

School Management in 21st Century Using ICT: Challenges and the Way Forward

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Abstract: This paper discusses the use of information and communication technology in managing schools and its attendant benefits. It particularly seeks to find out how far ICT has helped to bring about enhancement in school management in our present age. It also seeks to discover the basic challenges that school managers are facing currently in deploying ICT for school management. Our motivation for this paper is the fact that irrespective of the enormous benefits that ICT offers in service delivery, many schools seem not to be deploying ICT in school management. Those that are using ICT in school management currently seem to be facing some challenges that needed to be addressed. This paper therefore highlights the challenges facing the use of ICT in school management in this 21st century and consequently recommends ways forward by outlining and discusses in details mapping solutions that serves as panacea to those highlighted challenges facing school managers and administrators in the use of ICT in school administration. The implementation of the recommended solutions will have no doubt boost the confidence of the present day and would-be school managers in deploying ICT in their schools. It is worthy of note that school management using ICT has enormous impacts on nation building and development. It would help enforce electronic record keeping which cannot easily be lost and can be viewed as authentic registers or instruments of official accounts of any transaction performed in schools.

Keywords: School, Administration, ICT, Challenges, Solution

1. Introduction

The society we have, including the identity and cohesion within that society and its understanding and acceptance of other societies, is seen to be largely created in our schools. Schools are one of the few remaining institutions to offer partnerships to families in socialization and investment through learning. School education helps people make sense of the changes as well as fostering sustainability, including through lifelong learning. The creation, acquisition, communication and wise use of knowledge are of particular importance. In brief, society's most important investment is increasingly seen to be in the education of its people - we suffer in the absence of good education: we prosper in its presence. In this situation of high expectations of each country's educational provision, those leading schools have an enormous responsibility. It is no wonder that the "school improvement movement of the past 20 years has put a great emphasis on the role of leaders." [10].

"Effective school leaders are keys to large-scale, sustainable education reform." [4]. Not only are school administrators important but also they are generally seen to be taking on more and more roles. ICT application in schools covers a wider scope. This includes the comprehensive approach to innovate education systems, methods, and management through Information Communications Technology, restructuring education system, diversifying teaching-learning methods & practices, engaging all stakeholders of education and adapting rapid to changes in society and the environment and enhancing education efficiency, effectiveness, and productivity [6]. In the administration of the school, ICT can also be applicable in the administering of human, physical and financial resources. Application of ICT offers a wonderful potential for increasing school accountability, transparency and participation among various stakeholders [2]. ICT has been successfully used in various activities ranging from monitoring campaign finance spending to reporting election fraud in through SMS

messages. This underscores ICT's ability to empower stakeholders in civil society, government, and the broader population to achieve better outcomes in transparency and anticorruption efforts [11]. With specific reference to the administration of school financial resources among other things, information and communication technology can help solve the centralization/decentralization dilemma by making relevant revenue and expenditure data easily available at all school levels. It can also be used to facilitate budget analysis and school programming and thus improving the timeliness of the school budget information.

2. Historical Review of Origin of School

For deeper understanding of school and its' related terms, we have to dwell with retrospect to the history, origin, theories, methods, and administration of schools and other agencies of information from ancient times to the present. Education developed from the human struggle for survival and enlightenment. It may be formal or informal. Informal education refers to the general social process by which human beings acquire the knowledge and skills needed to function in their culture. Formal education refers to the process by which teachers instruct students in courses of study within institutions.

- 1) **School in the ancient time:** Before the invention of reading and writing, people lived in an environment in which they struggled to survive against natural forces, animals, and other humans. To survive, preliterate people developed skill that grew into cultural and educational patterns. For a particular group's culture to continue into the future, people had to transmit it, or pass it on, from adults to children. The earliest educational processes involved sharing information about gathering food and providing shelter; making weapons and other tools; learning language; and acquiring the values, behavior, and religious rites or practices of a given culture.

2) **School in medieval period:** The education and learning during the medieval periods was shaped overwhelmingly by the effort of Saint Thomas Aquinas, an Italian philosopher and theologian. His work attempted to reconcile the philosophy of Aristotle with the ideas of Christian theologian Saint Augustine. Aquinas employed both reason and faith in the study of metaphysics, moral philosophy, and religion. During the middle Ages, or the medieval period, which lasted roughly from the 5th to the 15th century, Western society and education were heavily shaped by Christianity, particularly the Roman Catholic Church. The Church operated parish, chapel, and monastery schools at the elementary level. Schools in monasteries and cathedrals offered secondary education. Much of the teaching in these schools was directed at learning Latin, the old Roman language used by the church in its ceremonies and teachings. Schools were attended primarily by persons planning to enter religious life such as priests, monks, or nuns. The vast majority of people were serfs who served as agricultural workers on the estates of feudal lords. The serfs, who did not attend school, were generally illiterate. Teachers and instructors employed the concepts of reason and revelation to teach their students how to think. In this 15th-century Italian painting, parents take their children to see a teacher of grammar. As nations gelled and became more centralized and civilized, national leaders saw schooling as means of creating good patriots and future soldiers. To them, the crucial lessons were about the glories of the fatherland, the wondrous achievements and moral virtues of the nation's founders and leaders, and the necessity to defend the nation from evil forces elsewhere.

3) **School in the 20th century:** The 20th century has also been marked by the emergence of national school systems among developing nations, particularly in Asia and Africa. Compulsory elementary education has become nearly universal, but evidence indicates that large numbers of children—perhaps as many as 50 percent of those age 6 to 18 throughout the world—do not attend school. To improve education on the elementary and adult levels, the United Nations Educational, Scientific and Cultural Organization (UNESCO) conducts literacy campaigns and other educational projects. UNESCO attempts to put every child in the world into school and to eliminate illiteracy. Some progress has been noted, but it has become obvious that considerable time and effort are needed to produce universal literacy.

3. Definitions and Explanation

There is no doubt that modern life is dominated by technology, and management/administration of educational institutions is not exceptional, universally, there is a conspicuous recognition of the need to integrate Information and Communication Technology (ICT) in our educational system especially in this era of globalization where information flows freely through satellite and their interaction for global dissemination of knowledge. Information could be perceived as the life-wire of any organization including education.

Information Communication Technology (ICT) is a generic term that implies a range of technologies for gathering, storing, retrieving, processing, analyzing, and transmitting information different. The education that the past century learners have experienced is no longer appropriate for preparing today's learner for a global market. For this singular motivation, 21st century education proponents argue that the world no longer seek to reform education but education must be transformed and revolutionize into something entirely. Huge social changes, such as growing diversity and population mobility, present educators with new and constantly changing circumstances. As a result, the characteristics which defined the successful education systems of the past are unlikely to be those which will define success in the future. "The effect of high stakes assessments has resulted in many school districts shifting focus from resource rich curriculum and best practice instruction to a focus on what is tested, thus diminishing the standards and subject areas that are not assessed. Similarly the extent to which ICT has been deployed in secondary school managerial systems needs to be assessed.

ICT could also be seen as an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as videoconferencing and distance learning. ICTs are often spoken of in a particular context, such as ICTs in education, health care, or libraries. Consequently, the use of the internet has become far more common than it used to be neither did curriculum authorities (planners), school managers/administrators or education boards able to grasp the full implications of this complete overthrow for today's school management. There is no longer any reason/need to base school management/administration around on just manual collation of data, heaping of exam script or even stacking of file cabinet.

4. 21st Century School Management and Tools Being Used

Achieving 21st century school management and administration requires us to reconsider what and how we want students to learn and interact and the role of teachers in knowledge impartation. Many of the curriculum used and courses being taught right now have changed little in more than ten decades now. Groups such as the Partnership for 21st Century Skills (P21) offer ideas and strategies for modifying curriculum and core subjects to include 21st century themes, such as global literacy and environmental literacy, and recommend that we include skills like creativity and innovation, leadership and responsibility, and communication and collaboration in the discussion as we determine new academic outcomes. As we all chant the mantra of being "lifelong administrators," but professional development for many administrators or managers continues to be a hit or miss proposition, particularly when it comes to 21st century skills. Time and money are often quoted as inhibiting factors to providing effective and sustained professional development, but these are just the obvious issues. We must look beyond the easy targets of financial and scheduling constraints to examine and hone the

underlying paradigm we use as the cornerstone for our professional development efforts.

Our 21st century administrators need to be effective instructional and technological leaders in their schools, actively participating in the selection and implementation of the tools teachers will use to engage students and improve learning. In the past, IT departments were tasked with making technology decisions, with much of the technology focus concerned with blocking access to inappropriate content. Effective selection of modern technology tools requires understanding of the instructional needs and goals of modern educators. 21st century administrators should expect teachers to demonstrate how tools like blogs, wikis, Google apps, Twitter, and other social networking and Web 2.0 technologies can be used to support students in meeting the expectations that have been set forth for a 21st century learning. The 21st century school management involves a collection of sophisticated tools such as videoconferencing, virtual laboratories, screen-casts, e-mails, forums, search engines, blogs, podcasts, vod-casts, wikis, vokis, high-tech 3D graphics, e-Groups, learning dialogue videos, learning-by-doing videos, digital game/toy-based learning and flipped-classrooms, virtual classrooms, 3D-animations and high-tech multimedia with associated pedagogy of active learning which have quickly emerged as the backbone of effective education in this century. In fact, blended learning is the necessity of 21st century.

In order fully benefit from the current era of information, all hands should be equipped with the appropriate knowledge and skills related to it. However, capacity building and ICT literacy are very essential factor to be considered the authorities especially in the field of education [12].

5. Challenges in School Management and Administration

Today's school managers and administrators face unique challenges never encountered or even imagined by their predecessors. Preparing students to thrive in a global, technologically advanced society where they must use digital tools that evolve at a blistering pace to succeed at careers that did not even exist a decade ago is a daunting task! Information processing skills have become a survival skill nearly ubiquitous access to mountains of Web-based information may expose learners to more information in just one day than those of previous generations would have been able to access in a lifetime. In order to prepare students for their future, teachers must have the support and leadership of school administrators who understand 21st century skills.

Despite the enormous roles of ICT in school administration and management, there are glaring challenges and obstacles militating against its effective use for school management. Here, this paper tries to highlight the challenges facing the use of ICT in school management in this 21st century and consequently recommend ways forward.

Several challenges militate against the effective use of ICT in school management, these ranges from;

- Cost effectiveness of computer hardware and software

- Infrastructural deficiencies
- Limited/no access to the internet
- Non-available of skilled ICT personnel
- Lack of specific and Inadequate availability of relevant software
- Lack of maintenance culture
- Lack data security and impurity in the side of the government
- Incompatible hardware and software

(1) **Cost effectiveness of computer hardware & software:**

For any school to have an effective school management system they must make available an appreciable number of computer systems with the necessary software application installed on them, however, the price for the procurement of these electronic gadgets (computer) is always on the high side especially in developing countries. Some school don't even have books and other adequate infrastructures such as good classroom not to talk of having good ICT laboratory with working system and the appropriate peripherals such printers, keyboard installed. This challenge has really created a lot of digital gap/divide on some schools who cannot afford to raise the huge amount of money involved in procurement of computer system making it difficult for them to integrate ICT into their school administration.

(2) **Infrastructural Deficiencies:** A very common formidable challenge that impedes the use of ICT is infrastructural deficiencies. ICT gadgets naturally have composite demands in the sense that other infrastructures such as furniture, electricity (power) and cool weather condition must be provided to provide energy, and comfortable environment to whatever ICT gadget you are using within your school. Consequently, to keep high-tech equipment such as computer functioning properly, especially under extreme weather condition as obtained in some developing nation there must be adequate provision for power and backup. So, in places where the schools have no access to electricity (power) or its alternative, it is virtually difficult for them to take advantage benefiting from the use of ICT gadget such as computers, radios, television, videos recorders. Therefore, lack of electricity and other alternative sources of power supply in schools affect the use of ICT in school administration and management.

(3) **Limited/no access to the internet:** Another challenge in school management using ICT is limited/no access to the internet. The bedrock of every School Management System (SMS) using ICT is the internet through which activities are carried out on the cloud, and an absence of this internet connection means that information/data being manipulated in any school with no internet access remain local and doesn't go beyond that school and hence cannot be accessed by the targeted audience (variety of users).

(4) **Non-availability of skilled personnel:** A situation where there are provisions of adequate ICT badges with good suitable supply but lacked the necessary human skill and knowledge to fully manage them is still a strong challenge to the use of ICT in school management. Schools need to have well trained and skilled personnel who are versatile in the area of ICT to handle the installation of ICT gadgets. In many schools in some

developing countries, those charged with the use and management of the computer do not or at worst cases do not receive any training at all and this poses great challenge to the effective use of ICT in school management/ administration.

(5) **Inadequate availability of relevant software:** Due to cultural inequalities in both developed and developing nations, it is difficult to find a software that have universal application due to the differences in educational standards, policies and requirement which doesn't allow for integration into curriculum across nations. However, inadequate availability of specific and relevant software is a major challenge working against the use of ICT in school administration/management.

(6) **Lack of maintenance culture:** Consequent to continuous usage, ICT gadgets wear down over time and as a result needs to be maintained, repaired and restored. Therefore when there is no provision for routine maintenance of ICT gadgets, it leads to a total breakdown of the equipment thereby undermining their efficient and effective use in school administration and management.

(7) **Lack of data security & punitive measure:** ICT deal with the movement and manipulation of data/information from one department to another through the cloud, and lack of access control and data integrity jeopardizes the essence of ICT integration in school management and administration. Also lack of punitive measures on the side of an institution or the government poses great challenge on the use of ICT in school management and administration. Allowing intruders and unauthorized users to have access to schools record/data and failure to punish offenders have significant challenges in the use of ICT in school administration.

(8) **Incompatible Hardware and Software:** Traditionally, school management and administration has been impeded by the security and other potential dangers of employing social networking technologies [5]. Most schools in our research were using corporate networking systems which in other words implies that their hardware provision and connectivity were managed by a controlling agency such as a local authority which, invariably used Windows based systems running on corporate servers. This often caused problems for those schools using devices like the iPod Touch and the iPad which were not designed to support a corporate or networked technology solution which "still underpins the technology paradigm evident in most local authorities and schools" [3]

6. The Way Forward

Information and Communication Technology in the hands of *well-prepared, skillful managers and administrators* can be a significant accelerant for transforming the school into a high-quality and relevant 21st Century learning environment in which student capacity to critically think, collaborate, innovate, and communicate can become deeper, broader, and more connected to the real world. To be effective leaders for the 21st century, administrators must ensure that instructional needs, the expertise of teachers, and the ultimate needs of students are considered. These 21st century administrators should be the facilitators of a dialogue that asks:

- What **outcomes** do we want to accomplish in the classroom?
- What available **tools and resources** can and will support teachers in helping their students meet these outcomes?
- What **preparation** do we need to ensure teachers and students appropriately utilize tools and resources?
- How will we **measure** the effectiveness of these tools to gauge how well they support and improve teaching and learning?

For effective and efficient use of ICT in school management and administration, the following must be put in place are;

- Government and non-governmental organizations at all level of governance should make available to school ICT gadget at subsidized rates or even for free.
- School managers should partner or collaborate with non-governmental organizations (NGOs) and the government to make available to schools adequate power supply and other infrastructures such as furniture, goods atmosphere needed for a good ICT integration in school administration.
- Access to fast internet connections should be made available in schools to give room for seamless communication among staff, students, alumni and parent at any moment. This internet access should be made free for school managers and students alike.
- School leaders/managers should develop ICT skill in order to be effective in their new role as a technology usage leader [12], [9]. While these school leaders develop ICT skill; Government, school managers and those responsible for employment and recruitment of staff should make sure that those deployed to work in ICT department of schools are people who have acquired the adequate training in application software, operating system, network administration and repair of computer facilities.
- Software developers and publishers should come up with development of software and multimedia application that will have universal relevance and application which will not be specific and particular to any culture and religion while the government on their own should try to make these software available to schools that might need them.
- School leaders and administrator should enforce maintenance culture in their school and make sure that their ICT gadgets are properly taken care of and maintained at regular interval(routinely) and ensure that those to carry out these exercise are those that have the requisite and adequate skill to do so under proper supervision.
- Another way out in surmounting the challenges in the use of ICT in school management is to ensure that adequate security measures and policies are enforced consequent punitive measures taken against various offenders of such policies. In addition, the ICT department of ministry of education should conduct ICT training programmes, seminars, workshops and design various forums focusing on professional development of administrators in integrating ICT across school administrations to become ICT compliant [13], [1].

7. Benefits of Using ICT in School Administration and Management

ICTs provide a great solution for information collection and sharing, making administration and management more relaxed and productive for all, anytime and anywhere. Tools like free and open source software (FOSS), and websites like github.com and SourceForge.net, help teachers and students with knowledge building, reflection, sharing and collaboration in project work. ICTs also promote self-evaluation and self-study via online tools. Users can learn in their own dialects, which fills the gap of language barrier in teaching-learning process.

School administration and management using ICT x-rays the fact that its application in education contribute immensely to archive universal education globally [12].

8. Recommendation

Sequel to the fact that lack of adequate facilities negatively affects the application of ICT in the school administration, it may be recommended that school administrators in collaboration with parents and other stakeholders in the school should come together and contribute meaningfully in their own small measures towards the provision of ICT the facilities to their school. This will help in improving the adequacy of ICT related facilities in the school.

- The school management should adopt best resource management practices that will expedite the process of monitoring the adequacy and status of the available ICT related resources in the school. Moreover, in this line, rules and regulations should be set to ensure adequate security is provided to the available facilities so as to prevent them from being stolen or destruction from viruses.
- Students should be highly encouraged by the school administrators and management to take up ICT classes so as to acquire more knowledge on how they may be able to use ICT effectively. Through these classes, they may also be taught on how they may opt to use ICT for carrying out academic and financial transactions for instance when paying school fees through e-banking or e-transactions. Further, orientations need also to be provided to the school administration on the benefits of electronic transactions to the organization.
- Teachers on their own need to be educated on how they can incorporate ICT in the school curriculum effectively. This may be done through seminars and workshops where teachers get to be enlightened with the techniques or modern styles of teaching which support the usage of ICT equipments such as laptops, videos, radios, multimedia and projectors to teach.
- Consequently, there is also need for more education of ICT adoption training among teachers and school managers in using ICT for administrative and formative purposes.
- The government on their own through the ministry of education and its affiliate ministries should implement projects that will see to it that all public schools that still use outdated and obsolete systems and applications are all

upgraded and updated. If not possible, then they should ensure that the schools are supplied with facilities that are current in terms of software and latest systems of operations. This will make it easier for the administrators to apply the facilities in various aspects not limiting themselves only to the use of word documents.

- The government in collaboration with school administrators and facilitators should come up with a campaign program that will be geared towards enriching all the stakeholders in schools on the essence and benefits of ICT application in the overall day to day running of activities in their respective schools.
- The government through the ministry of education and technology should enact policies that will provide a framework on the various functions of ICT and how the school administrators may utilize it in being a 100% effective in executing their administrative roles in the school. However, the formulation of such policies should be done in collaboration with school administrators and teachers so that they can feel being part of the major step integrating ICT in schools for administration purposes.

9. Conclusion

Information and communication technologies (ICTs) have brought about a paradigm shift in school management and administration. School Management using ICT provides online solutions to support a school's diverse operations related to the administration and management of the entire staff/student's life-cycle and of the school itself. The administration and management of any school using ICT borders on delivery but not limited to the following key features; user management, reporting, Student/staff management, Course/subject management, Exam/result management, fees management and processing, Admission management and overall school administration. However, it is worthy of note that school management using ICT has enormous impacts on nation building and development by enforcing electronic record keeping which cannot easily be lost and can be viewed as authentic registers or instruments of official accounts of transaction or occurrence which are preserved in the school's office and are retrieved and accessed when needed, task scheduling is another good aspect of school management using ICT to maximize instructional time, provide time to meet the needs of students and staff, and also time to organize various curricular and extra-curricular activities within and outside the school. School management using ICT has another great significance in the communication and interaction between students, staff, parents and other important stakeholders in the school as it depicts vehicle for developing awareness and orientation among teachers, students, and parents of their role in the administrative, learning and management processes. As society becomes increasingly dependent on technology, schools are investing more time and money in technological means of communication. Access to computer and Internet technologies is increasing all over the world in schools and other work places.

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