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Application of Digital Surveillance as a Managerial Tool for Quality Assurance in Secondary Schools in Rivers State, Nigeria

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Abstract:

This study examined 'Application of Digital Surveillance as a Managerial Tool for Quality Assurance in Secondary Schools in Rivers State, Nigeria.' Two research questions and two null hypotheses guided the study. The study adopted descriptive research design. The population comprised all the 258 principals in the 258 public secondary schools in Rivers State. A sample of 175 principals (94 males and 81 females), which represents 68%, was drawn from the population. The simple random sampling technique was used to select 175 schools, from which the principals were selected. The instrument that was used for data collection was a self-designed 15-item questionnaire entitled: 'Application of Digital Surveillance for Quality Assurance Questionnaire (ADSQSQ).' The questionnaire was structured after the four-point modified Likert rating scale, and was duly validated. The reliability of the instrument was tested using the Cronbach's Alpha method to establish the internal consistency of the questionnaire items, and the coefficient of 0.81 and 0.69 were obtained for the two clusters respectively. The research questions were answered using mean and standard deviation while z-test was used to test the null hypotheses at 0.05 level of significance. The findings of the study revealed, among others, that the benefits of the application of digital surveillance to the secondary schools include: instilling desirable behaviour in the students; improving teachers' pedagogical skills; making teachers to be more committed to their teaching tasks; enhancing students' academic engagement and helping to eradicate mass cheating during examinations. It was also discovered that the ways principals can use digital surveillance for quality assurance include: supervising the teaching-learning process in the classroom; monitoring students' behaviour in the class; guiding teachers on their pedagogical skills and ensuring that students learn in a safe learning environment. Based on the findings, it was recommended, among others, that the government should revamp the education sector by installing digital surveillance in the classrooms and also ensure that there is adequate power supply to sustain the initiative.

Keywords: Application, digital, video, CCTV, surveillance, managerial, tool, quality assurance and education

1. Introduction

In today's interconnected and technology-driven world, quality of education has been stressed so much that school managers have no option than to adapt to change, become more creative and innovative in ensuring that educational objectives and goals are attained. It should be noted that quality of education output is the function of its input. In line with this assertion, Kochhar (2000) maintained that the success or failure of a school depends on the ability, supervisory skill, knowledge, personality and professional development of the school administrator. Prensky (2001) pointed out that 21st century school administrators need to be effective instructional and technological leaders who are actively participating in the selection and implementation of the tool's teachers use to engage students and improve learning. In recognition of the prominent role of Information and Communication Technology (ICT) in advancing knowledge and skills necessary for effective functioning in the modern world, the Federal Republic of Nigeria (2014) stipulated that modern technologies shall be increasingly used and improved upon at all levels of the education system. In this direction, forays have also been made into the administration of schools through research in Networking and social media (Afangideh & Nwideeduh, 2010). Hence, principals, as change agents should adopt innovations geared towards meeting societal needs and expectations of schools.

Secondary education in Nigeria is aimed at preparing young school leavers for useful living in the society, as well as higher education for sustainable national development and global competitiveness. Considering the fundamental importance of secondary education in Nigeria, Nwideeduh and Adieme (2016) noted that it is a cornerstone for the empowerment of youths for national development. However, this can only be achieved through creative, innovative and visionary principals. It should be noted that of all the professions in the world, teaching is the only one that is charged with the daunting tasks of creating the human skills and capabilities that contribute to national development. Adedamola

(2014) emphasized that the worth of development of any nation lies in the quality and skills of its human capital. Little wonder education is widely acknowledged as a vehicle and an indicator of development.

Quality is a term used to ascertain how superior or inferior an object is. World Organization of Standardization (in Asiyai, 2013) defined quality as the totality of features and characteristics of a product or service to satisfy stated needs. Relating quality to education, Asiyai and Oghuvbu (2009) defined quality as a measure of how good or bad the products of higher education institutions in Nigeria are in terms of their academic performance and meeting established standards. Thus, for a school to have high quality, it must meet the expectations, needs and aspirations of the society that established it. Onocha (in Olorunsola, 2014) asserted that the quality of education is often linked with such indicators as: quality teachers, improved curriculum, good delivery, quality infrastructure, an environment conducive to learning, provision of adequate learning materials, training and re-training of teachers, improved teacher-student ratio, parental involvement and quality output. Obanya (2007) corroborated these aforementioned indicators and stressed that to ensure qualitative or high standard of education, the teaching force must be qualitatively adequate, well-educated, professionally prepared, pedagogically skilled and well-motivated.

Quality assurance is a mechanism that is adopted in organizations to ensure that the quality of inputs, transforming processes and outputs is maintained. Adepoju (2007) emphasized that quality assurance in school entails the quality of teachers, learning equipment, facilities, instructional materials, school environment, students, curriculum and quality of instructional delivery. Quality assurance is designed to prove and improve the quality of an institution's methods, educational products and outcomes (Oyebode, Oladipo & Adetome, 2008). Asiyai (2013) posited that one of the key building blocks of quality assurance in education is the development of minimum standards, which include: qualification of teachers, the quality of teaching in the institutions, expected educational achievement of students and the development of a more rigorous management process for education so that the entire sector develops effective operating policies and procedures which will always be referenced. Hence, for schools to measure up to societal expectations, the school managers need to perform their role of leadership supervision, which ensures quality. In fact, both the United Nations Educational Scientific and Cultural Organization (UNESCO), and the United Nations Children's Emergency Fund (UNICEF), see quality education as a human right, which supports human development and poverty reduction and promotes social cohesion, social diversity, peace, human security and so on (Arikewuyo, 2010).

In this 21st century, Nigeria and Rivers State in particular are confronted with the demands of globalization, which is characterized by technologies, innovations and competitiveness (Ukaigwe & Adieme, 2018). With the astronomical increase in students' enrolment, coupled with the higher demands on quality education by the knowledge-based society, it becomes expedient that principals adopt the digital or video surveillance technique to monitor what goes on in the classrooms, as well as in the school environment while performing other administrative tasks. Obanya (2014) posited that there must be a paradigm shift from the old ways principals have been performing their duties to the new demands of the knowledge economy by repositioning themselves in a fast-changing world. Regrettably, Babayemi (2006) observed that the demands placed on principals have changed, but their professional techniques have not changed to meet those demands; hence the shortcomings are beginning to tell on the secondary school education system. In order to support teaching and learning processes, Nwogu and Adieme (2018) asserted that principals should ensure quality curricular supervision and provision of adequate physical resources, which are necessary in ensuring that a well-balanced education is provided to learners.

Information technology (IT) has created wide opportunities for educators to integrate technology-supported equipment in the teaching-learning process and to improve the academic achievement of students (Jonassen, 1995). Surveillance generally refers to observation from a distance by means of information technology (IT). Lyon (2007) defined surveillance as the monitoring of behaviour, activities, or information for the purpose of influencing, managing, directing, or protecting. It generally involves observation of individuals or groups by organizations. Electronic equipment (such as closed-circuit television – CCTV), or interception of electronically transmitted information (such as Internet cameras or phone calls), can be used to monitor activities. Gill and Spriggs (2005) explained that CCTV surveillance systems record images which are transmitted to a device, and are made accessible to be examined, studied and/or stored. Thus, CCTV, also known as video/digital surveillance, is a device that can be adopted in schools to ensure that quality assurance is maintained.

Some empirical studies have revealed that installations of CCTV cameras in classrooms in this technological age have proven a veritable tool for monitoring what goes on in the classrooms. The study of Bekker, Hartley and Daves (2012) has proven that surveillance cameras can offer quality security assurance in the school environment. Mgadla (2006) also discovered that installation of CCTV cameras in classrooms helped principals to manage emergency situations. Thus, effective teaching and learning can take place only in a safe and secured school environment. In a related study that was conducted by Naidu and Mhlomo (2008) in South Africa, it was discovered that CCTV cameras in secondary schools monitor learners' behaviour because numerous principals had received horrific reports of learners bringing alcohol and weapons into the premises of various schools, as well as reports of learners sexually harassing others. In another study, Venter (2016) observed that teaching and learning were not carried out in classes until school stakeholders raised concerns about the attitude of teachers and revamped the public schools with the installation of CCTV cameras in classrooms. Tanner-Smith and Fisher (2015) also found out that installation of CCTV cameras helps to eradicate mass cheating during examination. Thus, the adoption of CCTV in Nigerian public schools will enable educational managers to be present everywhere at the same time and also keep records of every activity.

Ashby (2017) posited that video or digital surveillance system can be applied in organizations as a monitoring tool to ensure total quality management (TQM), but warned that it should not be used in policing and infringing on fundamental human rights. Hornes (2006) observed that the installation of CCTV in the classrooms enables principals to

effectively supervise the teaching-learning process. In a study conducted by Jeannine (2013), it was found out that reviewing the CCTV footage with teachers can encourage them to evaluate their teaching methods while striving to provide the best learning environment possible for their students. Armitage (2002) conducted a study which revealed that application of digital surveillance in the school system helped school managers to monitor students' behaviour, know the class that is not learning when it is supposed to, and know teachers who are either under or over-utilized. In another related study, Bates (2008) discovered that with the presence of CCTV cameras, discipline can be easily achieved. Hence, whenever one knows that one's activities are being monitored closely, he or she will learn how to behave well and do the right things at the right time.

1.1. Statement of the Problem

The increasing incidence of crime, truancy, poor academic performance among students and lackadaisical attitudes of some teaching staff in the school organization nowadays have raised doubts and questions in the minds of educational stakeholders as regards the quality of products of the education sector. Despite the efforts the Rivers State Government has made in building more classroom blocks to accommodate students and recruiting qualified teachers for the public secondary schools, there seems not to be much achievement in the quality-of-service delivery. It has been observed that there is a continuous deterioration in students' academic performance over the years. This is evidenced in both internal and external examination results of the students. Again, restiveness among students in public schools is increasing daily. There have been series of cases where students brought drug substances like tramadol and dangerous weapons into the classroom. The recent incident that went viral online, where a student came to school with teargas to confront a classmate which caused pandemonium among students in the classroom, in a secondary school at D/Line in Port Harcourt, Rivers State is a typical example of what students do when they are not being supervised.

However, these scenarios, among others, got the researchers so worried that they began to compare the quality outcomes of the private schools with that of the public schools in Rivers State. It was in the course of this investigation that they discovered that most private schools that perform outstandingly have adopted the CCTV surveillance system in their classrooms to monitor both the activities of teachers and students; thereby ensuring quality. Furthermore, CCTV has been adopted in almost all profit-making organizations in Rivers State, like hotels, retail stores, malls, banks, supermarkets, hospitals, and many others, to satisfy their clients and at the same time maintain quality assurance in this competitive digital world. Hence, the problem of this study borders on adopting the digital/video surveillance system into the learning environments of public secondary schools in Rivers State in order to ensure quality input-process-output.

1.2. Aim and Objectives of the Study

The aim of this study was to apply digital surveillance as a managerial tool for quality assurance in public secondary schools in Rivers State, Nigeria. Specifically, its objectives sought to:

- Examine The Benefits Of Digital Surveillance As A Managerial Tool For Quality Assurance In Secondary Schools In Rivers State; And
- Determine The Ways In Which Digital Surveillance Can Be Applied For Quality Assurance In Secondary Schools In Rivers State.

1.3. Research Questions

The following research questions guided the study:

- What are the benefits of applying digital surveillance for quality assurance in secondary schools in Rivers State?
- In what ways can principals use digital surveillance for quality assurance in secondary schools in Rivers State?

1.4. Hypotheses

The following null hypotheses were formulated for the study:

- Ho₁: There is no significant difference between the mean ratings of male and female principals on the benefits of applying digital surveillance for quality assurance in secondary schools in Rivers State.
- Ho₂: There is no significant difference between the mean ratings of male and female principals on ways principals can use digital surveillance for quality assurance in secondary schools in Rivers State.

2. Methodology

This study adopted the descriptive research design. The population comprised all the 258 principals in the 258 public secondary schools in Rivers State, Nigeria. Out of the 258 principals, 131 are males and 127 are females. A sample of 175 principals (94 males and 81 females), which represents 68%, was drawn from the population. The simple random sampling technique was used to select 175 schools, from which the principals were selected. The instrument that was used for data collection was a self-designed 15-item questionnaire entitled: 'Application of Digital Surveillance for Quality Assurance Questionnaire (ADSQSQ).' The questionnaire was structured after the four-point modified Likert rating scale of Strongly Agree = 4, Agree = 3, Disagree = 2 and Strongly Disagree = 1, and it was duly validated by three experts in Test and Measurement. The reliability of the instrument was tested using the Cronbach's Alpha method to establish the internal consistency of the questionnaire items, and the coefficient of 0.81 and 0.69 were obtained for the two clusters respectively. The research questions were answered using mean and standard deviation while z-test was used to test the null hypotheses at 0.05 level of significance.

3. Results

S/ N	Benefits of Digital/Video/CCTV Surveillance	Male Principals = 94		Female Principals = 81		$\bar{X}_1 \bar{X}_2$	Decision
		\bar{X}_1	SD ₁	\bar{X}_2	SD ₂		
1.	Installation of CCTV cameras in the classrooms will instill desirable behaviour in the students.	2.87	0.74	2.89	0.79	2.88	Agreed
2.	It will improve teachers' pedagogical skills.	2.74	0.75	2.78	0.81	2.76	Agreed
3.	It will make teachers to be more committed to their teaching tasks.	3.01	0.72	3.04	0.78	3.03	Agreed
4.	It will enhance students' academic engagement.	2.93	0.73	2.97	0.79	2.95	Agreed
5.	It curtails truancy in schools.	2.82	0.74	2.85	0.80	2.84	Agreed
6.	It promotes teacher-student class interaction.	2.78	0.75	2.73	0.81	2.76	Agreed
7.	It helps to eradicate mass cheating during examinations.	3.05	0.72	3.09	0.77	3.07	Agreed
8.	It will encourage principal-teacher relationship.	2.16	0.81	2.21	0.87	2.19	Disagreed
9.	It will ensure quality input-process-output in the school system.	2.97	0.53	2.85	0.80	2.91	Agreed
	Aggregate Mean/SD	2.81	0.75	2.83	0.80		

Table 1: Mean Scores and Standard Deviations of the Opinions of Male and Female Principals on the Benefits of Applying Digital Surveillance for Quality Assurance in Secondary Schools in Rivers State

Table 1 shows the mean responses of male and female principals on the benefits of applying digital surveillance for quality assurance in secondary schools in Rivers State. Both male and female principals agreed on items: 1, 2, 3, 4, 5, 6, 7 and 9 in the Table with mean scores greater than the criterion mean of 2.50. However, they disagreed on item 8, which is less than the criterion mean of 2.50. Their aggregate mean scores of 2.81 and 2.80 respectively, indicate that they agreed on the items as the numerous benefits of the application of digital surveillance to the secondary schools in Rivers State. These include: instilling desirable behaviour in the students; improving teachers' pedagogical skills; making teachers to be more committed to their teaching tasks; enhancing students' academic engagement; curtailing truancy in schools; promoting teacher-student class interaction; helping to eradicate mass cheating during examinations and ensuring quality input-process-output in the school system.

S/N	Ways Digital/Video/CCTV Surveillance Can Be Used in the Classrooms Include:	Male Principals = 94		Female Principals = 81		$\bar{X}_1 \bar{X}_2$	Decision
		\bar{X}_1	SD ₁	\bar{X}_2	SD ₂		
10.	Supervising the teaching-learning process in the classroom.	3.03	0.72	3.06	0.78	3.05	Agreed
11.	Monitoring students' behaviour in the class.	2.95	0.73	3.01	0.78	2.98	Agreed
12.	Guiding teachers on their pedagogical skills.	2.92	0.73	2.83	0.80	2.88	Agreed
13.	Detecting students that indulge in examination malpractice.	2.81	0.75	2.89	0.79	2.85	Agreed
14.	Policing teachers' behaviour in the classroom.	1.27	0.91	1.36	0.97	1.32	Disagreed
15.	Ensuring that students learn in a safe learning environment.	2.90	0.74	2.97	0.79	2.94	Agreed
	Aggregate Mean/SD	2.65	0.76	2.69	0.82		

Table 2: Mean Scores and Standard Deviations of the Opinions of Male and Female Principals on the Ways in Which Principals can Use Digital Surveillance for Quality Assurance in Secondary Schools in Rivers State

Table 2 displays the mean responses of male and female principals on the ways they can use digital surveillance for quality assurance in secondary schools in Rivers State. Both male and female principals agreed on items: 10, 11, 12, 13 and 15 in the Table with mean scores greater than the criterion mean of 2.50. However, they disagreed on item 14, which is less than the criterion mean of 2.50. Their aggregate mean scores of 2.65 and 2.69 respectively, indicate that they agreed on the items as ways in which principals can use digital surveillance for quality assurance in secondary schools in Rivers

State. These include: supervising the teaching-learning process in the classroom; monitoring students' behaviour in the class; guiding teachers on their pedagogical skills; detecting students that indulge in examination malpractice and ensuring that students learn in a safe learning environment.

Status	N	\bar{X}	SD	Df	z-cal	Critical Value	Remarks	Decision
Male Principals	94	2.81	0.75	173	-0.17	± 1.96	Not significant	Failed to Reject
Female Principals	81	2.83	0.80					

Table 3: z-test of Difference between Male and Female Principals on the Benefits of Applying Digital Surveillance for Quality Assurance in Secondary Schools in Rivers State
 $P < 0.05$

Table 3 reveals the z-test analysis of the difference in the mean ratings of male and female principals on the benefits of applying digital surveillance for quality assurance in secondary schools in Rivers State. The result shows that z-calculated value of -0.17 is less than the critical value of ± 1.96 ; therefore, the null hypothesis failed to reject at 0.05 alpha level. Thus, there is no significant difference in the mean ratings of male and female principals on the benefits of applying digital surveillance for quality assurance in secondary schools in Rivers State.

Status	N	\bar{X}	SD	Df	z-cal	Critical Value	Remarks	Decision
Male Principals	94	2.81	0.75	173	-0.33	± 1.96	Not significant	Failed to Reject
Female Principals	81	2.83	0.80					

Table 4: z-test of Difference between Male and Female Principals on the Ways in Which Principals can Use Digital Surveillance for Quality Assurance in Secondary Schools in Rivers State
 $P < 0.05$

Table 4 shows the z-test analysis of the difference in the mean ratings of male and female principals on the ways in which principals can use digital surveillance for quality assurance in secondary schools in Rivers State. The result reveals that z-calculated value of -0.33 is less than the critical value of ± 1.96 ; therefore, the null hypothesis failed to reject at 0.05 alpha level. Thus, there is no significant difference in the mean ratings of male and female principals on the ways in which principals can use digital surveillance for quality assurance in secondary schools in Rivers State.

4. Discussion

The finding of this study revealed the benefits of the application of digital surveillance to the secondary schools in Rivers State. These include: instilling desirable behaviour in the students; improving teachers' pedagogical skills; making teachers to be more committed to their teaching tasks; enhancing students' academic engagement; curtailing truancy in schools; promoting teacher-student class interaction; helping to eradicate mass cheating during examinations and ensuring quality input-process-output in the school system. This finding agrees with Bekker, Hartley and Daves (2012); Mgadla (2006), who discovered that installation of CCTV cameras in classrooms helped principals to ensure that students learn in a safe and secure learning environment. The finding is also in line with Naidu and Mhlongo (2008), who conducted a study in South Africa, and found out that the installations CCTV cameras in the classrooms make teachers adhere strictly to the timetables, bearing in mind that their activities are being monitored.

It is also in agreement with Venter (2016); Tanner-Smith and Fisher (2015), who observed in their different studies that the installations of CCTV cameras help the school authority to instill desirable behaviour in unruly and disruptive students. The finding from the test of the null hypothesis revealed that both male and female principals accepted that there are significant benefits of applying digital surveillance for quality assurance in secondary schools in Rivers State. This is also in line with Gill and Spriggs (2005), who observed that adopting digital surveillance to school system is a sure way of ensuring quality transformation process. Hence, the implication of this study is that installations of digital surveillance in the classrooms will enable principals to closely monitor both teachers' and students' behaviour; thereby maintaining quality assurance in the school system.

Another finding of this study revealed that the ways in which principals can use digital surveillance for quality assurance include: supervising the teaching-learning process in the classroom; monitoring students' behaviour in the class; guiding teachers on their pedagogical skills; detecting students that indulge in examination malpractice and ensuring that students learn in a safe learning environment. This is in consonance with Hornes (2006), who observed that the installation of CCTV in the classrooms enables principals to effectively supervise the teaching-learning process. The result of this study is also in line with Ashby (2017), who observed in his study that video or digital surveillance system is an investigative tool manager can adopt to monitor, supervise, and appraise the performance of their staff. The finding equally agrees with the studies of Jeannine (2013); Armitage (2002), who discovered that that application of digital

surveillance in the school system helped school managers to monitor students' behaviour, know the class that is not learning when it is supposed, to and know teachers who are either under-or over-utilized.

The finding from the test of the null hypotheses revealed that both male and female principals accepted that the application of digital surveillance significantly impacts on quality assurance in secondary schools in Rivers State, which implies that the installations of CCTV cameras in the classrooms will help to restore sanity, students' engagement, orderliness, discipline, high teachers' productivity, high students' academic achievement, among others.

5. Conclusion

From the findings of this study, it can be concluded that the application of digital surveillance in the classrooms will enable the school managers to effectively determine the quality of instructional delivery that teachers transmit to the students. It has been widely acknowledged that the application of digital surveillance system in private-owned organizations has helped the Management to ensure Total Quality Management (TQM), which satisfies their clients and customers. In this digital era, it will not be out of place if the education sector adopts digital surveillance into the school system to ensure quality and satisfy their customers as well. Hence, quality education is a reflection of quality school administrators.

6. Recommendations

Based on the findings of this study, the following recommendations were made:

- The government should revamp the education sector by installing digital surveillance in the classrooms and also ensure that there is adequate power supply to sustain the initiative.
- The Ministry of Education should also organize capacity building programmes to train principals on how to use CCTV cameras effectively in their schools.

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