

Modernization of School Facilities: A Path to Global Education Excellence in Bayelsa State

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DOI: [10.56201/ijee.v10.no1.january2024.pg205.217](https://doi.org/10.56201/ijee.v10.no1.january2024.pg205.217)

Abstract

The paper centers on modernized school facilities in the pursuit of educational excellence in Bayelsa State. It emphasized the need for updated school facilities that will provide conducive and innovative learning environments. As teaching methods evolve, so too the need for modifications in school facilities to accommodate these changes. Current pedagogical models demand more modernized facilities, as exemplified by the shift away from the traditional single-classroom setup. Modernization is identified as a critical strategy to prepare students for success in the global context. Hence it is very pertinent that school facilities are modernized to shape the path to global education excellence in Bayelsa State. Hence, this paper explores modernization in education, school facilities, impact of modernized school facilities, categories of modernized school facilities, smart classrooms, stem labs, digital libraries, flexible learning spaces, virtual learning environments and advanced security systems. It was recommended that educational authorities should provide opportunities for ongoing professional development for teachers, particularly in the effective use of technology and modern teaching methods in modernized facilities among others.

Introduction

In Bayelsa State, as in other parts of Nigeria, the modernization of school facilities is emerging as a crucial pathway toward achieving global educational standards and unlocking vast human potential. The transformation of education transcends the confines of classrooms and curricula. It involves the very facilities that shape the learning environment, influencing students' academic performance, motivation, and overall educational experience (John 2018). In the area where unique challenges, including geographical isolation and resource disparities, often impact educational opportunities, the modernization of school facilities' represents an opportunity for transformation.

Modernization is a multifaceted process involving significant social, economic, cultural, and political transformations aimed at achieving development and progress (Ritzer, 2010). Modernization typically includes the adoption of new technologies, practices, values, and

institutions associated with more advanced or industrialized societies (National Clearinghouse for Educational Facilities 2008). Modernization is frequently connected to increased globalization, with societies becoming more interconnected through trade, communication, and cultural exchange. In the contemporary educational landscape, the importance of modernized school facilities cannot be overstated. These facilities are instrumental in shaping the future of education by fostering an environment where students can thrive academically, socially, and emotionally.

The facilities within a school play a crucial role in the quantity and quality of education provided. It is acknowledged that while teaching and learning are interconnected, students have the capacity to learn even without direct teacher involvement. Akande (2010) posits that learning can occur through a student's interaction with their environment, which encompasses various resources facilitating the learning process. These resources encompass educational tools like books, audio-visual aids, software, hardware, as well as physical elements such as classroom size, availability of furniture, chalkboards, and storage spaces for practical equipment.

Chikafalimani, Kibwami, and Moyo (2021) define facilities as the tangible elements where products or services are generated, stored, and distributed. They are the materials that empower trained and skilled individuals to efficiently and effectively accomplish specific tasks, whether on an individual or organizational level. Nuru (2014) characterizes school facilities as the tools that a proficient teacher utilizes to effectively implement school instructional objectives. In essence, educational facilities encompass the resources that facilitate the teaching and learning process for students in a school setting (Esomonu as cited in Manabete & Makinde, 2016). Manabete and Makinde (2016) affirm that school facilities encompass equipment, tools, instructional materials, consumables, and infrastructure elements such as classrooms, assembly halls, libraries, laboratories, and workshops.

School facilities refer to the physical components, infrastructure, and resources within an educational institution that support the teaching and learning process. These facilities include classrooms, libraries, laboratories, sports fields, playgrounds, administrative offices, technology infrastructure, and various amenities that contribute to the overall educational environment (National Clearinghouse for Educational Facilities 2003). School facilities needs updating and improving the physical facilities and resources within educational institutions to meet contemporary educational needs and standards. This may involve renovating existing buildings, incorporating modern technology, enhancing safety measures, and creating a more conducive learning environment for students and educators (United States Government Accountability Office 2017).

Modernized school facilities provide students with safe, comfortable, and technologically equipped spaces that are conducive to learning. Up-to-date classrooms and resources can significantly enhance the learning experience (National Center for Education Statistics 2019). Outdated facilities can pose safety hazards for students and staff. In the digital age, schools need to have infrastructure that supports technology integration in education. Modern facilities are equipped with high-speed internet, interactive whiteboards, and other tech tools that enhance the learning experience (National Center for Education Statistics 2020).

Modernization in Education

Modernization is commonly perceived as a transformative process, involving the shift from a traditional society to one grounded in science and technology. This process encompasses alterations not only in a nation's material culture but also in its belief systems, values, and overall way of life (Renu 2014). It serves as a means to instigate desired changes in social structure, value orientations, motivation, and norms, essentially transforming a society from a backward framework into a forward-looking and progressive entity. It's crucial to note that modernization doesn't equate to mere imitation of advanced countries; instead, it aids a nation in establishing its unique identity and society. A modernized society is one that effectively harnesses the advancements in the realms of science and technology. It's a process of change that extends to the development of social, economic, and political systems, as well as influencing various aspects of life such as lifestyle, communication, urbanization, literacy, residence, and profession (Avdhesh 2016). The realm of education is profoundly impacted by modernization, as it necessitates the adaptation of educational practices and systems to align with the evolving needs of students and society.

Modernization in education is a dynamic process that involves the adaptation and evolution of educational systems and practices to meet the changing demands of students and society. This entails various facets, including the integration of technology, innovations in the curriculum, and pedagogical approaches that nurture 21st-century skills. It represents a comprehensive approach to reimagining and overhauling the educational landscape to align with the requisites of the digital age, globalization, and the rapid advancements in technology (Bates 2019). Modernization in education signifies a shift in the way education is conceived, delivered, and utilized. It mandates a change in mindset, delivery methods, and learning approaches that empower individuals to analyze, interpret, make informed decisions, and substantiate those decisions (Vasudev 2010). In the context of educational institutions, modernization denotes the process of updating and enhancing physical infrastructure, equipment, and educational resources to meet contemporary standards and the evolving needs of educators and learners (U.S. Department of Education 2016).

Avdhesh (2016) further asserts that modernization in education results in modern facilities, infrastructure, and instructional resources, along with a diverse range of extracurricular activities aimed at fostering the holistic development of students. Modernizing education is about providing educators and students with the best possible learning environments and the essential tools to compete effectively in the global arena. As a result, modernization brings about social change, influencing various aspects of life, including modes of thought, attire, transportation, and communication.

School Facilities

Facilities as described by South African Facilities Management Association (SAFMA) (cited in Chikafalimani et al 2021) are all physical entities where products or services are created, stored and distributed. Facilities are the materials that enable trained and professional personnel to achieve a particular individual or organizational task easily, efficiently and effectively. Nuru,

(2014) referred to facilities in education to the materials that a trained and professional teacher utilizes to successfully translate, implement and achieve school instruction objectives. Educational facilities are those materials that enable teaching and learning to students in school (Manabete & Makinde 2016). The National Clearinghouse for Educational Facilities (2004) describe school facilities as the physical infrastructure, including buildings, grounds, and equipment, that is essential for the operation of a school. It involves the physical facilities and resources provided by educational institutions to support teaching, learning, and the overall educational experience of students. These facilities encompass a wide range of physical spaces, equipment, and resources, which are vital for the effective functioning of schools and the well-being of students and staff. These facilities serve various functions and support educational activities, from instruction to extracurricular activities, and contribute to the overall well-being of students and staff.

School facilities play a pivotal role in shaping the quality of education and the overall learning experience for students. These physical spaces, which encompass classrooms, laboratories, libraries, sports facilities, and more, are not just the backdrop for academic activities but are integral to the process of imparting knowledge and fostering personal growth. The significance of modern, well-equipped school facilities cannot be overstated, as they provide the essential infrastructure for effective teaching and learning. In this era of global education excellence, as regions and nations strive to equip their students with the skills and knowledge needed to thrive in the 21st century, the modernization of school facilities has emerged as a crucial agenda (National Clearinghouse for Educational Facilities 2008). The focus is not merely on aesthetics but on creating dynamic, adaptable, and technologically advanced environments that promote innovative teaching methods and encourage students to become critical thinkers and problem solvers.

Impact of Modernized School Facilities

As teaching methods evolve, so too may the need for modifications in school structures to accommodate these changes. Current pedagogical models demand more versatile classroom spaces, as exemplified by the shift away from the traditional single-classroom setup. In this modern educational landscape, students often engage in collaborative small-group work and utilize shared areas between classrooms, a feature prevalent in the newest elementary school designs.

Modernization facilitates more interactive and engaging learning experiences by leveraging technology, multimedia resources, and interactive platforms. Adaptive technologies and online resources enable tailored learning experiences that cater to individual student needs and learning preferences. Furthermore, modernization opens up opportunities for remote and online education, broadening educational access, particularly for learners in remote or underserved areas. As Wali (2016) elucidates, modernized school facilities offer flexibility in scheduling, enabling individuals to balance education with other commitments more effectively. It also encourages global collaboration, facilitating connections between students and educators with peers and experts worldwide. This global perspective enriches students' understanding of diverse cultures and global issues. Additionally, modernization equips students with essential digital literacy skills, preparing them for the demands of the digital age and future job market.

Categories of Modernized School Facilities

Modernized school facilities play a pivotal role in shaping the educational experience of students and the overall effectiveness of educational institutions. These facilities go beyond the traditional brick-and-mortar structures; they encompass a wide range of environments, resources, and technologies that are thoughtfully designed to enhance learning, safety, and sustainability. In the pursuit of educational excellence, the categories of modernized school facilities have evolved to meet the changing needs and aspirations of students and educators. These categories not only reflect advancements in technology and pedagogy but also address the broader goals of fostering creativity, sustainability, and holistic student development which include:

a. Smart classrooms

A smart classroom, also known as a digital classroom or technology-enhanced classroom, is an innovative educational space that incorporates advanced technology and digital tools to facilitate more engaging and interactive learning experiences (Joshi & Lai 2017). Alghazo (2016) consider smart classroom as combination of technology components designed to create an immersive and dynamic learning environment. These components often include interactive whiteboards, digital projectors, audio-visual equipment, computer stations, internet connectivity, and various software applications. Smart classrooms aim to transform traditional teaching methods into interactive, multimedia-rich experiences that cater to diverse learning styles. It leverage technology to enhance teaching, encourage active participation, and improve overall educational outcomes.

Smart classrooms have emerged as a transformative force in modern education, reshaping the traditional learning landscape and equipping students and educators with powerful tools to enhance the teaching and learning experience. Leveraging cutting-edge technology, these technologically enriched environments are designed to foster creativity, engagement, and efficiency in educational settings. As the digital age continues to evolve, smart classrooms play a pivotal role in preparing students for a future defined by rapid technological advancement and innovation (Johnson, Adams & Cummins (2012). Among them include:

Components of Smart Classrooms

1. *Interactive Whiteboards (IWBs)*: Interactive whiteboards, such as SMART Boards, are prominent features in smart classrooms. These large touch-sensitive displays allow educators to project digital content and engage students through interactive lessons, making learning more immersive and participatory (Bebell & O'Dwyer, 2010).
2. *Audio-Visual systems*: Smart classrooms are equipped with advanced audio-visual systems, including high-definition projectors, speakers, and microphones. These components enhance multimedia content delivery, making it more engaging and accessible (Akyüz & Samsa, 2018).
3. *Learning management systems (LMS)*: LMS platforms like Moodle or Blackboard are integrated into smart classrooms to facilitate course management, content delivery, assessment, and student-teacher communication (Alstete, 2015).

4. *Document cameras*: Document cameras enable educators to display physical documents, textbooks, and 3D objects, making it easier to incorporate a variety of learning materials into their lessons.
5. *Student devices*: Many smart classrooms provide students with laptops, tablets, or other personal devices, fostering personalized learning experiences and access to digital resources (Bebell & Kay, 2010).
6. *Internet Connectivity*: High-speed internet connections are a fundamental component of smart classrooms, ensuring access to online resources, research, and collaboration tools (Penuel & Gallagher, 2017).
7. *Learning apps and software*: A wide array of educational software and apps are used in smart classrooms to support different learning objectives and activities.
8. *Collaboration tools*: Smart classrooms often feature collaborative software and tools that allow students to work together on projects, whether they are in the same room or connecting with peers globally (Chen, Bastedo & Howard 2018).
9. *Video conferencing equipment*: Video conferencing technology enables remote guest lectures and virtual field trips, broadening the horizons of learning beyond the physical classroom (Song Kim, Song, Yoo & Lee 2020).

Smart classrooms have demonstrated the potential to enhance student engagement, improve learning outcomes, and prepare students for the digital age. However, successful implementation relies not only on the technology but also on effective pedagogical strategies and teacher training.

b. STEM Labs

STEM Labs, short for Science, Technology, Engineering, and Mathematics laboratories, represent a dynamic and forward-thinking approach to education in the 21st century. National Research Council (2011) report that these specialized learning spaces are designed to inspire and empower students in their exploration of the critical disciplines that drive innovation and technological advancement. National Science Foundation (2021) note that STEM education has gained immense importance in recent years, as it equips students with the skills and knowledge needed to address complex real-world challenges and prepares them for future careers in an increasingly STEM-focused world. STEM Labs has significantly transformative role in shaping the next generation of problem solvers and innovators.

STEM Labs offer students a hands-on, inquiry-based learning experience where they can actively engage with scientific concepts, technology, engineering principles, and mathematical problem-solving (Luft 2015). These labs are equipped with a wide range of cutting-edge tools and resources, including scientific apparatus, computer software, 3D printers, and robotics kits. The aim is to foster curiosity, critical thinking, and collaboration among students, enabling them to tackle real-world issues and develop the skills that are highly sought after in today's job market.

Moreover, STEM Labs provide a platform for students to bridge the gap between theory and practice, encouraging them to apply what they learn in the classroom to tangible, real-world situations. Through hands-on experimentation and projects, students gain a deeper understanding of scientific phenomena, technological advancements, engineering principles, and mathematical concepts, all while nurturing their problem-solving skills and creativity (Honey, Pearson & Schweingruber 2014). In this rapidly evolving technological age, STEM education and the role of STEM Labs are of paramount importance. They are instrumental in preparing students to face the challenges and opportunities presented by emerging technologies, environmental concerns, and global issues.

c. Digital Libraries

A digital library, often referred to as a digital library or electronic library, is a digitalized collection of resources and materials, such as books, articles, multimedia content, manuscripts, and other forms of information and knowledge (Koehler 2017). These digital libraries are accessible through computer networks, including the internet, and provide users with the ability to browse, search, access, and retrieve information in digital format. In the digital age, the concept of libraries has undergone a profound transformation, giving rise to the dynamic realm of Digital Libraries. These virtual repositories of information are redefining how we access, store, and interact with knowledge. Digital Libraries, an evolution of traditional libraries, serve as vast reservoirs of digital content encompassing a wide array of media, from texts and images to audio and video (Borgman 2015). These digital repositories have grown to encompass an extensive variety of content, including scholarly articles, historical archives, multimedia collections, and much more (Saracevic 2010). These components facilitate effective management, searchability, and accessibility of digital resources. Case & Given (2016) develop them as:

1. *Content repository*: The content repository is where digital resources are stored. It includes text documents, images, videos, audio files, and other types of digital materials. A well-organized content repository ensures that students can easily access a wide range of digital resources, from textbooks to research papers and multimedia materials. This accessibility broadens students' knowledge base and supports their academic pursuits.
2. *Metadata and cataloging*: Metadata is essential for describing and categorizing digital resources. This includes information such as title, author, date, keywords, and other descriptive data. Metadata and cataloging facilitate efficient searching and discovery of digital resources. Students can quickly find relevant materials, saving time and improving their research effectiveness.
3. *User interface*: The user interface is the part of the digital library that users interact with. It includes search features, browsing capabilities, and tools for accessing and using digital resources. An intuitive user interface enhances the overall user experience. Students can easily navigate the digital library, making it more user-friendly and encouraging frequent use.
4. *Search and retrieval systems*: These systems enable users to search for and retrieve digital resources efficiently. They often include search engines and advanced querying capabilities. Effective search and retrieval systems empower students to locate specific information quickly. This capability boosts their research and information literacy skills.

5. *Digital preservation*: Digital preservation ensures the long-term accessibility of digital resources by protecting them from degradation, technological obsolescence, and data loss. Digital preservation ensures that students have access to resources over the long term. This commitment to preservation safeguards valuable educational materials for current and future students.
6. *Access control and security*: Digital libraries often include access control mechanisms to protect sensitive content and ensure that only authorized users can access certain resources. Access control mechanisms protect sensitive content and intellectual property, providing students with a secure learning environment. Students can trust that their academic work is safeguarded.
7. *Interoperability and standards*: Digital libraries adhere to standards that enable interoperability with other systems and ensure the long-term preservation and access to digital resources. Interoperability ensures that digital libraries can work seamlessly with other educational systems, allowing students to access diverse learning tools and resources from a single platform.
8. *User services and support*: Digital libraries may provide user services such as reference assistance, tutorials, and user support to assist users in finding and using digital resources. User services, such as reference assistance and tutorials, assist students in effectively using the digital library. This support enhances their information-seeking and research skills.

d. Flexible Learning Spaces

Flexible Learning Spaces, also known as flexible classrooms or adaptable learning environments, are educational spaces designed to cater to diverse learning needs, promote student engagement, and facilitate active and dynamic teaching methods (Radcliffe & Wilson 2016). These spaces can be reconfigured to support a variety of teaching styles, learning activities, and group sizes, enhancing the overall learning experience. Barrett, Zhang, Davies & Barrett (2015) observe that the adaptable and technology-rich spaces have become a hallmark of modern educational institutions, aiming to enhance the learning experience by accommodating diverse teaching methods, fostering student engagement, and promoting active and collaborative learning. In this introduction, we delve into the concept of flexible learning spaces, explore their significance, and highlight their potential to revolutionize contemporary education. The conventional classroom setup, characterized by rows of static desks and a fixed podium, is increasingly giving way to flexible learning spaces. By offering a versatile and ever-changing environment, flexible learning spaces open the door to a wide range of pedagogical approaches, from traditional lectures to group discussions, hands-on activities, and technology-enhanced learning. Radcliffe & Wilson (2016) highlight the various aspects of flexible learning space as:

1. *Collaborative learning spaces*: These spaces feature furniture and layouts that facilitate group work, discussion, and collaborative projects. Collaborative learning spaces promote teamwork, communication, and problem-solving skills. They encourage peer-to-peer learning and offer a supportive environment for students to exchange ideas and work together effectively.
2. *Active learning classrooms*: These spaces feature movable furniture, technology integration, and interactive displays to support active and student-centered teaching methods. Active learning classrooms shift the focus from passive listening to active participation. They enhance student engagement, critical thinking, and knowledge retention. Students are more likely to ask questions and contribute to discussions.

3. *Technology-enhanced spaces*: These spaces are equipped with advanced technology; including interactive whiteboards, multimedia resources, and connectivity for digital learning. Technology-enhanced spaces enable digital and blended learning approaches. They prepare students for the digital age and foster digital literacy. Students can access a wide range of digital resources, making learning more interactive and engaging.

4. *Quiet and reflective spaces*: These spaces offer a tranquil environment for individual study, reflection, and concentration. Quiet spaces provide students with the solitude they need for focused study. They can be especially beneficial for introverted learners. Students have a place to think deeply, read, and engage in self-directed learning.

5. *Makerspaces*: Makerspaces are hands-on and creative spaces equipped with tools and materials for design, prototyping, and experimentation. Makerspaces promote innovation, creativity, and hands-on learning. They encourage students to develop problem-solving skills, creativity, and a deep understanding of STEM concepts.

7. *Lecture capture spaces*: These spaces are equipped with video recording and streaming technology to capture lectures and presentations. Lecture capture spaces allow for the flexible delivery of content. Students can review lectures, access missed classes, and study at their own pace, enhancing accessibility and convenience.

e. Virtual Learning Environments

Virtual Learning Environments (VLEs) are online platforms that have revolutionized the way education and training are delivered in the digital age (Ali 2020). They provide a comprehensive and interactive space for learners and instructors to engage in a wide range of educational activities. Virtual Learning Environments, often referred to as Learning Management Systems (LMS) or online learning platforms, are digital ecosystems designed to support the creation, delivery, and management of educational content and activities in an online or blended learning setting (EdTechReview 2021). These platforms serve as a hub for educators, students, and administrators to interact, collaborate, and access resources regardless of geographical location.

VLEs have gained prominence due to their ability to adapt to the changing landscape of education and training, allowing for greater flexibility, accessibility, and scalability. They offer a diverse range of features and tools, including content management, communication, assessment, and analytics, all aimed at enhancing the learning experience and improving educational outcomes.

f. Advanced Security Systems

Advanced security systems refer to a comprehensive and sophisticated set of technologies, practices, and measures designed to protect assets, information, and individuals from various threats and risks (Dogan 2019). These systems are engineered to provide enhanced security, both in physical and digital realms. They employ cutting-edge technologies, often incorporating automation and artificial intelligence, to safeguard against a wide range of security challenges.

Advanced security systems play a crucial role in the modernization of education by ensuring the safety of students, staff, and valuable resources. As educational institutions adopt digital technologies and online learning platforms, the need for robust security measures has become more important than ever. Advanced security systems play a pivotal role in not only fortifying the physical safety of educational environments but also in ensuring the integrity and confidentiality of sensitive information in the digital realm. By encompassing a diverse array of technologies, from biometric authentication to state-of-the-art surveillance, physical campus security, data protection, cybersecurity, and these systems create a secure ecosystem that fosters an optimal learning environment.

Conclusion

The modernization of school facilities represents a dynamic shift in education, one that acknowledges the ever-evolving needs and expectations of both students and educators. The categories of modernized school facilities reflect a commitment to providing an environment that nurtures creativity, innovation, and academic excellence. These modernized facilities not only support advanced teaching methods but also contribute to the holistic development of students. In addition, modern school facilities recognize the importance of sustainability, safety, and inclusivity, ensuring that students not only receive a high-quality education but also do so in a safe, environmentally responsible, and equitable environment. As education continues to evolve in the 21st century, modernized school facilities are essential components of this transformation, enabling students to excel academically, develop critical skills, and become well-rounded individuals prepared to meet the challenges of an ever-changing world. The commitment to modernization serves as a testament to the enduring value of education and its power to shape the future.

Recommendations

This paper recommends that:

1. Educational institutions should prioritize investments in modern technology and digital resources to enhance teaching and learning. This includes ensuring that classrooms are equipped with the latest educational technology, and that educators receive training in its effective use.
2. Modernized facilities require consistent maintenance and upkeep to ensure they remain effective and safe hence well developed long-term plans for facility maintenance and renovations should be ensure by the relevant authority.
3. The educational authorities should provide opportunities for ongoing professional development for teachers, particularly in the effective use of technology and modern teaching methods in updated facilities.

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