

Resource Needs and Effective Implementation of 21ST Century Teaching Methodologies in Nigerian Education System: Stakeholders' Participation

ALAO Adreonke Olubukola Ph.D

Curriculum and Instruction Department

Sikiru Adetona College of Education, Omu-Ajose, Ogun State.

ronkealao303@gmail.com

alaoao@sacoetec.edu.ng

ADENUGA Mariam Oladunni

Curriculum and Instruction Department

Sikiru Adetona College of Education, Omu-Ajose, Ogun State.

Adenugamariam04@gmail.com

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Abstract

Effective implementation of 21st century methodologies in schools still seems below expectation thus, this study examined the participation and support of stakeholders in this regard. Two research questions were raised and one hypothesis tested at 0.05 level of significance. The study adopted the survey research design with a population that consisted of all secondary schools in Ijebu-Ode Local Government area. 4 public and 4 private schools were randomly selected with participants comprising 150 teachers. The instrument used for the study was titled Stakeholders' Participation for Implementing Modern Instruction (SPIMI). Means and Standard Deviation were used to analyse the two research questions and it was deduced that stakeholders provision of projectors and interactive display equipment for classroom instruction and Assistance in equipping libraries and digital learning resource were high ($\bar{X}$ =2.89) and ($\bar{X}$ =2.76) respectively. However, construction of modern classrooms and teachers training had low means of ($\bar{X}$ =2.1) ($\bar{X}$ =1.70) respectively. A non significant mean difference between male and female teachers' responses was found ($t=1.74$, $p>0.05$). The result revealed that the mean of male teachers' perception on the availability of modern teaching equipment ($\bar{X}$ = 2.60 $SD=.062$) was not significantly higher than the female counterparts ($\bar{X}$ = 2.53, $SD=.026$). Thus it was recommended that there should be a deeper collaboration among Government, Proprietors and Stakeholders in areas of provision modern fully equipped classrooms and ICT Laboratories. Additionally, provision should be made for better internet service connectivity for better teaching and learning experiences.

Key Words : *Resource Needs, 21ST Century Teaching Methodologies , Education*

Introduction

Education in Nigeria can be traced to the pre-colonial era where indigenous education was used. The child acquired knowledge informally in the home, through religious societies/ceremonies, apprenticeship among others. Since there were no written syllabi, the method of transmission of knowledge was through imitation/modelling methods. During the colonial era rote learning was the popular means the missionaries used in teaching their limited curriculum comprising of majorly of the

3Rs namely Reading, Writing and Rithmetic. However, in this modern interconnected world, stakeholders have repeatedly called for shift in the education paradigms. There should be change from the traditional teacher-centered teaching methods such as lecture, demonstration, story telling pedagogies whose characteristics include teacher as main source of knowledge; passive learning and direct instruction, to student-centered pedagogies. Erwin (2024), emphasised that in this 21st century, transformative shift in education process, necessitating innovative and effective learning methodologies to prepare students for challenges of a rapidly evolving world. Student-centered teaching methodologies are now being prioritized in many developed worlds in order to promote skills such as critical thinking, collaboration, communication and creativity among learners. The skills remain useful in daily life activities, workplace and the development of the society.

Despite importance of 21st century teaching skills, several Nigerian schools continue to encounter significant resource constraints. Majority of government owned schools still lack functional computer laboratories and interactive technologies, reliable internet connectivity and teachers have limited opportunities for professional development in requisite technological areas (World Bank, 2022). Persistent underfunding of the education system has been identified by several researchers as the major source the issue mitigating against effective integration of the 21st century skills in teaching and learning. Sadly, several schools continue to depend on conventional teaching methods that focus on rote learning in place of critical thinking, problem solving and creativity which are essential for producing modern workforce who contribute significant national development(OECD, 2019). It is against this backdrop that this paper highlights the characteristics of 21st century methodologies, types, benefits, resource needs and stakeholders' contributions to 21st century methodologies implementation in schools.

Statement of the Problem

Incorporation of 21st century methodologies in the teaching process is imperative for better performance and also necessary to be abreast with current trends for the attainment global standards. However, schools particularly at the secondary level seem not adequately prepared for this task. Scholars have pointed out poor internet connectivity, Inadequate technological equipment, and teacher training amongst other issues as constraints to effective implementation. Many studies have focused on the roles of Government and school owners in providing various financial, human and material requirements in this regard but only few have researched on the participation of stakeholders in

complementing Government efforts in provision of needed resources particularly in Ijebu- Ode Local Government Area in recent times.

Objectives

The main purpose of this study is to examine resource needs and effective implementation of 21ST century teaching methodologies in Nigerian education system focusing on stakeholders' participation in Ijebu-Ode Local Government Area in Ogun State. Specifically, the study sought to:

1. Determine the extent of availability of technological equipment in selected schools in Ijebu -Ode Local Government Area;
2. Ascertain the extent of participation of stakeholders in the provision of technological resources in selected schools in Ijebu-OdeLocal Government Area and
3. Examine if teacher's perception of availability of technological equipment in secondary schools in Ijebu-Ode Local Government Area will differ based on gender.

Research Questions

The following research questions were raised to guide the Study.

1. What is the extent of availability technological equipment in selected schools in Ijebu -Ode Local Government Area?
2. What is the extent of participation of stakeholders in the provision of technological resources in selected schools in Ijebu-OdeLocal Government Area?

Research Hypothesis

Ho₁ : There is no significant difference between male and female teachers' perception of the availability of technological equipment in secondary schools in Ijebu-Ode Local Government Area.

Theoretical framework

Resource Dependency Theory (RDT)

The theory was developed by Pfeffer and Salancik (1978), its basic assumption is that organizations rely on external resources such as funding, information, materials and support to function effectively. Hence,

educational institutions depend on government funding, donor agencies, private organizations and other stakeholders but when the resources are inadequate or unstable, schools struggle to provide digital technologies, teacher training, internet connectivity and other modern materials needed for 21st century teaching. When applied to Nigerian education system, inadequate funding limits provision of ICT facilities, reduces opportunities available for staff professional development, affects maintenance of digital infrastructure then consequently, schools become unable to effectively implement learner-centered 21st Century methods.

Characteristics of 21st Century Education

Romani (2013), highlight six features of 21st century education which are discussed below:

- i. Technology : It very essential for teaching and learning in the classroom, also enhances collaborations and sharing ideas. However, face to face and social skills are often lost these days because technology but still imperative in our day to day lives to make friends, do business and smooth running of organizations.
- ii. Hands-on learning: Students learn more by doing things ourselves rather than just watching and listening.
- iii. Collaboration: Despite our best efforts we may not know all that is needed. It is far easy to work together to achieve common goals. This helps to recognize strengths in other people.
- iv. Student Centered Learning: This seems challenging to implement mainly because the curriculum of most schools is focused around learning facts. Incidentally, education in the class does not permit learning due to all the activities that occur in the classroom. Teachers are mainly focused on moving from one topic to another. Learning is then based on memorizing and recalling names, dates, formulas and events. Teachers are sources of information while students are passive entities in the classroom. The idea of student centered learning is about hands on and active learning. Students should be given opportunities to apply ideas they are being taught in the classroom.
- v. Creativity: Not about replicating ideas of other people but coming up with new ideas. Students need to be encouraged to come up with new ideas, innovation that can boost the economy. New ideas should be encouraged, even if students fail they should be encouraged that it is an opportunity to learn. New ideas often do not come from following things the way it has been done before but emanates from taking risks and

trying to do things in a different way. Ayodele (2025), stated that creativity is about getting deep thinking to face a challenge and get to the root of it using information that is self-generated and making new connections which that will lead to coming up with innovative solutions.

- vi. Entrepreneurship: It is the combination of all the five skills mentioned above, involving applying education to real life situations, creativity, technology, taking risks etc.

21st century teaching methodologies

Innovative teaching put students at the center of strategies

1. Flipped classrooms: Students explore new materials at home and apply knowledge actively in class. This method reverses the traditional learning structure by introducing students to new contents outside the classroom through pre –recorded lectures or readings. Then during the class period there are discussions, collaborative activities and problem solving. The teacher is a facilitator in this scenario, offering guidance and answering questions in areas students find confusing. Erwin (2024), noted that the approach empowers students to take ownership of their learning by learning at their own pace at home and allows educators to provide personalized support.

Other benefits include

2. Project- based learning: involves hands –on projects build skills and encourage critical thinking. Learners are expected to delve into real world problems by engaging in hands on project, applying theoretical knowledge to practical situations, promoting deeper understanding of situations and concepts.
3. Inquiry –Based learning: This involves learners asking questions, exploring topics and discovering answers through research and critical analysis. It stimulates curiosity and develop research and analytical skills.
4. Collaborative Learning: This emphasizes group activities, discussions and projects when the learners work together in groups to achieve common goals. The learners develop social skills through building relationships with each other and also being exposed diverse perspectives.
5. Blended Learning: It integrates traditional and technological teaching methods which can cater for diverse learning styles. This approach enables the combination of personal learning with on-line resources. Google classroom is among the most used for this purpose.

6. Gamification: In this situation, game elements are incorporated into the learning process. It leverages on making learning enjoyable and promoting healthy competition. Educators have discovered that using same principles and elements that games experts use to capture the attention of children can be deployed for learning.
7. Differentiated Instruction: Instructions cater to unique learning styles, readiness and interests of each learner. This strategy involves using variety of different instructional methods to teach students the same topic. It would also require the teacher to teach the same content using different methods to meet the learning needs of individuals student.

Resource Needs for effective Implementation of 21st century teaching skills in Nigerian Education System.

1. Financial Resources: There is need for adequate government funding, grants and public-private partnerships. Furthermore, funds should be earmarked for maintainace and upgrading of technological infrastructure.
2. Human Resources: Qualified and competent teachers, ICT instructors and technical support staff are sin qua non for vibrant technological driven educational systems. Teachers are undoubtedly the most important factor for achieving profitable outcome learning outcome in every school system. The future of any nation, to a large extent is contingent upon the quality of its teachers. Therefore, adequate provisions should be made for continuous professional development of teachers to keep them abreast of emerging trends.
3. ICT Resources: There are variety of equipment required for imparting 21st century skills in students ranging from desktop and laptop computers, tablets and smart phones, interactive boards, multimedia projectors, printers and scanner, Reliable internet connectivity (broadband/ Wi-Fi) and educational software and learning management system.
4. Physical Infrastructure: This refers to buildings such as well-equipped classrooms, computer laboratories, digital libraries and reliable electricity supply and backup power such as solar systems or generators.
5. Instructional resources: It connotes digital /e-books, multimedia teaching materials, audio-visual learning materials, educational videos and online learning platforms.

6. Curriculum resources: The available curriculum must align with 21st century competences with matching teacher guides and instructional manuals coupled with assessment tools useful to evaluate critical thinking, creativity, collaboration and communication skills. Adelakun-Adeyemo (2021) empirical findings revealed that Nigerian education policy and curriculum falls short of global and regional standards of provisions in response to the needs of 21st century workforce therefore there is an urgent need for revision of current curriculum to make explicit recognition and provisions for teaching and learning 21st century skills in schools.

7. Professional Development resources: training of personnel is required to be done regularly through workshops and seminars, ICT certification programmes, online training, peer mentoring and coaching including participation in professional learning communities activities. Additionally, Ajadi(2024), asserted that educational institutions should develop online platforms or networks where teachers can collaborate, share resources and discuss successful strategies for implementing 21st century pedagogies, institutions should facilitate a community of practice to foster continuous learning among educators.

8. Policy and Administrative support: Government agencies and institutions are to ensure there are explicit ICT educational policies and practicable implementation plans. Furthermore supervisory, monitoring and evaluation frameworks should be put in place.

9. Partnership with Organisations and communities: Partnerships with technology companies, collaboration with research institutions, Non governmental organizations. Parent Teacher Associations, Alumni and community support will augment government and institutional efforts in promoting technological driven educational system. Specifically, Ajadi (2024), stated community should set resource centres equipped with educational materials internet access and technology tools for students within the community.

Methodology

The study adopted the survey research design with a population that consisted of all secondary schools in Ijebu-Ode Local Government area. 4 public and 4 private schools were randomly selected with participants that comprise teachers to give 150 respondents. The instrument used for the study was titled Stakeholders' Participation For Implementing Modern Instruction (SPIMI). The instrument has three sections (A, B and C). Section A elicited demographic information from the respondents, while section B and C prompted items on research questions one and two. The items of the instrument elicited responses on a 4-point Likert scale of Very High Extent (VHE), High Extent (HE), Low Extent (LE),

and Very. The reliability coefficient of $r=0.75$ was established after trial test using Cronbach alpha. The hypothesis was tested using independent t-test at $p<0.05$ level of significance.

Results and Discussion

Research Question 1: What is the extent of availability technological equipment in selected schools in Ijebu -Ode Local Government Area?

Table 1: Availability of Technological Equipment in Schools

S/N	Technological Equipment	Mean	Standard Deviation	Remark
1	Computers and Laptops	2.64	2.29	High extent
2	Interactive Smartboards	1.77	1.51	Low extent
3	Tablets (eg. iPads, Android tablets)	2.61	2.25	High extent
4	Projectors and digital displays	2.74	2.47	High extent
5	Internet and Wi-fi Connectivity	1.83	1.54	Low extent
6	Learning Management Systems	2.55	2.32	High extent
7	Document Cameras (Visualizers)	1.98	1.76	Low extent
8	Audio Equipment (eg. Speakers, microphones and headsets)	2.85	2.55	High extent
9	Video conferencing tools	1.86	1.64	Low extent
10	Printers	3.40	2.98	Very high
11	Educational Software and Applications	2.66	2.44	High extent

Decision Rule: 1.00– 1.74 = Very Low Extent (VLE), 1.75 – 2.49 = Low Extent (LE), 2.50 –3.24 = high Extent (HE), 3.25 – 4.00 =Very High Extent (HE)

Table 1 shows the teachers' responses on availability of technological equipment in Ijebu-Ode Local Government Area. The results revealed the high availability of technological, equipment such as computers and laptops($\bar{X}$ =2.64), Educational software and Apps($\bar{X}$ =2.66), projectors and digital displays ($\bar{X}$ =2.74) and Audio Equipment ($\bar{X}$ =2.85) however, printers was most available with the highest mean of ($\bar{X}$ =3.40). On the other hand Interactive Boards and Internet connectivity were found to be least available with low mean values of ($\bar{X}$ =1.77) and ($\bar{X}$ =1.83) respectively.

Research Question 2:What is the extent of participation of stakeholders in the provision of technological resources in selected schools in Ijebu-Ode Local Government Area,?

Table 2: Stakeholders provision of technological resources to aid modern Teaching Methodologies.

S/N	Items	mean	Standard Deviation	Remark
12	Construction of modern classrooms suitable for 21 st century teaching and learning activities.	2.26	2.10	Low extent
13	Provision of functional ICT laboratories for teaching and learning.	2.04	1.80	Low extent
14	Provision of furniture that supports collaborative and learner-centerd teaching.	2.62	2.40	High extent
15	Provision of projectors and interactive display equipment for classroom instruction.	2.89	2.54	High extent

16	provision of computers, laptops and visualizers.	2.61	2.38	High extent
17	Provision of reliable internet connectivity to support technology-based teaching.	1.81	1.47	Low extent
18	Assist in equipping libraries and digital learning resources to support modern teaching methods.	2.76	2.50	High extent
19	Embark on regular upgrade of existing infrastructure.	2.92	2.64	High extent
20	Monitor projects and renovate teaching and learning infrastructure.	2.74	2.49	High extent
21	Sponsor teachers to improve their technological skill to enhance effective implementation of 21 st century skills	1.97	1.70	Low extent

Decision Rule: 1.00– 1.74 = Very Low Extent (VLE), 1.75 – 2.49 = Low Extent (LE), 2.50 –3.24 = high Extent (HE), 3.25 – 4.00 = High Extent (HE)

Table 2, depict responses of teachers based on the supports from various stakeholders on the extent of provision of technological resources for modern teaching in Ijebu-Ode Local Government Area. Analysis of the items in the table above showed that stakeholders provision of projectors and interactive display equipment for classroom instruction and Assisting in equipping libraries and digital learning resources to support modern teaching methods of participation are ($\bar{X}$ =2.89) and ($\bar{X}$ =2.76) respectively. This is followed by item 20, Monitor projects and renovate teaching and learning infrastructure ($\bar{X}$ = 2.74). On the other hand, Items 12 and 13 which pertains to construction of modern classrooms and provision of ICT laboratories were seen to have low means ($\bar{X}$ =2.1) and ($\bar{X}$ = 1.80). Other items on training of teachers and provision of reliable internet connectivity also recorded low means.

Research Hypothesis:Ho₁ : There is no significant difference between male and female teachers' perception to the availability of technological equipment in secondary schools in Ijebu-Ode Local Government Area.

Table3: Difference between male and female teachers' perception on the availability of technological equipment

Variables	N	Mean	Std Deviation	Df	T	Sig	P	Remark
Males	74	2.60	0.62	148	1.74	0.06	0.05	significant
Female	76	2.53	0.26					

Table 3 shows difference between male and female teachers' perception on availability of technological equipment in Ijebu-Ode Local Government Area. A non significant mean difference between male and female teachers' responses was found ($t=1.74$, $p>0.05$). The result revealed that the mean of male teachers' perception on the availability of modern teaching equipment ($\bar{X} = 2.60$ $SD=.062$) was not significantly higher than the female counterparts ($\bar{X} = 2.53$, $SD=.026$). Therefore the null hypothesis was accepted.

Discussion of Findings

Table 1 depicts the teachers' responses on availability of technological equipment in Ijebu-Ode Local Government Area. The results revealed the high availability of technological equipment such as computers and laptops, Educational software and Applications, projectors and digital displays, and Audio Equipment. Whereas Interactive Boards and Internet connectivity were found to be least available with low mean values of ($\bar{X}=1.77$) and ($\bar{X}=1.83$) respectively. These findings corroborate the findings of Isah & Amoo (2019) which states that technological equipment for teaching and learning are insufficient for secondary school students in Ibadan metropolis. Partly in agreement with this study, Okechukwu and Ogbonaya-Ngwu (2023), in their study in public and private schools in Abia State found out that the smart phones and computers were most adopted technological devices by teachers indicating (31.1%) and (25.3%) respectively but the least was educational Apps representing (3.6%). Table 2, depict responses of teachers based on the supports from various stakeholders on the extent of provision of technological resources for modern teaching. Analysis of the items in showed that stakeholders provision projectors and interactive display equipment for classroom instruction and Assist in equipping libraries and digital learning resources to support modern teaching methods of

participation of ($\bar{X}=2.89$) and ($\bar{X}=2.76$) respectively. This is followed by item 20, Monitor projects and renovate teaching and learning infrastructure ($\bar{X}=2.74$). On the other hand, Items 12 and 13 which pertains to construction of modern classrooms and provision of ICT laboratories were seen to have low means. These findings partly corroborates Wabara & Agala(2023) who found that stakeholders contribute in provision of physical facilities for educational development of public senior secondary schools in Rivers State to a moderate extent. Generally it can be observed that contribution of stakeholders in the provision of technological equipment is still low. Table 3, shows difference between male and female teachers' perception on availability of technological equipment. A non significant mean difference between male and female teachers' responses was found ($t=1.74, p>0.05$). The result revealed that the mean of male teachers' perception on the availability of modern teaching equipment. Therefore, from the result of the analysis, the null hypothesis is accepted. This result corroborates the findings of Wordu et al., (2021) which states that there is no significant difference in the means of male and female teachers on the extent to which technological tools are available for instructional delivery in secondary schools in Port Harcourt metropolis.

Conclusion

21ST Century pedagogies remain indispensable for educators to effectively engage students during teaching and learning process. However, effective implementation of this modern approaches is still affected by inadequate technological resources. Findings above revealed that stakeholders contributions have been high in provision of projectors and interactive display equipment for classroom instruction and equipping libraries and digital learning resources to support modern teaching methods. Additionally, there has been high level of effectiveness in project monitoring and renovation as well as teaching and learning infrastructure. Nevertheless, this study underscores the need for increased infrastructural provision in terms of ICT laboratories, regular training of teachers to increase their proficiency and reliable internet connectivity.

Recommendations

1. Stakeholders and government should invest more in technology infrastructure because many of the 21st century teaching methodologies are dependent internet access. Hence, more financial resources should be channelled towards provision of ICT facilities, modern instructional materials, internet connectivity to aid teaching and learning.

2. Internet service providers to work more on increasing the bandwidth for the country with more attention given to educational sector. This will strengthen the connectivity and ease the frustrations faced by users during the teaching and learning process.
3. Collaboration for funding: There should be collaboration between education institutions, government, business organizations, Alumni and community in providing funds and technological resources useful to train learners in the modern way . This will enhance a public-private partnerships and foster harmonious town and gown relationships. Moreover learners trained with 21st century methodologies are more likely to apply acquired skill in future workplaces.
4. Teacher training and professional development: Stakeholders such as proprietors, philanthropist, business organisations, ministries and educational agencies at all levels of government should regularly organize on- the – job training for all teachers to expose them 21st century pedagogies. Furthermore educational institutions should engage in physical and online platforms where teachers can collaborate, share resources and raise the forum of engaging in new and more impactful methods.
5. Public enlightenment and community resources: Parents, guardians and students should be intimated with benefits inherent in 21st century methodologies. Parents should provide technological devices for learning purposes for their children under strict guidance and government should also set up community resource centres in local government areas to facilitate the use of technological equipment by teacher and students within the community.

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