

Reassessing School-Based Data and Management of Technological Innovations at the Secondary School level in Cross River State, Nigeria

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Abstract- This study is a reassessment of school-based data and the management of technological innovations and change in secondary schools in Cross River State, Nigeria. The emergence of technological innovation has turned the world into a global village and has transformed teaching and learning processes. In Cross River State, just like some other states in Nigeria, the basic challenge is that many schools still have constraints on the effective use of technology in the classroom, gathering and storage of data as well as management and administration of technological innovation and transformation. Management of technological innovations in the school system requires that the principals, who are the heads, coordinate both human and material resources effectively for the realization of technological innovation goal. From the result of findings, it was realized that “there is no significant positive relationship between school-based data and management of technological innovation”. It was recommended that Government of Cross River state and in fact Nigeria should as a matter of urgency make provision and distribution of facilities in schools that would aid the management and enhancement of technological innovations.

Index Terms - Reassessment, School-based Data, Management, Administration, Technology, Innovation.

INTRODUCTION

Technology integration into classroom instruction as well as the administration of the school system has gained much ground in both developed and developing countries. The concept of technology integration and innovation is now viewed as a fundamental part of successful teaching and has gained the interest of many researchers who investigated and explored effective ways of integrating technology into the school curriculum (Anderson and Maninger, 2007).

What constitutes school-based data is information generated internally in the school system. School-based data is used to determine progression through school. Their function is formative since they give direction to the goals of innovations and also shape the attitude and behaviours of members of the school community. There is global understanding that progress and technology go hand in hand. Advances in technological know-how have simplified man’s ability to cope with his environment. With the recent development in information and communication technology, the world has turned into a global village. Technological innovations involve the introduction of machines, equipment, and facilities (computers, projectors, internet among others) into the teaching learning environment. Management of technological innovations in the school system requires that the principal as the head of secondary school coordinate both human and material resources effectively for the realization of Information Communication Technology (ICT) goal (Osika and Essien, 2014). Information and communication technologies (ICT) are electronic technologies used for information storage and retrieval (Ndum and Okey, 2013). According to Ndum and Onukwugha (2013), in Africa, America, Europe and other parts of the world, school administrators are increasingly recognizing the benefits of using computer technology to increase their efficiency, to assist in the, to aid in delivering developmental efforts and to facilitate efficient and effective management and service delivery. Information and communication technology is a useful technological innovation which enhances and compliments teaching and learning in all subject areas. Improving the quality of education through the diversification of contents, methods, promoting

experimentation, innovation, infusion and sharing of information and best practices as well as policy dialogue are UNESCO's strategic objectives in Education (UNESCO, 2017). In Cross River State, many factors affect ICT's use and integration. Even at the secondary school level, teachers hardly come in contact with ICT aided instructional materials. Also most teachers do not have the needed experience and competence in the use of computers either for educational or industrial purposes. Furthermore, many teachers, the specifications in the National Policy on Education by the Federal Government of Nigeria notwithstanding, have been unable to find effective ways to use technology in their classrooms or any other aspect of their teaching and learning life. These factors have direct consequences on the state's educational development.

According to Ndum and Udoye (2020), the involvement of governments in school-based data and technological innovation is therefore twofold: supporting its expansion and safeguarding quality. In Cross River State, this role of government is farfetched. It is against this backdrop that this study sought to investigate the extent to which school-based data relate with the management and administration of technological innovation in public secondary schools in Cross River State.

THE PROBLEM IN CONTEXT

In Cross River State, just like some other states in Nigeria, many schools still have constraints on the effective use of technology in the classroom, gathering and storage of data as well as management and administration of technological innovation and transformation. Additionally, a digital divide exists between urban, semi-urban, and rural schools as a result of varied challenges the rural communities experience (Akanbi & Akanbi, 2012). Through a series of technology interventions for rural communities, many rural schools in Cross River state now have access to technology, but the usage is minimal due to other enormous challenges, such as lack of basic supportive infrastructures, inadequate computers, projectors, internet facilities, inexperienced and untrained personnel in the school system to operate these technological innovations. Levin and Wadmany (2008) noted that educators are yet to effectively integrate educational technologies

into K-12 classrooms. Identifying the barriers and challenges in rural schools may assist in providing holistic technology interventions that would be highly effective in the learning environment. Nigeria, being a developing country, faces the challenges of access to technology rich education. The Federal Ministry of Education (FME), Universal Service Provision Fund (USPF) and several private organizations have assisted many schools by providing various technology solutions, such as supplying personal computers, setting up computer laboratories and other facilities inclusive of Internet connection, as well as interactive whiteboards (IWBs) and projectors (SchoolNet, 2005,). However, there have been no means in place to ascertain the impact of technologies on student achievement, especially in rural schools in Nigeria that also faced the lack of electricity, adequate funding, and basic infrastructures, among other challenges. Many research studies on technology integration into classroom instruction have shown that there can be a significant, positive impact on student, hence, this study.

CONCEPTUALIZING SCHOOL-BASED DATA

The need for school-based data engendered through Information and Communication Technology (ICT) in Nigerian school system cannot be overemphasized. In this technology-driven age, everyone requires ICT competence to survive (Ndum and Anam, 2013).

Data is a collection of information in form of ideas and particulars about objects, persons or events. Many procedures are utilized for the collection of the needed information about school which may be presented in numerical or verbal form (Ekuri, 2018). Ekuri further maintained that three categories of data are useful for school improvement: data that determine the current standard of students' conditions to students learning such as: staff absences, enrolment, professional development and status of school plant; and data on factors that impact directly on students' achievement such as: students' attendance, staff opinion of students' progress, parents'/students' opinion of teaching quality and school environment, time allocated to key learning areas, students' dropout rate, transition rate and teacher-student ratio.

In a study carried out by Ibiwoye, in Osika and Essien (2014) on the learning environment in the Zaria Local Government Education Authority Schools, the

following problems were identified: i) a wide range of class size, ii) lack of teaching aids, iii) acute shortage of furniture, iv) poor visual learning environment as a result of constant closure of windows to keep off strong winds, and v) poor condition of buildings. In a similar study conducted by Olaofe in Osika and Essien (2014) twenty years after reported, the situation had even grown worse. Olaofe painted a very grim picture of the current situation in public schools when he asserted that all the primary schools in his study were typical public schools and were deficient in basic infrastructural facilities that make learning environment conducive. They included access roads, buildings, classrooms, furniture, and toilets among others. Many classrooms had no doors and ceiling. Children sat on the floor to take lessons and teachers had no tables or chairs. The Nigerian public schools were referred to as “a breeding ground for illiteracy” It is obvious that no educational system can afford to stay outside the technological age in the current digital world.

According to a study conducted by Okebukola (2015), a comparison of the variables of teaching methods with ability grouping, cooperative learning and enhancement strategy found that poor performance in Science, Technology and Mathematics is as a result of poor classroom teaching, including course evaluation, as well as students attitude to school. Without reliable and valid data, schools have a problem of identifying and solving the problems of poor management of innovations.

MANAGEMENT OF TECHNOLOGICAL INNOVATIONS IN SECONDARY SCHOOLS IN CROSS RIVER STATE

Management of technological innovations in the school system requires that the principal coordinates both human and material resources effectively for the realization of ICT goal.

Management is viewed as a process designed to ensure the cooperation, participation, intervention, and involvement in effective achievement of goals. Essien, Uko, Edet, Ekpiken (2008) investigated access and dichotomy between male and female students' enrolment in secondary schools in Nigeria. They also investigated the students' academic performance in the core subjects in the West African Senior Secondary School Certificate Examination. Expost

facto design was adopted and data obtained from Federal, Ministry of Education and West African Examination Council showed students' results for three consecutive years. The study' found, among others, low enrolment in secondary schools, insignificant gender imbalance in enrolment and poor performance in core science subjects. Like many countries in the world, the education system in Cross River State in particular and Nigeria in general places strong emphasis on Science Technology and Mathematics Education. This is in response to the rapid advancement in science and technology so that the country will be able to key into the process of digitization like other countries of the world. The quality of education itself depends upon the availability of reliable data, adequacy of resources allocated to education and effective management of these resources.

Gaziel (2017) examined the effect of the school principals' instructional behaviour on students' achievement in secondary schools. The research sample included 256 teachers from 32 secondary schools in Israel. Data collected on school features included: school size, average class size, teacher education and experience. These variables were regressed on school students' achievement in matriculation examination results. The result indicated that 49% of the variance in students' achievement was explained by the variables: students' socio-economic status, class size and. principal leadership behaviour. Education is important to national growth and development because the future of any nation depends quite considerably on the quality of education it provides for its citizenry. The nature of school-based data available to the principal as presented in the above study enables him to know the required technological equipment and facilities needed for effective learning to take place.

Those having to implement the educational changes taking place are the teachers within the public education system who have to adopt new ideologies and implement them in their teaching, since it is the teachers who are responsible for passing on the changes through their teaching to their students (i.e. the future citizens the governments are concerned to educate). The teachers can ensure transformation through school-based data and technological innovation (Ndum and Okey, 2015).

Educational leaders are being presented with several models for improving the effectiveness of classroom instruction and increasing students' achievement that advocate for better use of data to guide decisions about instruction. School wide models for instructional improvement such as those advocated by Murzano (2013) had several common themes or components to their model. Their findings revealed: school wide improvement design that involved administrators, teachers, including time scheduled for staff to work together and time for teacher development of content knowledge and subject specific pedagogy. Structured activities for training staff to analyse data on students' performance and data on the educational environment that explains differences and disaggregated data to identify learning problems and gaps between expected and actual performance and frequent use of data as a formative evaluation tool to guide instructional decisions and plans. These data provide opportunities for the principal to adequately manage technological innovations. This means that the absence of these data posed a serious management problem to the principal. Porter, Blaine, Smithson and Osthoff (2005) designed to test the data enacted curriculum instructional improvement model involving Mathematics and Science teachers in 50 middle schools located in five urban districts in the United States of America. The sample was made up of 604 Mathematics and Science teachers who were assigned to treatment and control groups. Result showed that data enacted curriculum model had effect on improving instruction for teachers in treatment schools when compared with teachers that did not experience the data enacted curriculum professional development approach. The key feature of the model is the capacity to analyse gaps and weaknesses of instruction in relation to standards, assessments, improvement of innovation goals and to make informed decisions about the content areas of instruction that should be strengthened to improve students learning. The model uses data on instructional practices and enacted curriculum taught in the classroom to offer educators an additional rich source of information to formative evaluation data and direct feedback to teachers.

Emetaron (2014) declared that data from schools and classroom observations during the Situation and Policy Analysis Survey conducted in 1991-1992 in Nigerian primary schools showed that the management of the general environment in Nigerian

primary schools did not promote quality teaching and learning. Eighty-seven per cent of the Nigerian primary schools sampled were overfilled with pupils crowding on the few available long benches. Seventy-seven per cent of the schools had no potable water and 68% of schools had no toilets. Three per cent of the schools had no chalkboards, 20% of the pupils sat on the floor, 47% of the primary schools lacked furniture for pupils, 77% of pupils were without textbooks, 36% were without writing materials. Based on the literature review, it is obvious that most- of the studies have been subjected to longitudinal effect and so this study provides current literature on school based-data and management of technological innovations in public secondary schools in Cross River State. Besides, the increased sample of 2010 principals and 825 teachers as well as the instrument used for data collection serve as another significance of this study.

However, according to Ndum and Okey (2013), there is universal recognition of the need to use school-based data through Information and Communication Technology (ICT) in education as we enter the era of globalization where the free flow of information via satellite and the internet hold sway in global information dissemination of knowledge. Already, Nigeria is on the wrong side of the international digital divide, as it has not made significant effort to totally integrate ICT into secondary school curriculum. ICTs have become key tools and have, a revolutionary impact on how we see the world and how we live in it. ICT is having a revolutionary impact on educational methodology globally.

CONCLUSION

The findings of this study have shown that there is no significant relationship between school-based data and management of technological innovations in secondary schools in Cross River State. The finding is in consonance with Ndum and Udoe (2020), indicating that in Cross River State, the role of government in strengthening and enhancing school-based data is farfetched, and as such insignificant. This finding is rather unfortunate considering the importance of technological innovations in the development of educational system in the state. Therefore, the findings indicate that the necessary technological equipment and facilities such as computers, projectors and other ICT accessories are

grossly inadequate in secondary schools in the state. This is why the necessary data cannot even be generated within the school system let alone storing them for retrieval when necessary. It is also observed with dismay that even if the ICT facilities were available, the required manpower is not available to operate the machines. This is why there is high rate of computer illiteracy among the teachers and students in the school system. Therefore, the principals cannot use school-based data to manage technological innovations. This calls for a lot of concern and timely intervention by stakeholders.

Policy Recommendations

1. Government of Cross River state and in fact Nigeria should as a matter of urgency make provision and distribution of facilities in schools that would aid the management and enhancement of technological innovations.
2. Stakeholders at all levels should create intensive and aggressive awareness on the need for to embrace ICT education in the secondary school system, in order to ensure compliance with the global trend of technological transformation.

REFERENCES

[1] Akanbi, B. E. & Akanbi, C.O. (2012). Bridging the digital divide and the impact on poverty in Nigeria. *Journal of Computing, Information Systems & Development Informatics*, 3(4), 81-87.

[2] Anderson, S., & Maninger, R. (2007). Preservice teachers' abilities, beliefs, and intentions regarding technology integration. *Journal of Educational Computing Research*, 37(2), 151-172.

[3] Ekuri, E. E., (2008). School based data and quality assurance in school supervision. A paper presented at a training workshop for school inspectors in Cross River State. June, 2nd -3rd .

[4] Emetarom, U. G., (2014). Provision and Management of Primary Schools in Nigeria: Implications for Policy Formulation. In E. O. Fagbame, J. B. Babalola, M. fabunmi & A. O. Ayeni (Ed). *Managing primary education in Nigeria*. Benin City: NAEAP.

[5] Essien, M. I., Uko, E. S., Edet, A. & Ekpekin, W., (2005). Secondary school enrolment, gender disparity and academic performance in science

subjects in secondary schools in Nigeria: Implication for Sustainable Development. Benin City: NAEAP

[6] Eziuzo, G. O., (2009). Allocation of Science, Technology and Mathematics educational resources in junior secondary schools in Anambra state. *Journal of Educational Administration and Planning* 9(2) 81-91.

[7] Gazi, H. H. (2017). Re-examining the Relationship Between Principal Instructional Leadership and student Achievement. *Journal of Social Science*. 15, (1),17-24.

[8] Levin, T. & Wadmany, R. (2008). Teachers' views on factors affecting effective integration of information technology in the classroom: Developmental scenery. *Journal of Technology and Teacher Education*, 16(2), 233-263.

[9] Murzano, R. J. (2013). *What Works in School: Translating Research into Action*. Alexandria: Association for Supervision and Curriculum Development.

[10] Ndum, V. E. & Anam, B. E. (2013). Addressing the Problems Militating against Effective Integration of Information and Communication Technology (ICT) in the Nigerian University System. *Journal of Assertiveness*. Available: <http://www.globalacademicgroup.com/journals/assertiveness/ADDRESSING%20THE%20PROBLEMS.pdf>. Retrieved: 30/05/2020.

[11] Ndum, V. E. & Okey, S. M. (2013). Information and Communication Technology and the Enhancement of Quality and Accessible Secondary Education in Nigeria. *Journal of Qualitative Education*, 9 (3), 1-7 Available: <http://www.globalacademicgroup.com/journals/teacher%20perspective/ADDRESSING%20THE%20PROBLEMS%20MILITATING%20AGAINST%20THE%20EFFICIENT%20MAN.pdf>. Retrieved: 30/05/2020.

[12] Ndum, V. E. & Okey, S. M. (2015). Teachers' Involvement and Role in Climate Change Curriculum Development and Implementation in Nigerian Secondary Educational System. *Management Science & Engineering*, 3(1),21-31. www.scholink.org/ojs/index.php/mmse

[13] Ndum, V. E. & Udoye, R. N. (2020). Role of Government in the Internationalization of

Tertiary Education in Nigeria. *Iconic Research and Engineering Journals*, 3(9) 94-99.

- [14] Ndum, V.E. & Onukwugha, C. G. (2013). Overview Of Policy And Practice Of Guidance And Counseling In Nigeria And The United States Of America (Usa): Role Of Computer Technology. *International Journal of Humanities and Social Science Invention*, 2(4),42-50
- [15] Okebukola, P. A. (2015). The race against obsolesce: Enhancing the relevance of Benin. National Workshop on Examination Malpractice. In C. Maduka (Ed.). *Examination malpractice: causes, implications and remedies*. Benin Ambik Press.
- [16] Osika, E. O. & Essien, M. I. (2014). School-based data and management of technological innovations in public secondary schools in Cross River State. *Global Journal of Educational Research*. 13(2), 20-31.
- [17] Porter, A. C., Blame, R. K., Smithson, J & Osthoff, E. (2005). Place- based Randomizing Trials to test the Effects on Instructional Practices of mathematics/Science Protasted Development for Teacher. *The Analysis of the American Academy of Practical and Social Science*. 599, (1): 147-175.
- [18] SchoolNet. (2003). ETF DigiNet. Retrieved from <http://www.schoolnetng.net/projects/etf>
- [19] UNESCO (2017). *Information and Communication Technology in Teacher Education: A planning Guide*. Paris: UNESCO.