An Assessment of School variables as Determinants of Principal' Application of ICT in Secondary School Administration in Akwa Ibom State

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ABSTRACT

*The study sought to assess school variables as determinants of principal' application of ICT in Secondary School administration in Akwa Ibom State. The research design used for this study was a descriptive survey research design. The research area for this study was in Akwa Ibom State. The population of this study comprised sixty (60) principals from (130) Secondary Schools in Akwa Ibom State. Simple random sampling technique was used to select 50 respondents as the sample size. The main instrument used in this study was a Questionnaire titled "*Principal' Application of ICT in Secondary School Administration Questionnaire *(PPISSVAQ). Cronbach Alpha statistics used to determine the reliability of the instrument. The statistical technique used for both the research questions and Null hypotheses was simple linear regression at 0.05 alpha levels. Findings from the study, revealed no significant relationship between massification of students' intake and effectiveness of school supervision, supply of school facilities and managing of school budgets. All the null hypotheses were retained. The study thus concludes that there was no such difference. In terms of ICT application and academic achievement, with the exception of 10th grade math scores, students in larger classes performed the same or better than students in smaller classes. Based on this, it was recommended that administrators and all heads of schools should not panic whenever there is influx of students in their school enrolment. State Secondary Education Board should have some sort of incentives to use and encourage principals who manage their schools without much demand on the government for their ingenuity.*

KEYWORDS: School Variables, ICT, Administration, Principal Application

INTRODUCTION

The school is an open system that is in constant interaction with the environment. It receives inputs from the external environment in the form of human and material resources, processes them and emptied them into the environment. These make the administrative functions of the principal really complex and tasking. The functions of the principal's administrative effectiveness include decision making, planning, communication, influencing, coordinating and

evaluation (Mbipom, 2000). According to Selwood (2005), these functions (decision making, planning, communication, influencing, coordinating and evaluation) are applied in the areas of curriculum development, instructional supervision, staff and student personal administration, guidance, finance, community relation construction and maintenance of facilities and special services. There is no doubt, therefore, that secondary education in Nigeria has become more complex over the years with concomitant management demands being exerted on the principal especially in today's Information and Communication Technology (ICT) era (Okon, Ekaette and Ameh, 2015). The enormous rise in the number of student in schools as well as the multiplicity of subject/curriculum diversification coupled with the complexity of administering a given secondary school, it has made an imperative for school principals to handle large volume data which they must process speedily to provide information to the ministry of education, the school Broads, the teaching and learning personnel within the school as well as the general public (Asiabaka, 2010).

Information and communication Technology (ICT) refers to all the technology used to handle telecommunication, broadcast media, intelligent building management system, audiovisual processing and transmission system, and network-based control and monitoring functions. It is a powerful instrument which enables practical environment and assist new ways of teaching and learning. ICT is also a set of resources required to manipulate information, especially computer, software and networking necessary to turn, stock, direct, transmit and recapture information. In order for successful implementation of ICT application in administration, Macneil and Delafield (2008) commented that principals need to use the existing resources wisely and creativity. They ought to "think outside the box" and they must be in a fluid environment, in addition, they need to establish a vision for the school, a context for technology in the school to empower teachers and help student become more technology literate (Brockmeier, Sermon and Hope, 2015).

STATEMENT OF THE PROBLEM

It is often believed that school principals are on the frontline of the battle to create an enabling environment for quality education at the secondary school level. However, some school administrators (principals precisely) in Uyo Senatorial District of Akwa Ibom State Nigeria I particular, work under difficult conditions and are often not well prepared for the tasks they must undertake routinely. There appear to be an increase in school population, complex curriculum, decline in resources and new administrative task within the public secondary school in the area of the study. This appears to be made difficult by several constrains which include lack of funds to purchase and sustain ICT infrastructure and equipment, the inability of secondary school administrators to keep up with the pace of development in ICT, the lack of the staff with appropriate skills to manage ICT both at the strategic and operational levels, epileptic electricity supply or complete absence of it in schools, school location, size and type among others. The study therefore sought to assess the extent that principal and school variables influence the application of ICT in Secondary School administration in Akwa Ibom State.

OBJECTIVES OF THE STUDY

i. Establish the difference in principal' application of ICT in Secondary School administration based on school size.

ii. Ascertain the difference in principals' application of ICT in Secondary School administration based on school type (single sex and co-educational).

RESEARCH QUESTIONS

i. What is the difference in principals' application of ICT in Secondary School administration based on school size?
ii. What is the difference in principals' application of ICT in Secondary School administration based on school type?

Hypotheses

i. There is no significant difference in principals' application of ICT in Secondary School administration based on school size.
ii. There is no significant difference in principals' application of ICT in Secondary School administration based on school type.

LITERATURE REVIEW

School Size and Principals' Application of ICT on Secondary School Administration

Concerns about school size in the educational research literature tend to center on all school levels. The most common concern expressed is that school are too large, and that they are getting larger. school size refers to the number of student in a given programme or school, specifically larger. School size refers to the number of student being taught by individual teacher in a programme or school. The average number of student being taught by teachers in a school, district, or education system. The term may also extend to the number of student participating in learning experiences that may not take place in a traditional classroom setting, or it may also refer to the total number of student in a particular grade level or class in a school (although this usage is less common in public education).

It should be noted that schools, district, state and federal education agencies commonly expressed school size as a ratio of student to teachers, a "student-teacher ratio". School size can appropriately be determined by the number in a class. Class size refers to the students a teacher faces during a given period of instruction. Class size is an administrative measure typically defined as the number for whom a teacher is primarily responsible during a school year (Lewit and Baker, 2009). As public schools and school systems have ventured to expand over the previous century, the debate on school size and its relationship to organizational performance has ensued (Leithwood and Jantzi, 2007). Experts have often disagreed on an accepted optimal size for schools, however, most have accepted the existence of a link between organizational size for schools (Jones, 2003; Lee and Smith, 1997). While the existence of this link has been successfully established, the extent to which school size affect organizational effectiveness has frequently been unclear.

Research conducted by Lee and Smith suggested that the ideal secondary school size was between 600 and 900 students. Dissenting views concluded that secondary school should only have between 400 and 500 students in order to optimize effectiveness (Shepherd, 2004). Although the research has ultimately been inconclusive, the body of the work was established as

a means by which generalities can be made regarding school size (Leithwood and Jantzi, 2007; Shepherd, 2004). Aspect of organizational effectiveness can now be predicted about schools considered to be both large and small. Advocates of both large and small school continue to debate the issues while citing communities that have been benefited from consolidation and those that have suffered as a result of losing a local high school (Jones, 2003, Shepherd, 2004).

The guiding research question for the study with regards to application of ICT and academic was, what was the relationship between the size of the student population in rural secondary schools of South George and application of ICT, academic achievement as measures by the mathematical portion of the George High School Graduation Test while controlling for socio-economic status? The major findings in this study that regards to application of ICT as an academic achievement were: (1) student in large and medium schools produce significantly higher application of ICT and academic achievement result when compared with small school; and (2) controlling for wealth in the examined schools narrows the gap in application of ICT and academic achievement between the student in large schools and medium schools and the small schools. Improving application of ICT and academic achievement has continued to be one of the most important goals of educators and school administrators for some time, theorists have debated whether or not reducing school enrolments in high schools could improve academic achievement and the resulting research has continued to produce conflicting results (Shear, 2008; Werblow and Duesbery, 2009). The findings from this study with regard to application of ICT and academic achievement seemed to continue to confound the literature with the exception of the ability of wealth to narrow the achievement gap between large and small schools.

Although most research results regarding school size, application of ICT and academic achievement have continued to contradict themselves, most researchers have supported the proposition that the effect of school size on application of ICT and academic achievement was limited when per pupil expenditures and school wealth remained constant (Shear, 2008; Werblow and Duesbery, 2009). Most research demonstrated a curvilinear relationship between school size, application of ICT and academic achievement with extremely large schools and extremely small schools performing poorer on standardized assessment than school that fell within the middle 60% (Werblow and Duesbery, 2009). In the current study, a curvilinear relationship between ICT usage, academic achievement and school size was not noted as student achievement was reported to be higher in schools with larger enrollments. However, as all schools examined produced academic achievement means with limited variability, it can be said that this lack of variability between scores limited the ability of the study to produce corroborating results with prior research. Howley (2001), in his continuing study of the relationship to school size to student outcomes, has concluded that one size may well not fit all. Howley (2001) research suggested that children from economically disadvantaged backgrounds perform better academically when served by small schools. However, student from affluent backgrounds tend to perform better when housed in larger settings. Finally, another intriguing possibility raised in the research on school size is that neither bigger or smaller is better, but, instead, and actual ideal size exists between the two.

Lee and Smith (1997) analyzed the relationship between high school size and student learning. They used longitudinal data or nearly 10,000 students in approximately 800 high schools. The researchers concluded that analysis of the data supported the conclusion that students performed best in schools ranging in size from 600 to 900. Adeyemi (2008) examined the influence of

school-size on the quality of output in secondary schools in Ekiti State, Nigeria. The population of the study comprised all the 141 secondary schools that presented students for the year 2003 SSC examinations in the State. A sample of 120 schools was selected through stratified random sampling technique. Data were collected through an inventory and were analysed with the use of chi square test, correlation analysis and t-test. Semi-structured interview was conducted with selected principals and education officers. Their responses were analysed through the content analysis technique. The findings revealed that schools having an average class-size of 35 and below obtained better results in the Senior Secondary Certificate (SSC) examinations than schools having more than 35 students per class. The main scores were higher in schools having an average class-size of 35 and below. The interviewees' responses supported the findings as they supported small class-sizes in schools as well as effective ICT application. It was therefore recommended that Government should provide more classrooms in all secondary schools in the State to cater for small class-sizes.

Single Sex/Co-educational and Principals' Application of ICT in Secondary School Administration.

Single-sex education also known as single-gender education, is the practice of conducting education where male and female student attend separate classes or in separate building or schools. Some educational researchers have identified single-sex education as a way to facilitate the educational experience for all student. Single sex education refers to the education of student in an environment that consist of a single gender, either all-male or all-female environments (NASSPE, 2010). This single-sex environment that consist of a single either males or female within a coeducational school setting, or a single-sex school. Within any educational framework there are physical framework there are physical, socio, emotional and intellectual variables that impact learning. Single sex education may provide each sex with environment that enhances gender related learning variables for each sex specifically. There is much commentary on the educational outcome related to the type of institutions girls have access to; that is single sex schools and coeducational schools (Meyer, 2008: Riordan, 2008).

According to Booth and Nolan (2009) girls' environment plays an important role in explaining why she chooses not to compete. Girls from single sex school behave more competitively than do girls in coeducational schools. A study by (Malcove, 2007) found out that females frequently expressed having more confidence in the single-gender setting. This study also found that girls to continue to oral discussion and to ask question without being ridiculed in a single gender setting. Equally Eisenkopf, Hessami, Fischbacher and Ursprung (2013) analysis the impact of female-only classes on mathematics achievement exploiting random assignment of girls into single-sex and coeducational classes in Switzerland secondary schools. They found out that single sex classes improve the performance of female student in mathematics. In a study by Kessels and Hannover (2008) they found out that principals from single-sex apply ICT in secondary school administration than principals from coeducational classes. Single sex schooling was found to help adolescent to gain a better self-concept of ability in school subject that are considered inappropriate for their own sex. A study by NASSPE (2010) found out that principals heading single sex schools produce higher tertiary entrance score than those in coeducational schools due to adequate administration.

Proponents of single-sex schools argue that these schools allow girls to flourish in a way that coeducational schools may not. Some studies that girls in schools with single-sex program achieve higher learning, display more self-confidence and leadership skills, and enter male-dominated field at a higher rate (Ferrar, 2005: Smyth, 2010). These Studies have also shown that girls in single-sex classes are actually more likely to act outside of traditional gender roles. Boys might also feel freer to engage in pursuits they may not have considered at a coeducational school. When girls are around, they are the ones expected to take part in such non-macho pursuits. But when the girls are not in the school, boy may perceive that it is acceptable to fill those feminine roles.

Single-sex schools would therefore allow some boys to transcend the gender roles that are typically assigned to them. Single sex school have a higher percentage of graduate who are attended four years' in colleges and a lower percentage of graduates who attended two-year junior colleges than coeducational schools. The positive effect of single-sex school remains substantial, even after taking into account various school-level variables such as teacher quality, the student teacher ratio, the proportion of student variables such as teacher quality, the student ratio, the proportion of student receiving lunch support, and whether the school are public or private (Park, Behrman and Choi, 2012). Although the disparity between the enrolment of girls and boys in primary school has narrowed since 1960s the number of girls who enrolled in higher education institutions continues to lag behind that of boys.

One justification for single-sex education stems from the notion that boys and girls learn in different ways either due to different socialization or biological differences so that single-sex school allows teachers to tailor instruction to the particular needs of each sex. Another justification is that the presence of the opposite sex is distracting and leads to lower academic engagement (Riodian, 1990). This is thought to be particularly important in girls because larger shares of boys within coed classroom have been found to be associated with lower classroom achievement (Lavy and Schlosser, 2009 and Hoxby, 2000). It is also argued that single-sex schooling increases the likelihood that boys/girls participate in traditionally female/male subject either due to the salience of gender identities in coed settings (Jackson, 2009) or by deemphasizing differences in the timing of neurological development between boys and girls (Spielhofer, Tom and Sandie, 2004; James and Richards, 2003).

Eisenkopf, Fischbacher and Ursprung (2013) carried out a study on the effect of random assignment to coeducational and single-sex classes on the application of ICT in secondary school administration by principals. Our estimation result shows that single-sex schooling improves the performance by principals who applies ICT in secondary school administration. This positive effect increases if the single-sex school is headed by a male teacher. An accompanying survey reveals that single-sex school strengthen female students' self-confidence and renders the self-assessment of their ICT skills more level-headed. Single-sex schooling thus profound implications for human capital formation and the mind-set of female principals.

Pahlke, Hyde and Carlie (2004) conducted a study on the effect of single-sex compared with coeducational schooling on principals' performance and attitude: A meta-analysis. The proponent of single sex (SS) education believed that separating boys and girls, by classrooms or schools, increase students' achievement and academic interest. In this article, mete-analysis was used to analyses studies that have tested the effect on students of SS compared with

coeducational (CE) schooling. We meta-analyzed data from 184 studies, representing the testing of 1.6 million students in Grades K-12 from 21 nations, for multiple outcomes (e.g. mathematics performance, mathematics attitude, science performance, educational aspirations, self-concept, gender stereotyping). To address concerns about the quality of research designs, we categorized studies as uncontrolled (no control for selection effects). Based on mixed-effect analyse, uncontrolled studies showed some modest advantages for single sex schooling, for both girls and boys, for outcomes such as mathematics performance but not for science performance. Controlled studies, however, showed only trivial differences between students in SS versus CE, for mathematics performance (g 0.10 for girls, 0.06 for boys) and science performance (g 0.06 for girls, 0.04 for boys), and in some cases showed small differences favoring CE schooling (e.g, for girls' educational aspirations, g 0.26). Separate analyses of U.S. studies yielded similar findings (e.g. for mathematics performance g 0.14 for girls and 0.14 for boys). Result from the highest quality studies, then, do not support the view that SS schooling provides benefit compared with CE schooling. Claims that SS schooling is particularly effective for ethnic minority boys could not be tested due to lack of controlled studies on this question. The difference in mathematics performance was made possible as a result of principals' performance and attitudes to administration.

METHOD

Research Design

An Expost-Facto design was used for this study

Area of the Study

The research area for this study was conducted in Akwa Ibom State.

Population of the Study

The population of this study comprised of 213 Principals and 629 Vice- Principals in Public Secondary Schools in Akwa Ibom State during 2017/2018 academic session.

Sample and Sampling Techniques

A stratified random sampling technique was used to draw the sample of 535 secondary school administrators comprising 123 principals and 412 vice principal for the 2017/2018 school session was chosen to participate in the study.

Instrumentation

The Main Instrument used in this study was questionnaire titled "Principal' Application of ICT in Secondary School Administration Questionnaire (PPISSVAQ)".

Validation of the Instrument

The face validation of the instrument was carried out using expert in test and measurement.

Reliability of the Instrument:

In order to establish the reliability of the instrument, internal consistency reliability coefficient was used. Crombach Alpha technique was used to determine the level of reliability of the instrument used in the study with a reliability coefficient of 0.81.

Method of Data Analysis

Independent t-test was used in testing the hypotheses formulated for the study at .05 level of significance.

RESULT AND DISCUSSION

Hypothesis One

The null hypothesis states that there is no significant difference in principals' application of ICT in Secondary School administration based on school size. In order to test the hypothesis, independent t-test analysis was used to analyze the data. (See table 1).

TABLE 1: Independent t-test analysis of the difference in principals' application of ICT in Secondary School administration based on school size

Variable	N	$\overline{X}$	SD	t
Small	297	15.00	1.68	
				32.83*
Large	238	11.13	0.78	

***Significant at 0.05 level; df = 532; N= 535; critical t-value 1.960**

Table 1 presents the obtained t-test-value as 32.83. This value was tested for significance by comparing it with the critical t-value (1.960) at 0.05 level with 532 degree of freedom. The obtained t-value (32.83) was greater than the critical t-value (1.960). Hence, the result was significant. The result means that there is significant difference in principals' application of ICT in Secondary School administration based on school size.

Hypothesis Two

The null hypothesis states that there is no significant difference in principals' application of ICT in Secondary School administration based on school type. In order to test the hypothesis, independent t-test analysis was used to analyze the data. (See table 2).

TABLE 2: Independent t-test analysis of the difference in principals' application of ICT in Secondary School administration based on school type

Variable	N	$\overline{X}$	SD	t
Single (Boys/Girls)	327	14.72	1.82	
				27.98*
Mixed	208	11.00	0.75	

***Significant at 0.05 level; df = 532; N= 535; critical t-value 1.960**

Table 2 presents the obtained t-test-value as 27.98. This value was tested for significance by comparing it with the critical t-value (1.960) at 0.05 level with 532 degree of freedom. The obtained t-value (27.98) was greater than the critical t-value (1.960). Hence, the result was significant. The result means that there is significant difference in principals' application of ICT in Secondary School administration based on school type.

DISCUSSION OF THE FINDINGS

The result of the data analysis in table 1 was significant due to the fact that the obtained t-value (32.83) was greater than the critical t-value (1.960) at 0.05 level with 532 degree of freedom. The result implies that there is significant difference in principals' application of ICT in Secondary School administration based on school size. The result was in agreement with the research

finding of Howley (2001), who averred in a study of the relationship of school size to student outcomes, children from economically disadvantaged backgrounds perform better academically when served by small schools. However, student from affluent backgrounds tend to perform better when housed in larger settings. Finally, another intriguing possibility raised on school size is that neither bigger or smaller is better, but, instead, and actual ideal size exists between the two. The significance of the result caused the null hypotheses to be rejected while the alternative one was accepted.

The result of the data analysis in table 2 was significant due to the fact that the obtained t-value (27.98) was greater than the critical t-value (1.960) at 0.05 level with 532 degree of freedom. The result implies that there is significant difference in principals' application of ICT in Secondary School administration based on school type. The result was in agreement with the research finding of Riodian, (1990), who asserted that single-sex education stems from the notion that boys and girls learn in different ways either due to different socialization or biological differences so that single-sex school allows teachers to tailor instruction to the particular needs of each sex. Another justification is that the presence of the opposite sex is distracting and leads to lower academic engagement. This is thought to be particularly important in girls because larger shares of boys within coed classroom have been found to be associated with lower classroom achievement. The significance of the result caused the null hypotheses to be rejected while the alternative one was accepted.

CONCLUSION

This study concludes that there was no such difference. In terms of ICT application and academic achievement, with the exception of 10^{th} grade math scores, students in larger classes performed the same or better than students in smaller classes. Students in larger classes had slightly higher graduation rates, and a larger proportion planned to attend two or four year colleges. An accompanying survey reveals that single-sex school strengthens female students' self-confidence and renders the self-assessment of their ICT skills more level-headed. Single-sex schooling thus profound implications for human capital formation and the mind-set of female principals. Therefore, it was concluded that there is significant difference in principals' application of ICT in Secondary School administration based on school size. Also, there is significant difference in principals' application of ICT in Secondary School administration based on school type.

RECOMMENDATION

The study therefore recommended that

1. State Secondary Education Board should have some sort of incentives to use and encourage principals who manage their schools without much demand on the government for their ingenuity
2. Policy makers and government should ensure that more classrooms are built and number of students in a class should not be greater than thirty.
3. Government should provide more classrooms in all secondary schools in the State to cater for small class-sizes.

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