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The effectiveness of instructional materials in 21st century classrooms and learners' academic outcome

Divine Abua Abua *

Department of curriculum and Evaluation Faculty of Education, University of Yaoundé 1, Cameroon.

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Abstract

The global quest for quality education and the promotion of 21st century skills learners (UNESCO, 2002) has necessitated educational stakeholders to introduce teaching aids that would stimulate students' apprehension for eventual outcome that satisfies educational goals. Many teachers in Cameroon still depend on conventional teaching methods at the expense of modern instructional tools intended to increase learners' engagement. This paper therefore sets to assess the effectiveness of instructional materials in the classroom and how it contributes significantly to learners' academic outcome. This took us to critically review literature on the concept of instructional materials in the teaching-learning process. The theory of experimental learning was used to demonstrate how such materials leads to increase learners' reflection and creativity. It employs a pure quantitative approach and made use of the correlation research design. The sample size considered for this study was 92 students selected from two secondary schools in the Yaoundé II sub Division of Mfoundi Division, Centre region of Cameroon. The data was presented on tables and analysed using the Pearson correlation coefficient. The results shows a significant value 0.76 with a percentage score of 71.6. The findings reveal that most schools do not have adequate instructional tools to support learning and that teachers still face difficulty in effectively using instructional tools for an interactive classroom. We therefore suggested that (1) teachers should be trained on the effective usage of modern instructional materials to influence student learning outcome and governments and (2) schools should provide funds for the acquisition of instructional tools.

Keywords: Instructional materials; Effectiveness; Academic outcome

1. Introduction

Education is widely recognized as a fundamental human right and a powerful tool for promoting economic growth, social development, and individual empowerment (UNESCO, 2020). In other to meet global standard, countries have tend to promote the usage of instructional materials in the teaching-learning process. Their effectiveness lies in their ability to enhance engagement, support differentiated instruction, and develop critical 21st-century skills such as communication, creativity, and digital literacy. Evaluating and utilizing appropriate instructional materials is essential for fostering meaningful learning and academic success in today's rapidly changing educational landscape.

2. Context and justification

Section 37(1) of Law N° 98/004 of 14th April 1998 to lay down guidelines of education in Cameroon states 'The teacher is the main guarantor of quality education' meaning teachers are the main change. This entails that educational institutions need to select, recruit and train competent teachers for meaningful development and achievement of learning outcome (Sudarman et al., 2021). One important dimension in teacher education that is getting a lot of attention to policy makers is the effective use of instructional materials (audio-visual and visual aids) in classroom practices

* Corresponding author: Divine Abua Abua

(Chemwie, 2015). The researcher is of the opinion that the availability of instructional materials in itself is not ends but means to an end. Therefore the effective use of these tools by teachers and the acquaintance of learners to these tools remains the only possibility for a satisfactory educational outcome.

Instructional materials in 21st-century classrooms play a pivotal role in shaping learners' academic outcomes. With rapid technological advancements and shifting educational paradigms, instructional materials have evolved beyond traditional textbooks and chalkboards to include digital tools, multimedia content, and interactive learning environments. Modern instructional materials, such as digital textbooks and adaptive learning platforms, allow for personalized learning experiences. These tools adjust content delivery based on each student's learning pace and preferences, fostering better engagement and comprehension. Research indicates that technology-enhanced instructional materials can deepen understanding, increase retention, and improve critical thinking skills. Students are often more engaged, leading to improved test scores and overall academic performance. Equally, instructional materials like videos, images, charts and other digital simulations increase classroom interactions leading to better learning outcome. When these materials are thoughtfully integrated into the learning process, they foster deeper understanding, improve student outcomes, and create a more inclusive and interactive educational experience.

The Cameroonian government, through the Ministry of Basic Education and the Ministry of Secondary Education, has been working on reforms to improve access to quality education and instructional materials which constitute part of this initiative. Public-Private Partnerships have also been encouraged to provide schools with modern instructional materials, especially through donor funding, NGOs, and international organizations. Other effort are being made at the level of teacher training institutions like the Higher Teacher Training College (HTTC) which emphasize the importance of using instructional materials during teacher education programs.

2.1. Statement of the problem

Empirical findings and observation across secondary schools in different regions of Cameroon have demonstrated that, teachers hardly innovate their teaching methods and less consideration shown in the usage of instructional tools during the teaching-learning activities. This situation has led to low grade point average (GPA) in classroom and certificate examinations, high rate of failure in competitive entrance examinations and increases in school dropouts in schools across the different regions of Cameroon. This is contrary to what educational stakeholders in the country expect. This paper demonstrates the effectiveness of instructional materials in learners' academic outcome.

2.2. Research question

What is the significant relationship between the effectiveness of instructional materials and learners' academic outcome in 21st century classrooms?

2.3. Research objective

To investigate the significant relationship between the effectiveness of instructional materials and learners' academic outcome in 21st century classrooms.

2.4. Research hypothesis (Ha)

The effectiveness of instructional materials has a significant relationship with learners' academic outcome in 21st century classrooms.

3. Literature review

The term instructional material has been defined by Usman and Adewumi (2006), as all the equipment and materials used in the teaching-learning process in order to stimulate students act objectively and contribute in the lesson. They are locally made or imported tools that assist the teaching-learning process and which could make tremendous enhancement of intellectual understanding (Obanga, 2005 and Abdullahhi, 2010) as cited in Igiri & Effiong (2015). Inyang-Abia (1994) sees instructional materials as devises that could be employed to ease the teaching-learning process and include radio sets, televisions, film trips, projectors, computers amongst others. Orji (2000) termed it as teaching aids which guides learning activities in the classroom. The instructor uses such tools to motivate and arouse students' desire to learn.

Earthman (2002) and Alice (1956) opine that instructional materials must be diverse to bring out the targeted values in the learners at each level. Using one text book for instance would not permit learners to do enough research to ask questions, simply because what they have is unique. This reduces the spirit of creativity and reflection in learners.

Effective learning takes place where the teacher makes proper use of the instructional resources as well as orientates learners while using teaching methods that attract attention such as demonstration, experimental or discussion methods (Raw, 2006). He further stipulates that to enhance effective teaching, students should be allowed to practically manipulate the provided materials themselves and make findings for necessary conclusions to be drawn.

The presence of instructional materials and other school facilities would likely motivate students towards learning and could help enhance effective teaching and learning processes through the interaction of the learner within the teaching environment and improving the quality of teaching (Olanrewaju, 2016 cited in Olanrewaju et al., 2020). The use of these materials brings life into the learning process, and stimulates students to better engage in skills acquisition. Again the use of instructional tools in the classroom can influence teacher to develop new approaches in explaining concepts with clarity resulting to a greater retention and understanding of these concepts by the learners (kochhar,1991).

According to Romiszowski (1988; Walking,1982 and Hills,1982 cited in Chemwei,2015), when instructional materials are properly selected and used in lessons, the learning process becomes more interesting and meaningful, also the knowledge gained in the process would last longer in the memory of learner. Likewise, the students would be actively involved in lessons. With the use of instructional materials, learners gain practical experiences that could assist them to develop skills and concepts as well as various techniques of doing work. This is because in the teaching and learning activities, more of the learner's sense is stimulated through audio-visual materials (Sampath, 1990). So, teachers who do their best in using instructional materials in the classroom will develop the potentials of explaining new concepts very clearly, leading to increase understanding of matter taught to students (Chemwei, 2015). According to Dhakal (2020) the essential materials for teaching is often unavailable in most community schools. This leads teachers to talk and chalk in the teaching and learning process.

Table 1 Category of instructional materials/resources

Category	**Description**	**Examples**
Traditional materials	Physical material usually in printed forms or handmade	(Textbooks, workbooks Chalkboards, printed handouts)
Digital materials	Software applications, platforms used to facilitate tasks	(E-books, online resources and multimedia)
Interactive materials	Educational resources that encourage active and engagement	(games, simulations, handson activities)
Audio visual materials	A combination of sound and visual elements participation to convey information	(Audio recordings, podcasts)
Visual materials	visible information which can be read with eyes	Images like photographs (Videos, Infographics and diagrams.)

(Source: Researchers' perspective, 2025)

3.1. Experimental Learning Theory (David Kolb, 1984)

David Kolb (1984) used the 'Experiential Learning' to explain how the participants experiences for acquisition of knowledge is relevant than just waiting for the instructor to give and direct lessons. To him, classroom teachers should adequately acquire and use modern visual or audio-visual instructional materials to stimulate learners. Hence, those with visual intelligence tend to learn most readily from visual presentations such as movies, pictures, and video demonstrations. Since these tools spur discussion, students will do what they already know and complete the end of the end of the lesson. He insists that through gaming, students can systematically make decisions and anaylse situations. The learners commence with an experience, which conveys them to observe and reflect on their experiences and later create abstract concepts on what occurred (Baker, Jensen, & Kolb, 2002 cited in Zhou and Brown, 2015). Ulrich (1997) goes further and supports that games are vital to simulate learning as learners actively make reflective observations and abstract conceptualization.

4. Methodology

This study employed the correlational research design. The clustered sampling technique was used to choose the participants of the study, out of which, a sample size of 92 students was chosen. Table 2 below describes the characteristics of the population under study.

Table 2 Population of the study

Variable	Modality	Frequency	Percentage
AGE	8-10years	13	14.1%
	10-14years	13	14.1%
	14-16 years	8	8.7%
	17years and above	18	19.6%
GENDER	Male	37	40.2%
	Female	55	59.8%
STATUS	Handicap	11	12.0%
	Non handicap	81	88.0%

(Source: field data, 2025

Figure--describes the demographic characteristics of the population of study according age, gender and status. The number of students between the ages 8-10 was 13 making a percentage of 14.1%; those between10-14years were 13 and represented 14.1%, between 14-16 years students were 8 in number and represented 8.7% while those above 17yrs 18 making a percentage of 19.6%. Concerning gender, females out number males with a percentage of 59.8% (37) against 40.2% (55). Meanwhile, there were 11 Handicap students at 12.0% and non-handicap of up to 81 out of the sample size making 88.0%.

4.1. Data presentation and analysis

The data was coded, followed with a thorough check to ensure there were no mistakes in the coding. It was then computed, converted using the Statistical Package for Social Sciences (SPSS the independent variable was analysed using descriptive statistics with the mean and standard deviation. Meanwhile, the dependent variable was analysed using the Pearson correlation coefficient. The data was presented on tables.

4.2. Descriptive statistics

This describes the spatial distribution of variables from the observed mean. The statements according to different respondents have therefore been presented on frequency tables after calculating mean and standard deviation as seen below.

Table 3 The effective usage of instructional materials

Statements	N	Mean	Std. Dev
Teachers go to class with prepared lessons and textbooks	92	2.00	148
Lessons are demonstrated with the use of charts, maps and images	92	3.17	0.750
Teachers play audio records for you to understand the lesson	92	2.63	024
Video projectors are used to present lessons in class	92	1.97	999
Teachers dictate notes without using the blackboard on the board.	92	1.96	1.015
Every student in class does workbook exercises.	92	2.11	0.053
Students use internet to do homework	92	2.48	1.084
Students visit science laboratory and computer rooms.	92	2.8	1.004
Students manipulate computers during lessons	92	2.68	1.058
Many students in your class have textbooks.	92	2.36	1.075
Listwise	92		

(Source: Field data, 2025)

Table 3 describes respondents view on the effectiveness of instructional materials. In the first item, respondents agreed (Mean=2.00; SD=148) that Teachers go to class with prepared lessons and textbooks. The second item showed that respondents agreed (Mean=3.17; SD =0.750) with the statement, Lessons are demonstrated with the use of charts, maps and images. In the third item, respondents agreed (M= 2.63; SD=0.024) with the statement that Teachers play audio records for you to understand the lesson. In the fourth item, respondents equally agreed (M= 1.97; SD=0 .999) that Video projectors are used to present lessons in class. The fifth item showed that respondents agreed (M=1.96; SD=1.015) on the view that teachers dictate notes without using the blackboard. In the sixth item, respondents agreed (M=2.11; SD=1.053) with the view that every student in class does workbook exercises. In the seventh item, respondents agreed (M=2.48; SD=1.084) that they use internet to do homework. The eighth item shows that respondents agreed (M=2.88; SD=1.004) with the opinion that students actually visit science and computer laboratories. In the ninth item, respondents further accepted (M=2.68; SD=1.058) that teachers allow students manipulate computers during lessons. Finally, respondents shared a positive view (M=2.36; SD=1.075) on the statement that many students in class have textbooks. The findings show that each unit of measurement has a cut off mean above 2.5 which is the average mean of the scale. This signifies that the respondents' generally agreed that the effectiveness of instructional materials contributes to learners' academic outcome in 21st century classroom.

4.3. Pearson correlation coefficient

This was used to show the relationship between instructional materials and learners academic outcome. This is show on the table below.

Table 4 The relationship between instructional materials and student learning outcome

Variables		**Instructional materials**	**Learning outcome**
Instructional Materials	Pearson Correlation	1	0.716**
	Sig. (2-tailed)		0.000
	N	92	92
Learning Outcome	Pearson Correlation	0.716**	1
	Sig. (2-tailed)	0.000	
	N	92	92

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4 above shows the Pearson's correlation value (r) is 0.716. The results highlighted that PV 0.00 is less than 0.005 which is the alpha and standard error margin. The correlation coefficient is 71.6% which signifies that the effectiveness of instructional materials has an influence on learners' academic outcome at 71.6%. In this way, Pearson correlation coefficient indicated that any amelioration in the unit of measurement in instructional materials lead to a corresponding increase in learning outcome. Therefore, school administrators should ensure the provision and teachers usage of instructional tools as a means of increasing learning outcome in schools in Cameroon.

5. Discussion of findings

The objective of this paper was to find out the significant relationship between the effectiveness of instructional materials and learning outcome in 21st century classrooms. The results showed 71.6 significance at 0.71 coefficient value. This results which is greater than 0.5 (alpha and standard error margin). This signifies that each time that teachers use instructional materials in class, learners' academic outcome increases. We found that through the use of instructional materials, teachers will develop the potentials of explaining new concepts very clearly, leading to increase understanding of matter taught to students. It will equally help them develop new approaches in explaining concepts with clarity resulting to a greater retention and understanding of these concepts by the learners (kochhar, 1991). This colloborates with the theory of experimental learning which states that the usage of instructional materials like games cause learners to commence with an experience, which conveys them to observe and reflect systematically and make decisions (Baker, Jensen, & Kolb, 2002 cited in Zhou and Brown, 2015). Despite the importance highlighted, we also found that the essential materials for teaching are often unavailable in most community schools (Dhakal, 2020) and teachers have sorted to talk and chalk in the teaching and learning process.

Recommendations

- Government and schools should make available funds for the acquisition of instructional tools and also ensure the equitable distribution of such resources to rural and urban areas.
- Schools should endeavor to integrate technological based instructional materials to engage students more effectively.
- Classroom teachers should be trained on the effective usage of modern instructional materials to influence student learning outcome

6. Conclusion

To conclude, the fast development of technology has not left out the educational sector. Recent innovations in the world of technology and its increasing demand by educational stakeholders found students and teachers warranted. Considering its impact on learners' academic outcome, we suggest that its role should not be neglected in any sense.

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