	4	22.22
	15 years and above	14	77.77
	Subtotal	*18*	
Qualification.	Post-graduate degree	21	17.5
	B.ED	78	65
	NCE	19	15.83
	TC11	2	1.66
	Subtotal	*120*	
Class taught.	JSS	89	74.16
	SSS	31	25.83
	Subtotal	120	
Work experience.	1–5 years	23	19.16
	6–10 years	83	69.16
	5 years and above	14	11.66
	Subtotal	*120*	
No. of periods taught per week.	3	12	10
	4	92	76.66
	5	16	13.33
	Subtotal	120	
Grand total		**138**	

Research question 1: How effective is the use of instructional materials in learning data processing?

From **Table 2**, the respondents agreed that the teacher has instructional material for every unit of data processing (3.33). It is obvious that learning data processing becomes easier with the use of instructional materials (3.17). Despite the aid of educational materials, those polled, nevertheless, maintained that data processing is engaging (2.00). Those with mean scores of 2.5 and higher were often approved, but those with mean scores below 2.5 were rejected.

Research question 2: How effective is the use of instructional materials in teaching data processing?

According to **Table 3**, all participants concurred that the use of variety and suitable teaching materials greatly enhances the respondents' learning (3.75). The respondents did not agree that using learning resources had no impact on the respondents' performance (1.88). Those with mean scores of 2.5 and higher were often approved, but those with mean scores below 2.5 were rejected.

Research Question 3: What are the available instructional materials used for effective teaching and learning of data processing in senior secondary schools?

From **Figure 1**, respondents agreed that diagrams (73.9%), posters (65.21%), flash cards (21.74%), overhead projector (15.21%), tape recorder (32.6%), television (28.26%), electronic board (13.04%), chalk board (52.17%), Internet (34.78%), computer (43.47%), film strip (39.13%), pictures (69.56%), and read object (47.82%) are used for effective teaching and learning of data processing in senior secondary schools.

4. Discussion of findings

The utilization of instructional resources in teaching and learning data processing was studied in Research Question 3. According to Alciso et al. (12), instructional resources are crucial because they aid the teacher and respondents in avoiding an excessive emphasis on repetition and rote learning, which can easily take over a lesson. The investigator discovered that the instructor has teaching resources for every unit of data processing. The survey also revealed how well the teacher's teaching materials explain the subject matter. This conclusion is consistent with earlier studies by Jakwa (13), who discovered that learning resources give respondents the opportunity to get practical experience that aids in the development of ideas and abilities as well as a diversity of work styles. This study showed that learning

TABLE 2 | The use of educational materials related to data processing in educational settings.

No		SA	A	D	SD	Total	EX	Mean	Std. Dev.	Decision
1	The teacher uses instructional materials to teach us data processing.	5	8	3	2	18	52	2.89	0.93	Accepted
2	The instructional materials the teacher uses illustrate the content very well.	8	4	5	1	18	55	3.06	0.97	Accepted
3	Learning data processing becomes easier with the use of instructional materials.	11	2	2	3	18	57	3.17	1.17	Accepted
4	Does the teacher have instructional material for every unit of the data processing.	9	7	1	1	18	60	3.33	0.82	Accepted
5	Data processing is fascinating even without the aid of learning resources.	1	3	9	5	18	36	2.00	0.82	Rejected
6	The usage of instructional materials aids in the retention of learning results.	9	6	2	1	18	59	3.28	0.86	Accepted

TABLE 3 | Effectiveness of the use of instructional materials in teaching and learning data processing.

No		SA	A	D	SD	Total	EX	Mean	Std. Dev.	Decision
1	Instructional materials are used in teaching data processing.	33	78	7	2	120	382	3.18	0.6	Accepted
2	Instructional materials are used to teach every unit of data processing.	67	30	11	12	120	392	3.27	0.98	Accepted
3	The school makes it point of duty to provide adequate instructional materials.	55	58	5	2	120	406	3.38	0.65	Accepted
4	Improvisation is used in the absence of the actual material where necessary.	70	37	12	1	120	416	3.47	0.71	Accepted
5	My lesson is more concrete and clear because of the usage of instructional materials.	45	64	8	3	120	391	3.26	0.69	Accepted
6	Respondents' engagement in the teaching and learning process is enhanced by the usage of instructional resources.	46	61	11	2	120	391	3.26	0.68	Accepted
7	There is no difference in the performance of the respondents when I use instructional materials.	10	22	32	56	120	226	1.88	0.98	Rejected
8	Instructional materials are not significant in teaching data processing language.	8	9	80	23	120	242	2.02	0.73	Rejected
9	The use of varieties and appropriate instructional materials makes the learners benefit a lot from my teaching.	100	12	6	2	120	450	3.75	0.62	Accepted
10	Teaching data processing is interesting with or without instructional materials.	22	12	22	64	120	232	1.93	1.2	Rejected

data processing becomes easier with the use of instructional materials. Most of the participants disagreed that data processing is intriguing even without the aid of educational materials. To create better teaching strategies, teachers must understand how each student learns differently and modify their instruction to meet their needs by utilizing a variety of teaching techniques.

The usefulness of instructional materials in teaching data processing was covered in Research Question 2. All of the respondents agreed that using instructional materials increases respondents' involvement in the teaching and learning process. This is in line with the recommendations made by Adams and Onwadi (14), who suggested that teachers should utilize instructional materials interactions to stimulate active student engagement in class activities. Inadequate student involvement in class has caused instructors great anxiety. Ademiluyi (15) underlined that actual instructional resources, which serve as the medium of communication and encourage student engagement, are manipulatable by teachers. Overall, those surveyed claim

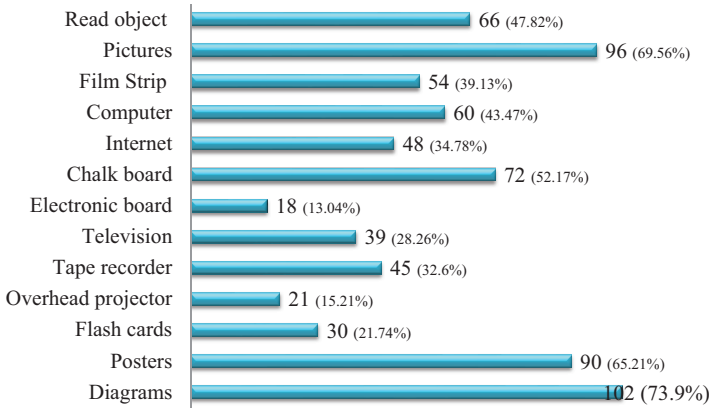

FIGURE 1 | Available instructional materials used for effective teaching and learning of data processing in senior secondary schools.

that their teaching is made more clear and genuine by the use of instructional resources. Similar findings were made by Usman and Madudili (8), who found that instructional materials are crucial and important instruments required for teaching and learning school topics in order to increase respondents' performance and foster instructors' efficiency. In addition, it provides all respondents in a class with the chance to share perspectives essential for new learning and aids in making learning more lasting by clarifying crucial ideas to pique and maintain respondents' interests.

The third research topic focused on the teaching tools that may be employed for instruction and data processing in senior high school. In a related study, Dahiru et al. (2) maintained that illustrations can be utilized to convert text-based information and data into an illustration. Based on the evaluation, participants agreed that illustrations (73.9%) are the most available resources for teaching and learning data processing in senior secondary schools. A graphic is also more likely to capture the learners' interest than a lengthy text. Diagrams aid respondents whose memory is more visual than spoken in greater remembering of the material being presented. The least common instructional tool used to teach and learn data processing in senior secondary schools is the electronic board (13.04%). Rice and Ortiz (1) stated that, due to the epileptic power supply in the majority of schools, digital teaching resources are becoming a less desirable resource for instructors. However, instructors are missing access to instructions on how to choose and assess electronic teaching resources for use in the classroom. This could hinder the process of learning how to instruct using digital resources.

5. Conclusion

This study examined the utilization of teaching resources for efficient data processing learning and instruction in senior secondary schools in Anambra state. The findings highlighted several key points. First, the current utilization of teaching resources for data processing education is suboptimal, primarily due to limited access to technology and a lack of training opportunities for teachers. This inequitable distribution of resources further exacerbates educational disparities between urban and rural schools. The study's examination of the data showed that the instructor does a great job of illuminating the subject matter with the help of instructional tools. The findings of this investigation also demonstrated that every data processing unit is taught using learning resources.

The study also emphasizes the importance of ongoing research and evaluation to monitor the effectiveness of interventions and identify areas for further improvement. By continuously assessing and adapting teaching resource utilization strategies, educators can provide enhanced learning experiences and improve student outcomes in data processing education. It implies that, as they limit verbalism, teaching materials are more advantageous to the instructor. As it contributes to successful teaching and learning, the use of instructional material in the classroom is vital. Despite the efficacy that using learning materials can have, some issues, such as improper usage of electronic-based instructional resources, work against the successful use of learning tools. It is disheartening to hear that some of these materials are scarce or even lacking in our schools. Some teachers even make use of them when available. Some find it difficult to carry the instructional material into the class when teaching and this affects the respondents' learning.

6. Educational implications

The findings of this study have several educational implications for the utilization of teaching resources in data processing learning and instruction in senior secondary schools in Anambra state. The study highlights the need to improve access to technology, such as computers, software, and internet connectivity, in schools. Educational policymakers should prioritize providing necessary technological infrastructure to all schools, particularly in rural areas, to ensure equitable access to teaching resources

for data processing education. The study emphasizes the importance of providing comprehensive training and professional development opportunities for teachers. Educators should be equipped with the necessary skills and knowledge to effectively integrate teaching resources into their instructional practices. Ongoing training programs should be designed to enhance teachers' understanding of data processing concepts and their ability to use relevant resources in a meaningful way.

The study underscores the need for equitable distribution of teaching resources across all senior secondary schools in Anambra state. Educational policymakers should ensure that schools, regardless of their location or socioeconomic status, have access to adequate resources for data processing education. This will help reduce educational disparities and promote a more inclusive learning environment. The study highlights the importance of ongoing research, evaluation, and feedback mechanisms to monitor the effectiveness of teaching resource utilization. Schools and educational authorities should regularly assess the impact of these resources on student learning outcomes and make necessary adjustments and improvements to optimize their use. The study suggests that the utilization of teaching resources can enhance student engagement and promote active learning in data processing education. Educators should strive to incorporate interactive and hands-on activities, facilitated by relevant teaching resources, to foster critical thinking, problem-solving skills, and creativity among respondents. By considering these educational implications, policymakers, school administrators, and teachers can work collaboratively to maximize the utilization of teaching resources for efficient data processing learning and instruction in senior secondary schools in Anambra state, ultimately leading to improved educational outcomes and opportunities for respondents.

7. Recommendations

Regarding the findings of this study, the following recommendations were made:

1. Instructors should try as much as possible to use instructional materials in their teaching in data processing.
2. Authorities and government will improvise the access to teaching aids that are not available.
3. Proper orientation should be given to the teachers on the skills necessary for effective utilization of teaching aids to improve instruction.
4. Support devices such as generators and air conditioners and a conducive environment for learning should be provided.
5. Authorities and government should provide funds for practical data processing, thereby improving their technological skills for self-reliance.

8. Limitations

While conducting the study on the utilization of teaching resources for efficient data processing learning and instruction in Anambra state's senior secondary schools, several limitations were encountered. The study was conducted in a specific geographic region and involved a limited number of schools, teachers, and respondents. The findings may not be fully representative of the entire population of senior secondary schools in Anambra state or applicable to other regions or educational contexts. The data collected for this study relied on self-reported responses from teachers and respondents through a questionnaire. Self-reporting introduces the possibility of response bias, where participants may provide socially desirable answers or inaccurately recall information, leading to potential limitations in the accuracy and reliability of the data. The study did not incorporate a control group or comparison group, which limits the ability to make direct comparisons or establish causality between the utilization of teaching resources and student outcomes. The absence of a control group restricts the ability to attribute changes solely to the teaching resources under investigation.

The study was conducted within a specific timeframe, which may have limited the depth and breadth of data collection and analysis. The constraints of time may have prevented the researchers from exploring additional variables or conducting more extensive observations, interviews, or focus groups. The study did not account for potential external factors that may influence the utilization of teaching resources, such as socioeconomic conditions, parental involvement, or school policies. These external factors could have an impact on the effectiveness of teaching resource utilization and should be considered in future studies. The study primarily relied on a survey method to collect data, which may have limitations in capturing the full range of experiences and perspectives related to teaching resource utilization. The use of additional research methods, such as interviews or classroom observations, could have provided a more comprehensive understanding of the topic. Despite these limitations, the study contributes valuable insights into the utilization of teaching resources for data processing learning and instruction in Anambra state's senior secondary schools. Future research should aim to address these limitations by incorporating larger and more diverse samples, employing multiple research methods, considering external factors, and incorporating control groups to strengthen the validity and generalizability of the findings.

Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

References

1. Rice MF, Ortiz KR. Evaluating digital instructional materials for K-12 online and blended learning. *TechTrends.* (2021) 65:977–92. doi: 10.1007/s11528-021-00671-z
2. Dahiru AS, Islam KA, Almustapha J, Aji AA. Teachers' perception on the level of availability of instructional materials in public secondary schools of Zamfara state, Nigeria. *Millenn Univ J.* (2021) 6:11–7. doi: 10.58908/tmuj.v6i1.38
3. Azonuche JE. Revitalizing home economics education in tertiary institutions in Nigeria through ICT use for skill acquisition for global relevance. *J Educ Soc Res.* (2020) 10:332–40. doi: 10.36941/jesr-2020-0131
4. Darmayanti R, Nguyen PT, Serpe A. Gema cow-pu: development of mathematical crossword puzzle learning media on geometry material on middle school students' critical thinking ability. *Assyfa Learn J.* (2023) 1:37–48.
5. Veer V, Phelps C, Moro C. Incorporating mixed reality for knowledge retention in physiology, anatomy, pathology, and pharmacology interdisciplinary education: a randomized controlled trial. *Med Sci Educ.* (2022) 32:1579–86. doi: 10.1007/s40670-022-01635-5
6. Anerua FA, Azonuche JD. Information and communication technology (ICT): a necessary tool for food and nutrition education issues and challenges. *Multidiscipl J Res Dev.* (2010) 14:4.
7. Azonuche JE. Availability and utilization of ICT in clothing and textiles education for effective technical vocational education and training (TVET) and national development. *J Assoc Voc Techn Educ Nigeria.* (2015) 20:8–19.
8. Usman YD, Madudili GC. Assessment of the impact of computer assisted instruction on teaching and learning in Nigeria: a theoretical viewpoint. *Int J Educ Dev Inf Commun Technol.* (2020) 16:259–71.
9. Sharma GS, Subedi BR, Pandey TR. A comprehensive study on online teaching–learning (OTL) system and platforms. *BOHR Int J Comput Sci.* (2022) 1:110–23.
10. Azonuche JE. Computer–aided instruction needs for clothing and textile students in Nigeria's Tertiary Institutions. *Innovations.* (2023) 72:89–97.
11. Meredith TR, Wynn GA, Evans PA. An analysis of the effect of data processing methods on magnetic propeller models in short GRBs. *Monthly Notices R Astron Soc.* (2023) 519:418–31. doi: 10.1093/mnras/stac3511
12. Alciso RM, Boo AA, Julongbayan PE, Ramos QG, Aclan BL, Porley RN. Development of outcomes-based instructional materials in professional teacher education courses for a flexible set-up. *J Educ e-Learn Res.* (2023) 10:61–7. doi: 10.20448/jeelr.v10i1.4378
13. Jakwa AG. Appraisal of the utilization of computer based instructional materials and strategies for teaching computer studies in colleges of education in Northeast, Nigeria. *Int J Innov Inf Syst Technol Res.* (2021) 9:112–9.
14. Adams SO, Onwadi RU. An empirical comparison of computer-assisted instruction and field trip instructional methods on teaching of basic science and technology curriculum in Nigeria. *Int J Soc Sci Educ Stud.* (2020) 7:22–35.
15. Ademiluyi LF. Adequacy and utilization of ICT resources for teaching business subjects in senior secondary schools in Osun state, Nigeria. *Afr J Teach Educ.* (2019) 8:139–58. doi: 10.21083/ajote.v8i0.4899