

# **Pervasiveness of data driven decision making in Kenyan Public Secondary schools: Case of Nairobi County**

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## **Abstract**

The major goal of every learning institution is deliver good quality education to its students just like every other organization aims to offer better quality products to it's customers to gain a competitive advantage. Secondary schools are critical to ensuring quality education in every economy as they interact with students in their early stages of education; giving them a critical say in molding future career choices of these students. The rise in the use of ICTs and in particular areas of data gathering and analysis has presented a unique opportunity for schools to analyze this data about their students, school environment and class interaction with the aim of molding students and equipping them with skills in relation to their strengths; understanding the weaknesses of the students and responding appropriately through informed decisions. While this trend of data driven decision making has gained momentum in developed countries, Africa and other developing countries, unless in the case of selected private schools, seem not to have seen the need to transition to data driven decision making in enhancing their quality of education. This paper considers the views and perceptions of data driven decision making in secondary schools in Kenya. The research was conducted using a structured questionnaire amongst senior management of public secondary schools in Nairobi County. Data analysis was done using SPSS 17.1. Descriptive and inferential statistics was used to analyze the data

and to draw conclusions. The results show that few public secondary schools have transitioned to computer data driven decision making in Kenya.

**Keywords:** school management, data-driven decision making, ICT, data mining, data analytics.

## **Introduction**

The main goal of every school is to provide quality education. For this to be achieved there is need for accurate data to be collected, analyzed, stored, and utilized in decision making. This is so because schools are complex organizations often serving larger numbers of students and have a variety of departments, academic programmes, and co-curricular activities all of which must be administered effectively using data (Ndiku, Oyoo, & Owano, 2014). This is complicated by the fact that schools are not businesses and students are not adults. Schools are far more complicated institutions, socially and politically. Urban schools, particularly those serving highly diverse populations, harbor many conflicting cultures, each of which affects student learning in different ways e.g., whether students are dependent or independent learners, whether they see scholars as role models, whether they think boldly or enjoy debate or disagreement (Brown, 2004).

The aim of each and all of these ingredients is to create an environment conducive to learning. Such environments are easily recognized: everyone is clearly learning; everyone expects to learn and expects everyone else to learn; classrooms and school halls contain numerous examples of high quality student work and achievement; there are multiple opportunities to learn in multiple ways, depending on how a person learns and at what pace; each student has productive relationships with many other students and with many teachers and adults in the community; great learners are celebrated and modeled; people work together on interesting projects in small and large groups; the school is abuzz with conversations about interesting and important matters; a language of inquiry and thoughtfulness tends to dominate; people listen to one another; everyone feels safe enough and free enough to take risks, to be wrong, to make mistakes, or to try something new; widespread trust is evident; strangers are welcomed; diversity is capitalized on as a strength; and it just feels good to be there. With so many meaningful interactions taking place within school environments, so many opportunities are created where data regarding students can be gathered to help make more informed decisions.

## **What is Data Driven Decision Making?**

Data driven strategic decision making is about collecting appropriate data, analyzing that data in a meaningful fashion, getting the data into the hands of the people who need it, using the data to increase efficiencies and improve performance and communicating data-driven decisions to key stakeholders. Due to the dynamics in strategy management, data-driven decision making has become a central focus of forward looking organizations policies and practice. An approach is to consider the Mulcaster's Managing Forces framework which addresses this issue by identifying 11 forces that should be incorporated into the processes of decision making and strategic implementation. The 11 forces are time, opposing forces, politics; perception, holistic effects, adding value; incentives, learning capabilities, opportunity cost, risk and style (Masha, 2014).

Managers in such type of organizations are embracing commercial and home-grown data-driven decision making tools and support systems to help track and drive improvement and performance. The challenges facing implementation of many strategic data driven decision practices are technical, resources, financial and data quality.

As regards education, Student data management in schools seems to be ignored by educational planners in developing countries and needs to be addressed if effective planning is to be attained and the goal of quality education realized (Ndiku et al., 2014).

## **Schools and data driven decision making**

The relevance of reliance on statistical data in school management has been greatly undermined especially in developing countries and in particular Africa. This, (Omoso, 2012) argues that it has been contributed by poor record keeping in learning institutions. They further argue that the fact that Governments heavily invest in education but spend little to monitor and evaluate the investments made has worsened the situation.

According to UNESCO (2010), Schools have made little effort to monitor and evaluate their activities and thus, they can no longer operate with minimum data about their environment if they are to closely monitor the inputs, process, and output in the interest of institutional development and survival. This

has been made even more difficult by the increasing enrollment without extra government support hence schools cannot make better investments without relevant data. In an effort to address the needs of an ever increasing diverse student population, school leaders are compelled to have enough information at hand to know where problems exist and how to best solve them (Rogers, 2011).

In an attempt to distinguish between data and decision making, Lee (2011) argues that data is useable only after analysis; interpretation and then action can be taken based on the data. This corresponds to the definition of data, information and knowledge. Data are the raw facts and figures before processing; in their raw state, data have little value beyond their inherent value as individual items. To make data useful, it must be manipulated into some form. Once manipulated, data in its new, usable state is referred to as information. Information is thus data that has been manipulated into some meaningful form such that it can now be applied in decision making. When facts (individual data items) are organized in some way, they become information. Information is processed data. Information may not be equally relevant in making an organization's (in this case school) decisions mainly because much of the meaningful details may still be hidden; the application of data analytics enables organizations to gain more insights from the data. This search for meaningful insights from the data is known as data mining. Data mining is thus defined as the extraction of meaningful relationships amongst data. The end product of data mining is referred to as knowledge. Knowledge is defined as the awareness and understanding of the relationships among the pieces of data. Once one is able to understand how the various pieces of data are related, they can now easily be able to make more informed, better decisions.

Thus, Rogers (2011) opines that data-based decision-making in schools is a systematic analysis of existing data sources and then applying outcomes of the analyses to innovate teaching, curricular, and school performance and then, evaluating those innovations. In the context of this study, data-based decision-making is used to refer to the purposeful use of information generated from data to inform all manner of decisions within a school with an aim of offering better services to students.

The growing emphasis on improved educational standards, equity, continuous improvement and accountability is a major challenge to secondary schools since they must prepare all students to succeed in academic and co-curricular activities (Rogers, 2011).

## **Data Analysis and discussion**

## Respondents Gender

A majority of the respondents were Female, representing 50.91% of the respondents while 49.09% of the respondents were male. This is shown in Figure 1.

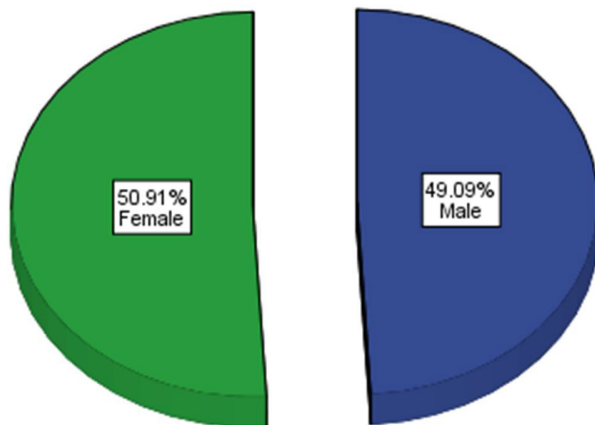


Figure 1: Respondents gender

## Respondent's Age

A majority of the respondents fell between the age of 31-40 years at 43.64%; 21.82% of the respondents were between the age of 18 and 30 while 19.09% and 15.45% of the respondents were between the age of 40-50 and 51 and above respectively. This is shown in Figure 2.

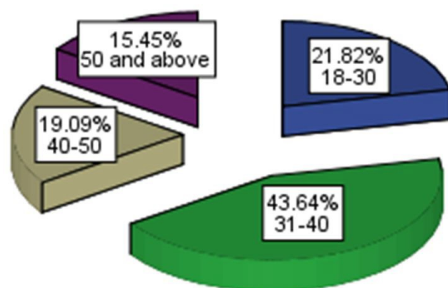


Figure 2: Respondents Age

## Respondent's Level of Education

56.36% of the respondents were holders of a Bachelor's degree while 30.91% and 12.73% had a Master's degree and a Diploma respectively. None of the respondents held a doctorate degree (PhD). This is shown in Figure 3.

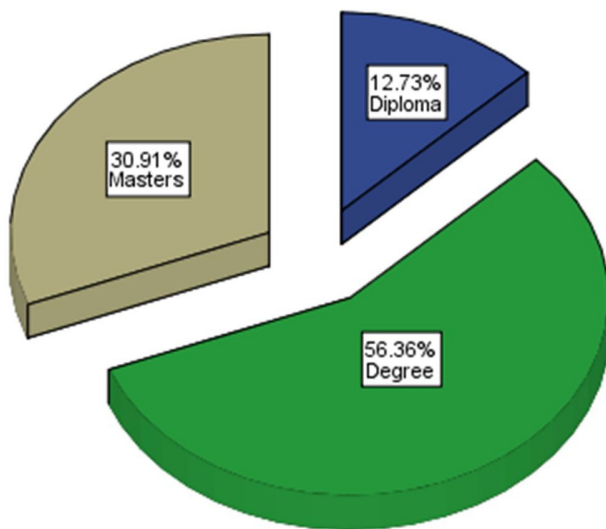


Figure 3: Respondent's Level of Education

### **Level of Experience**

A majority of the respondents had worked as teachers for a period between 5-10 years. This group represented 34.55% of the respondents. 28.18% had experience of between 11-15 years while 21.82% and 15.45% of the respondents had experience of 1-5 years and 16 years and above respectively. This is shown in Figure 4.

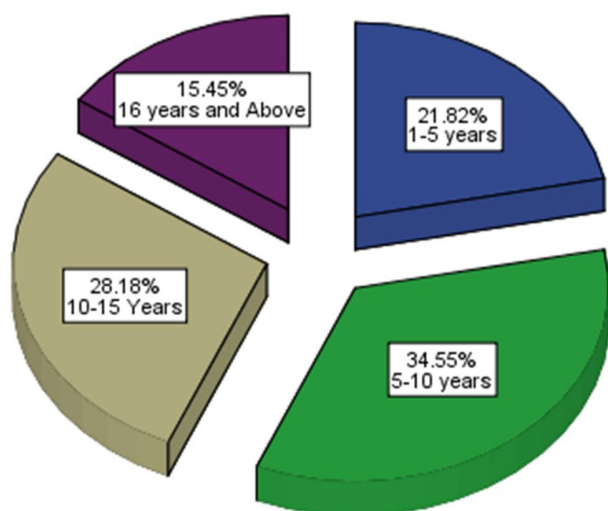


Figure 4: Respondent's Experience in Years

### Prevalence of data driven decision making

A mean of 3.61 of the respondents said that they understand what data driven decision making is. This falls within the range of "Neutral" which can be interpreted to mean that a majority of teachers have no idea what data-driven decision making is. This is shown in Table 1

Table 1: Prevalence of data driven decision making

#### Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
I understand what data-driven decision making is	150	1	5	3.61	1.242
Valid N (listwise)	150				

A majority of respondents remained neutral when asked whether much of the decisions in their schools was based on analyzed data. A mean of 3.75 responded to the affirmative. This falls within the “neutral” range hence this can be interpreted to mean that a majority of the respondents could not accept nor deny whether they base their decisions on data. This corresponds to the arguments in Table one where a majority could not confirm neither deny their understanding of data-driven decision making. This is shown in Table 2

Table 2: Prevalence of data-driven decision making

**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
data driven decision making informs much of my school decisions	150	1	5	3.75	1.321
Valid N (listwise)	150				

**Dependence of data-driven decision making in Kenyan Schools**

A majority of respondents were still not sure on whether data driven decision making is critical in making every school decision with a mean of 3.59. When asked whether data driven decision making leads to better decisions, a majority of the respondents remained neutral. This can be linked to little understanding of the topic and lack of prior experience on data-driven decisions. This is shown in Table 3.

Table 3: dependence of DDDM in making school decisions in Kenya

**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
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data driven decision making is critical in making every school decision	150	1	5	3.59	1.493
data driven decision making can lead to better school decisions	150	1	5	3.43	1.421
Valid N (listwise)	150				

### Data driven decision making and quality of education

A mean of 3.41 and 3.21 could not confirm whether Data-driven decision making can lead to improved school performance or whether data driven decision making leads to better quality education. This is shown in Table 4

Table 4: DDDM and the quality of education

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
data driven decision making can lead to improved school performance	150	1	5	3.41	1.568
data driven decision making leads to better quality education	150	1	5	3.21	1.329
Valid N (listwise)	150				

### Conclusion

Based on these results, it is clear that

- i. The pervasiveness of data-driven decision making is very low in public secondary schools
- ii. Dependence on data for decision making in public secondary schools is still very low

All these points can be related to little understanding amongst teachers and school management on data driven decision making in public secondary schools. The understanding of the role of data driven decision making in improving school performance in public secondary schools is still low

## **Recommendations**

Based on this research, it is the recommendation of the researcher that for improved quality of education within public schools, driven by better decisions, much more focus needs to be directed towards not just gathering data in schools but also on analysis of the same to provide useful intelligence to guide decision making.

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