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COLLEGE OF BIOLOGICAL AND PHYSICAL SCIENCES
SCHOOL OF MATHEMATICS

AHMED ABDI WAHID

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**DETERMINE THE DIFFERENCE IN PERFORMANCE
BETWEEN INTERGRATED SCHOOLS AND NON-
INTERGRATED SCHOOLS**

**A PROJECT SUBMITTED TO THE SCHOOL OF
MATHEMATICS IN PARTIAL FULFIMENT OF THE
REQUIREMENTS FOR THE POST GRADUATE MASTER OF
SOCIAL STATISTICS.**

NOVEMBER 2013

TOPIC:

Determine the difference in performance

between integrated and non integrated schools

In Eastleigh Nairobi

using two sample t-test:

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DECLARATION

I hereby declare that this project is my original work and was not presented for any degree in any other university

Signature.....Date.....

Ahmed Abdiwahid Abdirahman

This project has been submitted for examination and with my approval as university supervisor

Signature.....Date.....

SUPERVISOR: DR. NELSON OWOUR ONYANGO.

, University of Nairobi Kenya.

Acknowledgement

I pleased to may thanks to allah who was created for every body

And allowed me to finish my project.

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CHAPTER ONE

Introduction:

Background information

Among the properties of statistics is mean which a measure of central tendency. It is greatly applied in the day-to-today activities of various fields of life like health sector, economy, educational sector, literature and so on.

Here we consider education specifically two categories of schools: integrated and non-integrated schools. An integrated school is one that provides education that combines religious and secular concepts: the aim is to provide a balanced education while giving the parents, teachers and pupils an opportunity to understand and respect all religious and cultural backgrounds.

Generally, any method used to solve a problem will have weaknesses and strengths but the strengths of the method must outweigh the weaknesses for tangible results to be achieved. Now here both integrated and non-integrated schools have weakness in their quest to impart knowledge to the young generation but we shall compare the two to see which one is more effective.

In my analysis, I had a look at a number of schools for a few consecutive years, observed the trend in their national examination performance comparatively (i.e between the integrated and non-integrated schools) and made conclusion by application of mean as the main measure. After having realized the changes the schools performance, I tried to find out reasons for the differences. I visited schools and various methods to obtain data. The data collection techniques were mainly questionnaires and oral interviews with the various stakeholders such as the teachers, students and a few parents.

All the stakeholders cited religion as great contributor to the trend. Religious factor plays a great role according to the people I contacted. Many parents of the children in the studied area have a common faith(Islamic faith) and they want their children to learn the religion including its language(Arabic) at the early age. They therefore send their children to such schools in unpredictably large numbers sometimes hoping that the children will be morally upright and academically excel as well.

This prompted me to further look at advantages and disadvantages of integrated schools compared to non-integrated schools. Techniques used to find mean include the T-test analysis method, using R-cods and graphical methods. Plots of T-test are made to analyze the mean.

In our study, area of focus is Eastleigh, Nairobi. After discussing and analyzing the data, a final judgment is made as the conclusion.

It is assumed that all other factors remain constant. There are maybe other factors such poverty level, standard of teaching and so on. However it is assumed that in terms of issues like teaching the schools have similar fate. These factors are not given much consideration since both categories of schools are located in the same area, and hence what affects one category will likely affect the other one.

1.2 Advantages of integrated schools

It gives the pupils understand and respect all cultural and religious backgrounds. The pupils get the opportunity to learn a number of religious books at an early age. They will deeply understand the history of their religion, the various religions that exist in the world and hence will have respect for not only their religion but also other religions as well. In comparison; the non-integrated schools have only IRE or CRE and do not have as much exposure to religious books

Moral enrichment. The pupils are taught certain religious principles that which requires them to maintain high discipline and moral values. For instance, misuse of drugs is a prohibited in Islam and the pupils are told to avoid it. In so doing the negative effects that drugs might bring to the academic performance of the pupils are not encountered. In non-integrated schools such principles are too taught but the difference comes in due to the greater number of religious books in integrated schools bringing a repetitive nature in the child `mind.

Attainment of more knowledge. Integrated schools offer additional subjects which increase the knowledge of the pupils. For instance, pupils in integrated schools are taught five other subjects(Arabic, Sira, Fiqi, Hadith and Towhid)

Table (1-1)

Subjects of Islamic integrated schools	Mean of subjects
Arabic	Language
Sira	History of prophet
Fiqi	Islamic jurisprudence
Hadith	Islamic theology
Towhid	Monotheism

in addition to the ordinary subjects. This means that the child in an integrated school has a variety of knowledge that the one a non-integrated school does not have.

Training of time management. The fact that more subjects are taught calls for the time management. Pupils come up with a way of ensuring that they study well in the subjects. A pupil in integrated school has ten subjects to study whereas one in a non-integrated school has only five subjects. So pupils in integrated schools are necessitated to think well and make good use of the inadequate time they have. The skills of time management which are acquired at this early are very useful later in life.

Sustainability of religious principles and cultural values. Many times it happens that good practices that were previously observed are forgotten. When pupils are taught such principles and values, then it is not easy for them to die off. For example if the contents of the Quran are not taught, then it will be difficult to practice since one is rather ignorant of the teachings. So a child in integrated school will definitely be remembering the bulky of the religious material more than a child in non-integrated school who was little in the first place.

1.3 Disadvantages of integrated schools as compared to non-integrated schools:

Increased workload. The pupils in integrated schools have more work to handle than the ones in non-integrated schools. The five parallel subjects(Arabic,Fiqi, Sira, Hadith and Towhid) are the extra works which the students have to bear. This means that students have little time to rest if any at all.

Financial burden to the parents. The introduced religious subjects come with extra fees which should be shouldered by the parents. Parents have no option but to pay the fees as demanded by schools management. This may force some parents to quit the system due to financial strains. A parent who opts that his child will not be taught the extra subjects will pay relatively less fees.

It is cumbersome to start due to the large staff requirement as well as educational materials. To initiate an integrated school, one needs to two different categories of teachers (teachers for religious subjects and other teachers for the secular subjects) because it not easy to find one teacher who is good in both systems. Starting a non-integrated school is relatively easy as it is only one system, not two in one as in integrated schools.

They lack cultural and religious interaction. Integrated schools are usually constituted and affiliated to a particular religious group. For example in this case it is Muslims. This means that students going to these schools are purely Muslims. The interaction between Muslim and non-Muslims that is available in non-integrated schools is absent here since all the students belong to the same religious group.

1.4 Statement of the problem:

As earlier mentioned in the introduction, it is rare to achieve 100% of the desired results due to some hindering factors which we look at as weakness. However we try to find the most efficient way of achieving the goal. At hand here need to compare two educational systems and make a judgment on which is better. This is done both mathematically mean and in wording by using the collected data.

1.5 Objectives of the study

1.The major objective of the study is to determine if there is any difference in performance of integrated schools and non integrated schools .

1.6 Specific objectives

The study specifically aims:

- 2.To determine if the additional subjects in integrated schools affects the students performance.
- 3.To demonstrate statistical procedure of performing T-test method

1.7 Justification

This study will give the differences of average mean performance of integrated and non-integrated schools, analysis of the reasons in the mean difference and the application of statistical methods of solving problems

1.8 Organization of the project

The first chapter talked about mean and its application through introduction of the study. This chapter also touched the statement of the problem, objectives and justification. The second chapter outlines literature review Here we have taken a number of researches concerning education, some specifically having direct relationship with integrated schools system, that were carried out by various individuals. The third chapter the methods used to determine the performance of the students of two categories of schools while chapter four settles for data analysis using two sample T-test and the outcomes. Then finally chapter five is all about discussions and conclusions.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction.

2.2. TO CONSIDERED NUMBER OF RESEARCHER

2.1. Introduction.

Knowledge of Statistics gets enhanced and advanced with time. The research carried out today is more advanced than the one carried out some years back and the ones to be done later will be even better than this because with time ,

People discover new methods of undertaking the research and there is increase in the application of technology in data collection, evaluation and analysis. This will only be possible if we look back and see the works of other people. Here can borrow something from them and correct some mistakes they might have made. In that way our efficiency and accuracy of work gets better.

Again it is important to note that statistics deal with majorly conclusions and predictions resulting from outcomes which take place in cautiously

Planned experiments or in visitations in the finite case this chances results constitute a subset or sample of measurements or observations from a larger set of values called population. (Montgomery ,2000;Wetherill 1991).process stability is reflected constant mean and difference mean The term ‘infinite’ means that there is no limit to the number of values that we can observe.

2.2 TO CONSIDERED NUMBER OF RESEARCHER

Here I considered a number of researches concerning education, some specifically having direct relationship with integrated schools system, that were carried out by various individuals. The first one done by Adan Saman Sheikh(July 2013) entitled: Islamic Education In Kenya A Case Study of Integrated schools in Grissa County.

This thesis explores the challenges facing Islamic education in Kenya with specific reference to Islamic Integrated schools that combines the national secular public school curriculum and Islamic education curriculum as taught in Madrasas and Qur'anic schools. The study note that Islamic education has continued to adapt to the different environments and Islamic Integrated schools are not an exception. It says despite the many challenges, the schools have continued to provide a wholesome education, and in some areas by-passed the secular public schools in enrolment attainment. The study has utilized the phenomenological approach to capture and describe the essence of Islamic Integrated Schools as a social phenomenon and the challenges they face in providing two different types of knowledge with different values. This study on the challenges facing Islamic Education in Kenya had four objectives: a) to identify the rationale for the establishment of Islamic integrated schools in Kenya b) to examine the curriculum of Islamic Integrated schools in terms of the number of subjects taught and the amount of content to determine curriculum overload c) to investigate the role of Islamic Integrated Schools in the education of Muslim children d) to explore the challenges facing Islamic Integrated schools. Field data from Garissa County was used to confirm the findings of the study. This study says that Madrasas, autonomous purely Islamic schools Islamic could not satisfy people alone as secular education also became necessary and so the idea of integrated schools was brought in . Concerns have been raised about the amount of time children spend in the Islamic Integrated schools but the schools were found to cover two broad curricula which obviously calls for more time. Finally, the study has identified the urban and ethnic bias of the Islamic Integrated schools phenomenon. The founders and more than 80 percent of the learners

were found to be of the Somali ethnic group. This is an area that requires further study as it would be of interest to Sociologists and Anthropologists. There will also be need to study the implication of teaching two foreign language(Arabic) and a national language to pre-school and lower primary school children.

Another research is one written by Salah M. Egueh (2003-2011) entitled: Universal Primary Education, Case study in Garrissa county still. This book mainly concentrated on whether the dream of every child into by introducing free primary education has been achieved in Kenya. However the area of our interest which touched is the issue of integrated schools. It says many pupils have run away from primary government schools for poor teaching and from integrated schools for increased loadwork. It notes that private schools which are non-integrated are rare to find in the area due to the fact that these areas are mainly dominated by Muslims. It says integrated schools quality education but many pupils find it hard to cope the many subjects taught especially those in upper primary who are preparing to sit for their national examinations, KCPE and so end up dropping out of school or perform relatively poor as compared to those in non-integrated schools.

Finally another source is a book titled faith, education and culture in pre-colonial period 'by Paul Odour (1985).This book says that education for the African people was not easy because the whites were mainly running education incorporated with Christian faith and the Africans did not want to give up the cultural beliefs. However with time the integrated schools earned the heart of the indigenous people. People who hesitated to join these schools realized that they were indeed incorrect after seen

very educated disciplined children who have gone through the missionary schools. The missionaries to taught both the Christian faith and secular education and molded the character of their students for the better just like the Islamic scholars were trying to teach the Islamic at the Coast of Kenya by all means. Odour's work thus depicts these school as integrated schools though that was not the name given to them.

CHAPTER THREE

METHODOLOGY:

3.1 Explanation of data together with data sources

3.2 Confidence level for change

3.3 Sampling distribution

3.4 T-test one sample test

3.5 two sample t-test.

3.1 Explanation of data together with data sources

The data that we have used in this study was obtained from various integrated schools and non integrated schools that exist in Eateight, Nairobi. These schools of integrated schools offer both religious Islamic and secular education and so the study relies on their data. The issues focused include the trends in the enrolment, performance as well as the number of school a given period of time(from 1998-2012). The schools that were used as samples include Ansaru sunna, Imamu Nabawi, darusunah , ,hami school and so on

These data has been analysed and conclusion made at the end of the study.

3.2 Confidence level for change

The determine performance of the students you now your confidence level through point analysis have confidence level. statistically significant confidence level should be 95%. T and my data i used $\alpha=0.05$

The confidence level is based on the significant level,p-value or alpha-level.p-value can be defined as the probability that results from natural variation in the data assuming no change has occurred. Note that the greater the p-value, the smaller the evidence of change and the vice-versa.

Therefore confidence level .

Table (3-2)

Confidence level	Alpha level
99%	0.01
95%	0.05
90%	0.1
80%	0.2

3.3 Sampling distribution of mean

It is also important to note that all the used are not conventional. A scientist may choose a small number of a larger quantity to represent the whole population. For instance to estimate the average useful life of a certain kind of a transistor, an engineer may select 8 of these transistors, tests them over a period of time and records each one the time it fails. If these times to failure are values of random variables having an exponential distribution with parameter θ , we say that they make up a sample from this exponential population.

Here we deal with random samples from integrated schools and non-integrated school

Definition 1: if x_1, x_2, \dots, x_n are independent and identically distributed random variables, we say that they constitute a random sample from the infinite population given by their common distribution.

If (x_1, x_2, \dots, x_n) is the value of the joint distribution of such a set of a random variables at (x_1, x_2, \dots, x_n) , we can write

$$f(x_1, x_2, \dots, x_n) = \prod f(x_i)$$

Where $X = (x_1, x_2, \dots, x_n)$

Defination2:

If x_1, x_2, \dots, x_n constitute a random sample, then

$$\bar{x} = \sum \frac{x_i}{n}$$

Is called sample mean and

$$S^2 = \frac{\sum (x_i - \bar{x})^2}{n-1}$$

Is called sample variance.

As we see, these definitions apply only to random samples, but the sample mean and the sample variance can also be defined for any set of variables (x_1, x_2, \dots, x_n) . It is also common to apply the terms' random sample statistic sample mean, and sample variance to the values of random variables

Instead of the random variables themselves. This makes more sense and is in line with the colloquial usage. So the calculation is done like this for observed sample data and refer to these statistics as the sample mean and the sample variance:

$$\bar{x} = \sum \frac{x_i}{n} \quad \text{and} \quad S^2 = \frac{\sum (x_i - \bar{x})^2}{n-1}$$

In this case, the x_i , \bar{x} and s^2 are values of the corresponding random variables of X_i , \bar{X} and S^2 .

One should note that we took \bar{X} and S^2 just as examples of statistics and many other statistics will be introduced later in this chapter as well as other chapters to follow.

In order to minimize the long-run average costs of the cusum scheme, parameters n , h and k are selected.

The sampling distribution of the mean was defined in the section introducing sampling distributions. This section reviews some important properties of the sampling distribution of the mean, which were introduced in the demonstrations in this chapter.

3.4 Mean (μ)

The mean of the sampling distribution of the mean is the mean of the population from which the scores were sampled. Therefore, if a population has a mean μ , then the mean of the sampling distribution of the mean is also μ . The symbol μ_M is used to refer to the mean of the sampling distribution of the mean. Therefore, the formula for the mean of the sampling distribution of the mean can be written as:

$$\mu_M = \mu$$

VARIANCE

The variance of the sampling distribution of the mean is computed as follows:

$$\sigma_M^2 = \frac{\sigma^2}{N}$$

That is, the variance of the sampling distribution of the mean is the population variance divided by N , the sample size (the number of scores used to compute a mean). Thus, the larger the sample size, the smaller the variance of the sampling distribution of the mean.

(optional) This expression can be derived very easily from the variance sum law. Let's begin by computing the variance of the sampling distribution of the sum of three numbers sampled from a population with

variance σ^2 . The variance of the sum would be $\sigma^2 + \sigma^2 + \sigma^2$. For N numbers, the variance would be $N\sigma^2$. Since the mean is $1/N$ times the sum, the variance of the sampling distribution of the mean would be $1/N^2$ times the variance of the sum, which equals σ^2/N .

The standard error of the mean is the standard deviation of the sampling distribution of the mean. It is therefore the square root of the variance of the sampling distribution of the mean and can be written as:

$$\sigma_M = \frac{\sigma}{\sqrt{N}}$$

The standard error is represented by a σ because it is a standard deviation. The subscript (M) indicates that the standard error in question is the standard error of the mean.

3.5 T-test

A ***t*-test** is any statistical hypothesis test in which the test statistics follows a Student's t distribution if the null hypothesis is supported. It can be used to determine if two sets of data are significantly different from each other, and is most commonly applied when the test statistic would follow a normal distribution if the value of a scaling term in the test statistic were known. When the scaling terms is unknown and is replaced by an estimate based on the data, the test statistic (under certain conditions) follows a Student's t distribution.

One-sample t -test

In testing the null hypothesis that the population mean is equal to a specified value μ_0 , one uses the statistic

$$t = \frac{\bar{x} - \mu_0}{s/\sqrt{n}}$$

where \bar{x} is the sample mean, s is the sample standard deviation of the sample and n is the sample size. The degrees of freedom used in this test are $n - 1$. Although the parent population does not need to be normally distributed, the distribution of the population of sample mean \bar{x} , is assumed to be normal. By the central limit theorem, if the sampling of the parent population is random then the sample means will be approximately normal. (The degree of approximation will depend on how close the parent population is to a normal distribution and the sample size, n .)

Our case we can not applied one sample t -test since they are two groups .

two sample t -test

To compare responses from two groups. These two groups can come from different experimental treatments, or different natural "populations".

Assumptions

- each group is considered to be a sample from a distinct population
- the responses in each group are independent of those in the other group
- the distributions of the variable of interest are normal.

formula and way we use

1. The null hypothesis is that the two population means are equal to each other. To test the null hypothesis, you need to calculate the following values: \bar{x}_1, \bar{x}_2 (the means of the two samples), s_1^2, s_2^2 (the variances of the two samples), n_1, n_2 (the sample sizes of the two samples), and k (the degrees of freedom).

$$\bar{x} = \frac{1}{n} \sum_{i=1}^n x_i = \frac{1}{n} (x_1 + x_2 + x_3 + \dots + x_n)$$

$n = \text{sample size}$

$$S^2 = \frac{\sum (x_i - \bar{x})^2}{n-1}$$
$$= \frac{1}{n-1} [(x_1 - \bar{x})^2 + (x_2 - \bar{x})^2 + (x_3 - \bar{x})^2 + \dots + (x_n - \bar{x})^2]$$

Long formula

$$s^2 = \frac{1}{n-1} \left[\sum x_i^2 - \frac{1}{n} \left(\sum x_i \right)^2 \right]$$

hand calculation formula

$$k = n_1 + n_2 - 2$$

2. Compute the t -statistic.

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\left(\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2} \right)}}$$

3. Compare the calculated t -value, with k degrees of freedom, to the critical t value from the t distribution table at the chosen confidence level and decide whether to accept or reject the null hypothesis.
4. We reject the null hypothesis when: calculated t -value $>$ critical t -value.
5. Our case here there are two data from integrated schools and non integrated schools so that we need to computed t-test of integrated

CHAPTER FOUR :

4.1.SAMPLE EXPLANATION

4.2. Output of the t-test

4.3. T-test analysis:

4.5 Plots of test.

4.1 SAMPLE EXPLANATION:

The cumulative sum points analysis method was applied to integrated schools and non integrated schools cases of Eatleigh, Kamakunji in Nairobi from 1998 -2012 in 10 schools of integrated schools and non integrated schools

The mean score of integrated schools for individual subjects and even average mean is different from the mean score of non-integrated schools. This can be seen from data we I have analyzed as shown in the tables

From here we can make decision on which is schools are performing better by just looking at the mean difference

analysis of the data using R-codes
of integrated vs non integrated schools

Assumption.

- The distribution of the two groups is normal
- The response from the two groups are independent of each other.
- Each group is considered to be a sample from a distinct population
-

Hypothesis

H_0 : mean of integrated schools = mean of non integrated schools.

H_1 : mean of integrated schools \neq mean of non integrated schools.

Normality t-test

- We carry out the normality test using the **Shapiro test** criteria
- The test results for Shapiro test gives us a p-value of 0.7929 which close to unity (1) showing that the data is normal.

Table (4-3)

4.2 Output of the data

	t-test	P-value	Mean of integrated	Mean of non integrated	Confidence interval
English	6.5516	1.477e-06	66.7	78.6	(-15.670, -8.130)
Maths	7.1476	1.739e-07	67.03333	80.34000	(-17.141, -9.472)
Kiswahili	5.6035	5.496e-06	69.73333	82.44000	(-17.353,-8.060)
Sst/re	6.411	6.202e-07	79.43333	65.13333	(9.730 , 18.870)
Science	8.8667	2.193e-09	66.8333	83.9	(-21.103 ,-13.164)

Table (4-4)

4.3 Analysis of the data

Subjects	Mean of integrated schools	Mean of non integrated	Calculated t-values	Table (critical value)	Conclusion
English	66.7	78.6	6.55	2.048	Reject H_0
Maths	67.03	80.34	7.15	2.048	Reject H_0
Kiswahili	69.73	82.44	5.60	2.048	Reject H_0
Sst/re	79.43	65.13	6.41	2.048	Reject H_0
Science	66.83	83.9	8.87	2.048	Reject H_0

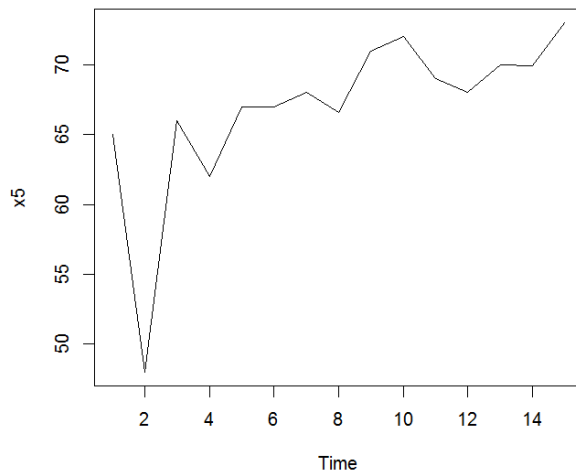
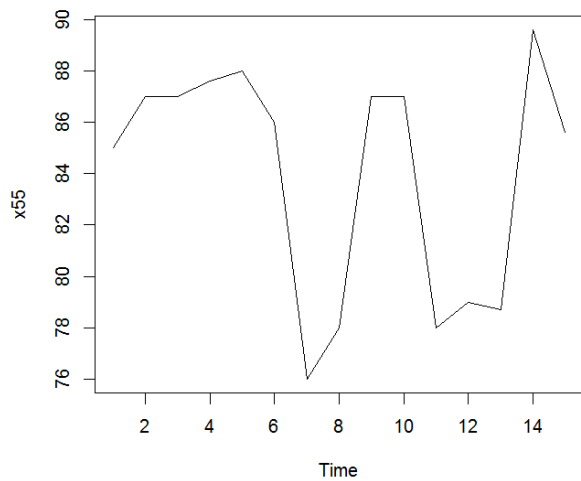
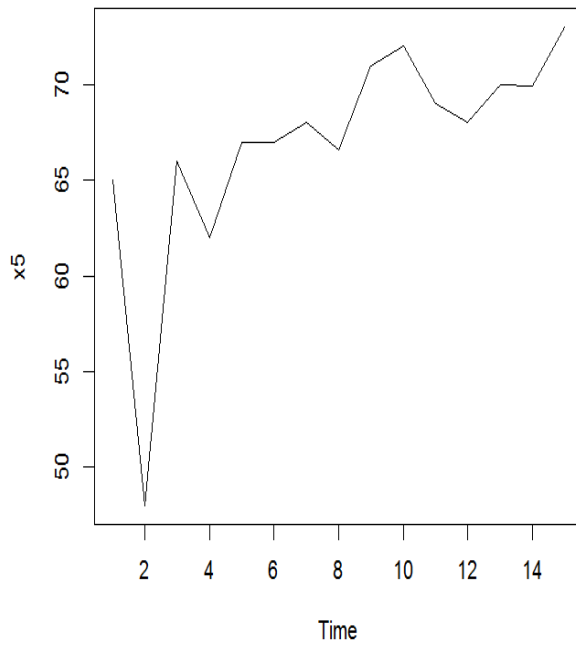
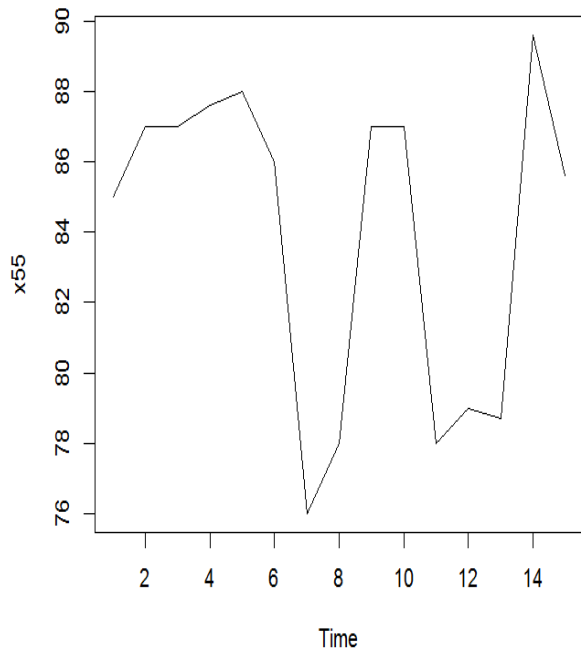
Discussions

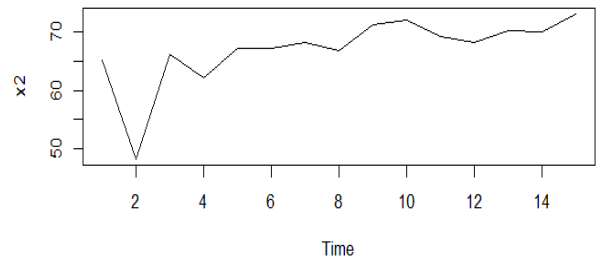
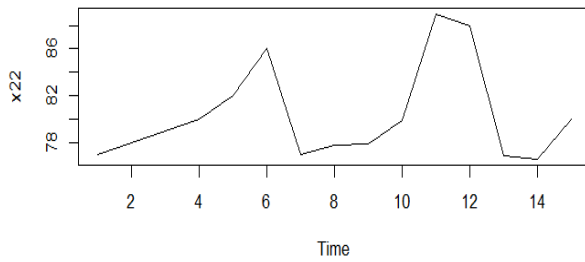
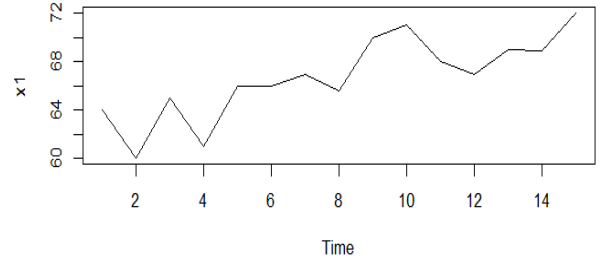
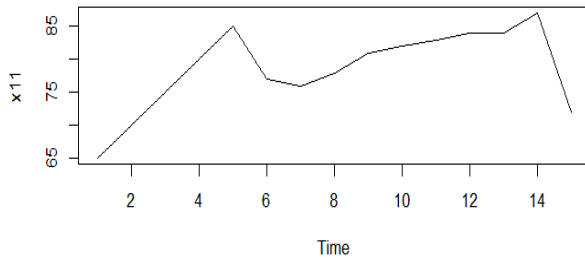
- For all the subjects, we reject the null hypothesis which says that the performance in integrated and non integrated schools are they not same and conclude that the performance in these schools for all subjects is significantly different using the data given at 0.05 level of significance and 28 degrees of freedom.
- Non integrated schools performs better than the integrated schools. Because they have higher means than the integrated schools
- In the subject of social/religious , the mean of integrated school greaten than mean of non integrated school .

Because religious books they learned at an early age. They will deeply understand the history of their religion, the various religions that exist in

the world and hence will have respect for not only their religion but also other religions as well. In comparison; the non-integrated schools have only IRE or CRE and do not have as much exposure to religious books

4.4 Plots of tests





In the diagram (x_1, x_2) and (x_5) means integrated schools .

Also (x_{11}, x_{22}) (x_{55}) non integrated schools.

Names of ordinal data integrated schools $(x_1, x_2, x_3, x_4, x_5)$.

$$x_1 = \text{english}$$

$$x_2 = \text{mathematics}$$

$$x_3 = \text{kiswahili}$$

$$x_4 = \text{socail/religous}$$

$$x_5 = \textit{science}.$$

And other side

Names of ordinal data non integrated schools

$$(x_{11}, x_{22}, x_{33}, x_{44}, x_{55},)$$

$$x_{11} = \textit{english}$$

$$x_{22} = \textit{mathematics}$$

$$x_{33} = \textit{kiswahili}$$

$$x_{44} = \textit{socail/religous}$$

$$x_{55} = \textit{science}.$$

From the above diagrams $(x_1, x_{11}) (x_5, x_{55})$

We find out that the performance of students in non integrated school is better than that of integrated schools. The difference in performance may have been brought about by one major factor which is difference in the number of subjects taken. Students in Integrated schools are pursuing ten subjects; five secular and five religious whereas students in non integrated are taking five secular subjects. From the given scenario the difference in workload automatically affects the output, in this case the performance.

The general view that one can get after a keen analysis is the major difference in the mean marks of the two schools. From the given diagrams we find out that students in integrated schools are getting a mean that ranges between 60 to 70, while those in non integrated schools are getting a mean that ranges from between 70 to 83

Generally we can say that both schools have done exceedingly well because they have achieved above 55 marks

CHAPTER FIVE.

5.1 Discussion

After having collected, evaluated and analyzed data, I discuss the problem as at a general review. The argument revolve around integrated and non-integrated schools in their most important aspects at hand such as: the existence of the two categories of schools, historical background and issues that necessitated creation of integrated schools, comparison of effectiveness of the two categories of schools when it comes to achieving the sole aim i.e. excellent academic performance, reasons for the mean difference in the national examination performance ,the administration of integrated schools and future predictions of how the two schools will be on the same issues: as to which one will be superior to the other or will they be at par? Another important point of discussion is the mean application in the data.

IT is evident that two categories of schools do exist in different parts of Kenya. Some counties have more integrated schools than others reason being their religious affiliation. The history of integrated schools is not in the country as it is dated back to the pre-colonial period when the Arabs and the Christian missionaries were competing for the indigenous people. The Christian missionaries set up schools with the parallel aim of spreading Christianity and the Arabs were doing similar thing the coast to spread Islam. Integrated Islamic schools can be seen in Mombasa, Garissa, Nairobi (Eastleigh which is our case study), and several other towns in Kenya.

The main factor that necessitated creation of integrated schools is religious. This is the response I got in 99% of my both questionnaires and interviews I made with the people in the studied area. The other 1% responded by saying that really don't know, because of respectable

individuals they know in those schools or the children just chose and the parent had to accept. Many parents would want their children to their religion before anything else. In the past the children were taken to Quranic schools (only the Quran is taught) and Madarasa (a system where both religious and secular subjects are taught in Arabic). The disadvantage with system is that children are made to school late and to that effect some children would not want to join standard one at a time when are relatively old in respect to that level. An alternative had to be found where children can go to school at the right time and at the same time study the Qur'an as well as other Islamic religious books. Thus, the idea of Integrated schools came in, which is a better method though it has disadvantages too as mentioned in my introduction of the book.

From the data analyzed, the non-integrated schools have greater average mean in all the subjects except social studies as shown in the mean average summary table. This means that the non-integrated schools are generally performing the national examinations better than integrated schools. The point of interest then that came in is the exceptionally better performance by the integrated schools. This is accounted for by the fact that social studies has 30% of the 100% as the religious portion and these have additional number of religious subjects, leading as to the conclusion that in average, the child in an integrated school better equipped for religious education, and hence better performance in social studies than the child in a non-integrated schools.

The difference in the performance could be due various reasons but the one that was very evident from the collect is the fact that pupils in integrated schools have more subjects to read for than the pupils in the non-integrated schools and as so they don't get sufficient time digest well the concepts of the examinable subjects in the national examinations. Again some students find the religious subjects more

interesting than the secular ones and so end up in giving less attention to the national five examinable subjects.

These schools are regarded as private schools and they fulfill the legal requirements of private schools but inside, their curriculum seems to be unregulated. There is no uniform way of incorporating the religious subjects into the system. For example one school teaches these nationally unexaminable subjects from standard one to standard eight while another teaches up to standard seven. So these loopholes may contribute to the poor performance. On the other hand, non-integrated schools follow uniform approach when it comes to the number of subjects taught. The examinable subjects are given priority.

Now the future of these schools mainly depends on the players of these schools. These integrated schools can be run better than they are doing now. For example they reduce the number of unexaminable subjects to smaller number and concentrate on the examinable ones. They can also decide to teach these subjects until say up to standard four and from there on the national examinable subjects are concentrated. In this way integrated schools will be able to have a chance of competing with the non-integrated schools and even beating them.

However failure to come up with better policies will mean that they will academically remain in the tail. This is because competition will even get stiffer and the non-integrated schools will even better methods in their prioritization of the national examinable subjects. The extra time is well used for revision for instance in non-integrated schools while pupils of integrated are struggling the bulky assignment of the various subjects. This will definitely give the non-integrated schools an upper hand over the integrated schools when it comes to performance.

Finally we look at the collected data and use mean for analysis. We use mean to compare the performance of schools in the national examinations. This method was found to be effective because a clear difference can be made in the respective subjects when making a comparison in their performance. For instance the mean performance for Kiswahili in the considered period is 80.03 for non-integrated schools and 67.03 for integrated schools. From there we can calculate the difference. Through this method we are able to clearly state the category of schools that perform better in the examination.

5.2 Conclusion:

We have shown the application of mean in day-to-day activities of man as measure of central tendency. This was first done by using the data that was collected from the study of integrated and non-integrated schools. The mean performance of each of the two categories of schools was calculated practically and then analysis of the same data was made ideologically. By use of mean difference in performance of the schools comparatively, and by ideological analysis, we can say in a nutshell that non-integrated school system set by the government of Kenya for primary schools is better for the success of secular education than the integrated system that was initiated by a few individuals for reasons we have discussed.

5.3 Recommendations

A couple of actions should be taken for the integrated schools to give fruitful results. On top of the list, is reduction of the number of religious subjects. The most important religious subjects such as the Qur'an and the Hadith can be retained while the rest can either be scraped or made optional so that only those pupils who think they can manage can continue with. This will ensure that the work is reduced without losing the purpose of religious studies.

Introduction of a system where pupils in upper primary school are excused from the religious subjects can also be adopted. The integrated schools can decide to teach both secular and religious subjects from standard one to standard five. Then afterwards, only the national examinable subjects are taught and prepared for while. By now the child has gained enough religious knowledge and it is time to excel in the

national exams, KCPE. In this the purpose of the integrated schools idea will be achieved.

Government regulation. The government should ensure any system people come up with as an inclusion to the government set system is one that cannot interfere with national goal. The government and management of these schools should sit together and see how best they can improve the educational standards while at the same time giving considerable attention to religious studies.

Hiring teachers who are qualified in both systems. This ensures that there is a balance between the two systems. This kind of teachers will ensure that they the most important aspects of religion in summarized form and then invest well in the nationally examinable subjects. If a teacher is knowledgeable well in religion only, it is likely that he/she would want the pupils to study that bulky knowledge which affects the other side; hence there is a biased approach.

Benchmarking and studying the tactics of the private non-integrated schools which are performing extremely well. The integrated schools can intermingle with those schools and see what they are doing because it is only when you know what your competitor is doing that you can set a mechanism to prepare well for and defense and aim at winning.

These were not the only recommendations but they were the most frequently ones by the people I contacted through interviews and questionnaires. It is therefore important that the integrated schools take some of those positive actions if not all, for them to achieve excellent results in both the religious and secular sectors.

5.4 Limitations of the study

It is important to note that any work done may not be perfect and so have some shortcomings. The only thing one can do is to try minimize those shortcomings as much as possible. A few of the limitations of this study may be the assumptions made and a few dependent responses that some people might have given during interviews and filling of questionnaires.

During the study, various assumptions were made. For instance, factors such as standards of teaching were overlooked and yet it can be a good contributor. For example if someone wants to start an integrated school, he/she will study the teaching staff of the already existing integrated schools in the area and if so is likely to hire similar staff thinking that it is the best since those schools are just doing well in terms of population. So in the end, most integrated schools have poor teaching staff, a factor that favors non-integrated schools.

Again, some people may not have given their actual responses. Remember some of the respondents were pupils and some of them might have just filled the questionnaires whatever their friends filled with (borrowed/copied ideas). Some were even trying to advise others on how to respond to the questions in the interviews. These independent may have some input in the accuracy of the final output of the study.

It is however important to note that those limitations will not change the actual findings. They will reduce the confidence level to 95% as seen in our data analysis.

5.5 Summary of the research project:

- **Problem statement**

To determine the difference in performance between the students in integrated schools and the students of non- integrated schools.

OBJECTIVES .

Main objective

To determine if there is any difference in performance of integrated and non integrated schools

Specific objective

- To determine if the additional subjects in integrated schools affects the students performance.
- To demonstrate the statistical procedure of comparing means using two t-test

Literature review

- Here I considered a number of researches concerning education, some specifically having direct relationship with integrated schools system, that were carried out by various individuals.
- **Adan Saman Sheikh (July 2013)** studied Islamic in integrated schools in Garissa county and found that integrated schools have more advantage since they have balanced education system compared to the non integrated schools
- **Salah M. Egueh (2003-2011)** studied weather the free primary education has been achieved in Garissa county and found that most integrated schools in Garissa have poor performance compared with private schools
- **Paul Odour (1985)** studied the effect of faith, education and culture in pre-colonial period and found that although integrated schools have more subjects to study and lead to poor performance, the students have a balanced education at long run which is beneficial to the students.

METHODOLOGY:

Let $x_1, x_2, \dots, \dots, x_n$ be independent and Identically distributed random variable .

The sample mean \bar{x} is given by

$$\bar{x} = \sum \frac{x_i}{n}$$

And the sample variance s^2 is given by

$$S^2 = \frac{\sum (x_i - \bar{x})^2}{n-1}$$

Two sample t-test.

We compute two sample t-statistics.

Which is given as .

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\left(\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}\right)}}$$

Where s_1^2 is the sample variance of integrated schools,

And s_2^2 is the sample variance of non integrated schools

Also n_1 the sample size of integrated schools

And n_2 is the sample size of non integrated schools

Hypothesis

The test of hypothesis

H_0 : the Mean of integrated schools = the mean on non integrated schools.

H_1 : the mean of integrated schools \neq the mean of non integrated schools.

Rejection criteria.

We reject the null hypothesis H_0 if the calculated t-value $>$ the critical t-value (from the table) with the $K(n_1+n_2 -2)$ degree of freedom at 0.05 confidence level of interval.

Assumption .

1. the distribution of mean is a normal.
2. the response of the two groups are independent.
3. each group is considered to be sample a distinct population.

Test normality of the data

- We carry out the normality test using the **Shapiro test** criteria
- The test results for Shapiro test gives us a p-value of 0.7929 which close to unity (1) showing that the data is normal.

Table (5-5)

Data analysis

subjects	Mean of integrated schools	Mean of non integrated	Calculated t-values	Table (critical value)	Conclusion
English	66.7	78.6	6.55	2.048	Reject H_0
Maths	67.03	80.34	7.15	2.048	Reject H_0
kiswahili	69.73	82.44	5.60	2.048	Reject H_0
Social/re	79.43	65.13	6.41	2.048	Reject H_0
science	66.83	83.9	8.87	2.048	Reject H_0

- For all the subjects, we reject the null hypothesis which says that the performance in integrated and non integrated schools are they not same and conclude that the performance in these schools for all subjects is significantly different using the data given at 0.05 level of significance and 28 degrees of freedom.
- Non integrated schools performance better than the integrated schools. Because they have higher means than the integrated schools
- In the subject of social/religious, the mean of integrated school is greater than mean of non integrated school

Conclusion.

- We have shown the application of mean in day-to-day activities of man as measure of central tendency.
- And have applied data collected from some of integrated schools

And non-integrated schools checking of mean difference in performance of the schools comparatively.

We founded there is a difference of mean .

Recommendation

- A couple of actions should be taken for the integrated schools to give fruitful results. They can reduce some subjects of religious like to remain 3 subjects only instead 5 or 6 .
- Introduction of a system where pupils in upper primary school are excused from the religious subjects can also be adopted. The integrated schools can decide to teach both secular and religious subjects from standard one to standard five.
- Government regulation. The government should ensure any system people come up with as an inclusion to the government set system is one that cannot interfere with national goal. The government and management of these schools should sit together and see how best they can improve the educational standards while at the same time giving considerable attention to religious studies and
- Also they can divide subjects half day learning secular subjects and another half religious subjects.

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Original data
data integrated schools

table 6

Year	English	Maths	Kiswahili	Sst/re	Scien
2012	64	65.2	67.9	79.5	65
2011	47	48.2	50.9	78.8	48
2010	65	66.2	68.9	78	66
2009	61	62.2	64.9	87	62
2008	66	67.2	69.9	89	67
2007	66	67.2	69.9	88	67
2006	67	68.2	70.9	77	68
2005	65.6	66.8	69.5	80	66.6
2004	70	71.2	73.9	76	71
2003	71	72.2	74.9	76	72
2002	68	69.2	71.9	78	69
2001	67	68.2	70.9	79	68
2000	69	70.2	72.9	69.8.4	70
1999	68.9	70.1	72.8	77.4	69.9
1998	72	73.2	75.9	87	73

Table 7 data of non integrated schools.

YEAR	EGLISH	MATHS	KISWAHILI	SST/RE	SCIENCE
2012	65	77	86.7	63.5	85
2011	76	78	87.6	46.4	87
2010	75	79	87.6	64.1	87
2009	80	80	88.6	60.2	87.6
2008	85	82	87.5	65.3	88
2007	77	86	88.4	65.2	86
2006	76	77	80.1	66.3	76
2005	78	77.8	76.6	64.9	78
2004	81	77.9	74.5	69.3	87
2003	82	79.9	75	70.	87
2002	79.0	74	72	67.3	71
2001	84	88	70	66.1	79
1999	84	76.9	79	68.3	78.7
2000	85	82	87.5	68.2	88
1998	87	76.6	89	71.3	89.6

YEAR	X11	X22	X33	X44	X55
2012	65	77	86.7	63.5	85
2011	76	78	87.6	46.4	87
2010	75	79	87.6	64.1	87
2009	80	80	88.6	60.2	87.6
2008	85	82	87.5	65.3	88
2007	77	86	88.4	65.2	86
2006	76	77	80.1	66.3	76
2005	78	77.8	76.6	64.9	78
2004	81	77.9	74.5	69.3	87
2003	82	79.9	75	70.	87
2002	79.0	74	72	67.3	71
2001	84	88	70	66.1	79
1999	84	76.9	79	68.3	78.7
2000	85	82	87.5	68.2	88

YEAR	X11	X22	X33	X44	X44
2012	65	77	86.7	63.5	85
2011	76	78	87.6	46.4	87
2010	75	79	87.6	64.1	87
2009	80	80	88.6	60.2	87.6
2008	85	82	87.5	65.3	88
2007	77	86	88.4	65.2	86
2006	76	77	80.1	66.3	76
2005	78	77.8	76.6	64.9	78
2004	81	77.9	74.5	69.3	87
2003	82	79.9	75	70.	87
2002	79.0	74	72	67.3	71
2001	84	88	70	66.1	79
1999	84	76.9	79	68.3	78.7
2000	85	82	87.5	68.2	88
1998	87	76.6	89	71.3	89.6

Year	X1	X2	X3	X4	X5
2012	64	65.2	67.9	79.5	65
2011	47	48.2	50.9	78.8	48
2010	65	66.2	68.9	78	66
2009	61	62.2	64.9	87	62
2008	66	67.2	69.9	89	67
2007	66	67.2	69.9	88	67
2006	67	68.2	70.9	77	68
2005	65.6	66.8	69.5	80	66.6
2004	70	71.2	73.9	76	71
2003	71	72.2	74.9	76	72
2002	68	69.2	71.9	78	69
2001	67	68.2	70.9	79	68
2000	69	70.2	72.9	69.8.4	70
1999	68.9	70.1	72.8	77.4	69.9
1998	72	73.2	75.9	87	73

X1	X2	X3	X4	X5
64	65.2	67.9	79.5	65
47	48.2	50.9	78.8	48
65	66.2	68.9	78	66
61	62.2	64.9	87	62
66	67.2	69.9	89	67
66	67.2	69.9	88	67
67	68.2	70.9	77	68
65.6	66.8	69.5	80	66.6
70	71.2	73.9	76	71
71	72.2	74.9	76	72
68	69.2	71.9	78	69
67	68.2	70.9	79	68
69	70.2	72.9	69.8.4	70
68.9	70.1	72.8	77.4	69.9
72	73.2	75.9	87	73

X1	X2	X3	X4	X5
64	65.2	67.9	79.5	65
47	48.2	50.9	78.8	48
65	66.2	68.9	78	66
61	62.2	64.9	87	62
66	67.2	69.9	89	67
66	67.2	69.9	88	67
67	68.2	70.9	77	68
65.6	66.8	69.5	80	66.6
70	71.2	73.9	76	71
71	72.2	74.9	76	72
68	69.2	71.9	78	69
67	68.2	70.9	79	68
69	70.2	72.9	69.8.4	70
68.9	70.1	72.8	77.4	69.9
72	73.2	75.9	87	73

R-codes

```
Ahmed=read.csv(file.choose(),header=T)
```

```
attach(ahmed)
```

Ahmed

```
X=Cbind(x1,x2,x3,x4,x5)
```

```
Y=cbind(x11,x22,x33,x44,x55)
```

```
t.test(x1,x11,)
```

```
t.test(x2, x22,)
```

```
t.test(x3, x33,)
```

```
t.testx4, x44,)
```

```
t.test(x5, x55).
```

Thanks.